



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

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

June 2, 2015

Exemption No. 11735  
Regulatory Docket No. FAA-2015-0854

Mr. Gregory S. Winton  
Attorney for Trihydro Corporation  
The Aviation Law Firm  
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Dear Mr. Winton:

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 March 26, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Trihydro Corporation (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial acquisitions and research.

See Appendix A for the petition submitted to the FAA describing the proposed operations and the regulations that the petitioner seeks an exemption.

The FAA has determined that good cause exists for not publishing a summary of the petition in the Federal Register because the requested exemption would not set a precedent, and any delay in acting on this petition would be detrimental to the petitioner.

#### **Airworthiness Certification**

The UAS proposed by the petitioner is an Altavian Nova R8400.

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<sup>1</sup>. 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, Trihydro Corporation 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.

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

## Conditions and Limitations

In this grant of exemption, Trihydro Corporation 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 Altavian Nova R8400 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.nts.gov](http://www.nts.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 May 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:  
TRIHYDRO CORPORATION  
FOR AN EXEMPTION SEEKING RELIEF FROM THE REQUIREMENTS OF  
TITLE 14 OF THE CODE OF FEDERAL REGULATIONS  
SECTIONS 61.113(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1),  
91.409(a)(1) & (a)(2), AND 91.417(a) & (b) CONCERNING COMMERCIAL  
OPERATION OF THE  
ALTAVIAN NOVA R8400 UNMANNED AIRCRAFT SYSTEM  
PURSUANT TO SECTION 333 OF  
THE FAA MODERNIZATION AND REFORM ACT OF 2012 (PUBLIC LAW 112-95)**

Submitted on March 26, 2015

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## **GLOSSARY OF ABBREVIATIONS**

AGL	Above Ground Level
AOI	Area of Interest
ATC	Air Traffic Control
ATO	Air Traffic Organization
AV	Aerial Vehicle
C.F.R.	Code of Federal Regulation
COA	Certificate of Authorization
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
GCS	Ground Control Station
LOL	Loss of Link
NAS	National Airspace System
NOTAM	Notice to Airmen
PIC	Pilot In Command
Section 333	FAA Modernization and Reform Act of 2012 (FMRA) Section 333
SOP	Standard Operating Procedures
UA	Unmanned Aircraft
UAS	Unmanned Aircraft System
VFR	Visual Flight Rules
VLOS	Visual Line of Sight
VMC	Visual Meteorological Conditions
VO	Visual Observer

## **SUMMARY**

Trihydro Corporation seeks exemption from the requirements of 14 C.F.R. §§ 61.113(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b), to operate an Unmanned Aircraft System pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (FMRA). This exemption will permit Trihydro Corporation to operate an Unmanned Aircraft System (UAS) for the commercial purpose of conducting aerial acquisitions and research within the National Airspace System (NAS).

## **INTRODUCTION AND INTERESTS OF THE PETITIONER**

Trihydro Corporation (hereinafter referred to as “Trihydro”), is an engineering and environmental consulting firm headquartered in Laramie, Wyoming. Trihydro Corporation has been in business since 1984 and tackles complex environmental engineering challenges with a core focus on specific markets such as: the petroleum industry, federal and state government projects, mining and natural resources, industrial and commercial operations, and infrastructure. Trihydro provides quality services, such as: air quality and process management, engineering and surveying, environmental management, water resources consulting, and data management to a diverse array of clients in both the public and private sectors.

As set forth in this Petition, Trihydro seeks to commercially operate its Altavian Nova R8400 UAS within the NAS for the purpose of conducting aerial acquisitions and research.

## **BACKGROUND**

### **Unmanned Aircraft System: Altavian Nova R8400 UAS**

Trihydro seeks an exemption to operate the Altavian Nova R8400 UAS for compensation or hire within the National Airspace System (“NAS”). The Nova R8400 UAS is comprised of a vertical takeoff and landing (VTOL) Unmanned Aircraft (UA) and a transportable Ground

Control Station (GCS). The Nova R8400 UA has a maximum gross weight of approximately 21.4 pounds, while having a diameter of 48 inches, rotorspan of 64 inches, and maximum speed of 16 mph. The Nova R8400 UA is equipped with eight propellers, each being driven by a Lithium Polymer battery powered electric motor.

The Nova R8400 UA will be registered in accordance with 49 U.S.C. 44103, Registration of Aircraft, as well as 14 C.F.R Part 47, Aircraft Registration, and marked in accordance with 14 C.F.R. Part 45, Identification and Registration Marking.



**Figure 1. The Nova 8400 UA**

### **BASIS FOR PETITION**

Petitioner, Trihydro Corporation, 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*, hereby petitions the Administrator to operate the Nova R8400 UAS within the National Airspace System (NAS), and for an exemption from the requirements of 14 C.F.R. §§ 61.113(a), 91.7(a),

91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b).

In consideration of the size, weight, speed, and limited operating area associated with the unmanned aircraft and its operation, the operation of the Nova R8400 UAS meets the conditions of Section 333 and will not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H.

Therefore, Trihydro requests relief from Sections 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), 91.417(a) & (b), as these sections set forth requirements for maintenance that only apply to aircraft with an airworthiness certificate.

Trihydro submits that the requested relief is proper since an equivalent level of safety will be ensured. Trihydro will use its technicians to perform maintenance, alterations, or preventive maintenance on the unmanned aircraft system using the methods, techniques, and practices prescribed in the manufacturer's maintenance manual. Furthermore, Trihydro will document and maintain all maintenance records for the Nova R8400 UAS.

Relief from certain requirements of Section 61.113(a), entitled *Private pilot privileges and limitations: Pilot in command*, is requested to the extent necessary to allow a Pilot in Command (PIC) holding a private pilot certificate and an airman medical certificate, and who has completed the Nova R8400 UAS training and currency requirements, to conduct the proposed UAS operations. Trihydro submits that the conditions and limitations set forth herein will ensure the safety of the NAS, as well as the safety of persons or property on the ground.

Trihydro seeks relief from Section 91.7(a), entitled *Civil aircraft airworthiness*, because the Nova R8400 UAS does not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H. As such, Trihydro submits that it will ensure that the Nova R8400 UAS is in

an airworthy condition, prior to every flight, by determining that the UAS is in compliance with the Nova R8400 UAS Operator Manual, the Nova Family of Systems Operations Manual, and the Nova R8400 UAS Maintenance Manual, and that the UA is in condition for safe flight.

Trihydro seeks relief from Section 91.119(c), entitled Minimum safe altitudes: (c) Over other than congested areas, because the Nova R8400 will be flown at an altitude at or under 400 feet AGL and to the extent that the Nova R8400 may be operated closer than 500 feet from persons, vessels, vehicles, and structures under certain conditions.

Trihydro also seeks an exemption from the requirements of Section 91.121, entitled *Altimeter Settings*, because the altitude reporting equipment of the Nova R8400 UAS is set to a pressure level of zero feet above ground level (AGL), rather than local barometric pressure or field altitude, before each flight. The altitude information of the Nova R8400 UA is provided to the PIC via a barometric pressure sensor, Global Positioning System (GPS) equipment, and a radio communications telemetry data link, which downlinks from the UA to the GCS for active monitoring of the flight path. A level of safety equivalent to Section 91.121 will be ensured as the altitude of the Nova R8400 UA will be reported to air traffic control (ATC) in feet AGL, and Trihydro will operate the Nova R8400 UA within visual line of sight, at or below 400 feet AGL.

Trihydro also seeks an exemption from the requirements of Section 91.151(a)(1), *Fuel requirements for flight in VFR conditions*. Trihydro submits that safety will not be affected by terminating flights of the battery powered Nova R8400 UA after 20 minutes of continuous operation, with 5 minutes remaining battery power (i.e., 20 percent).

In accordance with 14 C.F.R. § 11.81, Trihydro 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:

Trihydro Corporation  
1252 Commerce Drive  
Laramie, Wyoming 82070

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

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**B. The Specific Sections Of 14 C.F.R. From Which Trihydro Seeks Exemption.**

**1. Trihydro Seeks Exemption From The Requirements Of Section 61.113(a) And (b).**

Section 61.113, entitled *Private pilot privileges and limitations: Pilot in command*, subsections (a) prescribes the following, in part:

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

**2. Trihydro Seeks Exemption From The Requirements Of Section 91.7(a).**

Section 91.7, entitled *Civil aircraft airworthiness*, subsection (a), states the following:

(a) No person may operate a civil aircraft unless it is in an airworthy condition.

**3. Trihydro Seeks Exemption From The Requirements Of Section 91.119(c).**

Section 91.119(c), entitled *Minimum safe altitudes: (c) Over other than congested areas*, states the following, in part:

Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

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

**4. Trihydro Seeks Exemption From The Requirements Of Section 91.121.**

Section 91.121, entitled *Altimeter settings*, subsection (a), states the following, in relevant part:

(a) Each person operating an aircraft shall maintain the cruising altitude or flight level of that aircraft, as the case may be, by reference to an altimeter that is set, when operating--

(1) Below 18,000 feet MSL, to--

(i) The current reported altimeter setting of a station along the route and within 100 nautical miles of the aircraft;

(ii) If there is no station within the area prescribed in paragraph (a)(1)(i) of this section, the current reported altimeter setting of an appropriate available station; or

(iii) In the case of an aircraft not equipped with a radio, the elevation of the departure airport or an appropriate altimeter setting available before departure;

**5. Trihydro Seeks Exemption From The Requirements Of Section 91.151(a)(1).**

Section 91.151, entitled *Fuel requirements for flight in VFR conditions*, subsection (a)(1), states the following:

(a) No person may begin a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed--

(1) During the day, to fly after that for at least 30 minutes[.]

**6. Trihydro Seeks Exemption From The Requirement Of Section 91.405(a).**

Section 91.405, entitled *Maintenance required*, subsection (a), states the following:

Each owner or operator of an aircraft—



(a) Shall have that aircraft inspected as prescribed in subpart E of this part and shall between required inspections, except as provided in paragraph (c) of this section, have discrepancies repaired as prescribed in part 43 of this chapter[.]

**7. Trihydro Seeks Exemption From The Requirements Of Section 91.407(a)(1).**

Section 91.407, entitled *Operation after maintenance, preventive maintenance, rebuilding, or alteration*, subsection (a)(1), states the following:

(a) No person may operate any aircraft that has undergone maintenance, preventive maintenance, rebuilding, or alteration unless--

(1) It has been approved for return to service by a person authorized under § 43.7 of this chapter[.]

**8. Trihydro Seeks Exemption From The Requirements Of Sections 91.409(a)(1) And 91.409(a)(2).**

Section 91.409, entitled *Inspections*, subsection (a), states the following:

(a) Except as provided in paragraph (c) of this section, no person may operate an aircraft unless, within the preceding 12 calendar months, it has had --

(1) 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; or

(2) An inspection for the issuance of an airworthiness certificate in accordance with part 21 of this chapter.

**9. Trihydro Seeks Exemption From The Requirements Of Sections 91.417(a) And 91.417(b).**

Section 91.417, entitled *Maintenance records*, subsections (a) and (b), state the following:

(a) Except for work performed in accordance with §§ 91.411 and 91.413, each registered owner or operator shall keep the following records for the periods specified in paragraph (b) of this section:

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

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

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

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

(2) Records containing the following information:

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

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

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

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

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

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

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

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

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

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

**C. The Extent Of Relief Trihydro Seeks And The Reason Trihydro Seeks The Relief.**

**1. Extent Of Relief Trihydro Seeks And The Reason Trihydro Seeks Relief From Section 61.113(a).**

Relief from Section 61.113(a), entitled *Private pilot privileges and limitations: Pilot in command*, is requested to the extent necessary to allow a PIC holding a private pilot certificate and an airman medical certificate, and who has completed the Nova R8400 UAS training and currency requirements, to conduct the proposed UAS flight operations for compensation.

This relief is requested since the limitation set forth in Section 61.113(a) states that no person who holds a private pilot certificate may act as pilot in command of an aircraft that is carrying passengers or property for compensation or hire; nor may that person, for compensation or hire, act as pilot in command of an aircraft.

As set forth more fully below, Trihydro submits that an equivalent level of safety will be maintained because no PIC will be allowed to operate the Nova R8400 unless that PIC has met certain flight-hour and currency requirements, demonstrating that the PIC is able to safely operate the Nova R8400 UAS in a manner consistent with the operations specifications as set forth herein, including evasive and emergency maneuvers, as well as maintaining appropriate distances from people, vessels, vehicles and structures.

Further, Trihydro submits that the additional airmanship experience of a commercially certified pilot would not correlate to the airmanship skills necessary for the Trihydro's specific proposed operations.

**2. Extent Of Relief Trihydro Seeks And The Reason Trihydro Seeks Relief From Section 91.7(a).**

Relief from Section 91.7(a), entitled *Civil aircraft airworthiness*, is requested to the extent required to allow Trihydro to determine that the Nova R8400 UAS is in an airworthy

condition prior to every flight by ensuring that the UAS is in compliance with the Nova R8400 UAS Operator Manual, the Nova Family of Systems Operations Manual, and the Nova R8400 UAS Maintenance Manual, and that the UA is in condition for safe flight. Copies of the manuals, which contain proprietary information, are attached hereto as Exhibits A, B, and C, respectively, and are to be held in a separate file pursuant to 14 C.F.R. § 11.35(b) .

Trihydro seeks the requested relief because the Nova R8400 UAS does not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H. Therefore, Trihydro will ensure that the Nova R8400 UAS is in an airworthy condition based upon its compliance with the operating documents prior to every flight, and as stated in the conditions and limitations below.

**3.      Extent Of Relief Trihydro Seeks And The Reason Trihydro Seeks Relief From Section 91.119(c).**

Relief from Section 91.119(c), entitled *Minimum safe altitudes: (c) Over other than congested areas*, is required because all proposed operations of the Nova R8400 UAS will take place at an altitude at or below 400 feet AGL. The relief is requested since the limitations set forth in Section 91.119(c) state that no person may operate an aircraft below 500 feet above the surface. As set forth more fully below, Trihydro submits that a level of safety equivalent to Section 91.119(c) will be maintained because operations will be conducted in areas with controlled access and Trihydro will operate the Nova R8400 under the safety provisions contained within this petition and the Nova R8400 operating documents.

Additionally, relief from Section 91.119(c) is requested to the extent necessary to allow operations to be conducted closer than 500 feet to persons, vessels, vehicles, or structures. This relief is requested since the limitations set forth in Section 91.119(c) prohibit operating an aircraft closer than 500 feet to a person, vessel, vehicle, or structure. As set forth more fully

below, Trihydro submits an equivalent level of safety will be maintained because operations closer than 500 feet to a person, vessel, vehicle, or structure will first require that the operator receive permission from any nonparticipating persons or the person who owns/controls the property. In addition, barriers or structures will be in place to sufficiently protect nonparticipating persons from debris in the event of an accident and all nonparticipating persons will be required to remain under such protections for the duration of the operation.

**4. Extent Of Relief Trihydro Seeks And The Reason Trihydro Seeks Relief From Section 91.121.**

Relief from Section 91.121, entitled *Altimeter settings*, may be required to allow flight operations of the Nova R8400 UAS, because the Nova R8400 UA's altitude reporting equipment may be set on the ground to a pressure level of zero feet AGL, rather than local barometric pressure or field altitude, before each flight. The Nova R8400 UAS utilizes a barometric pressure sensor, GPS equipment, and a radio communications telemetry data link to downlink altitude information from the UA to the PIC at the ground control station (GCS).

Considering the limited altitude of the proposed operations, relief from 14 C.F.R. § 91.121 is sought to the extent necessary to comply with the applicable conditions and limitations stated below. As more fully set forth herein, a level of safety equivalent to Section 91.121 will be ensured as the altitude of the Nova R8400 UA will be reported to air traffic control (ATC) in feet above ground level (AGL), and Trihydro will operate the Nova R8400 UA within visual line of sight, at or below 400 feet AGL.

**5. Extent Of Relief Trihydro Seeks And The Reason Trihydro Seeks Relief From Section 91.151(a)(1).**

Relief from Section 91.151(a)(1) is requested to the extent required to allow flights of the battery powered Nova R8400 UA during daylight hours in visual flight rules (VFR) conditions to

continue for a total duration of 20 minutes, with 5 minutes of battery power remaining. Trihydro seeks the requested relief because without an exemption from Section 91.151(a)(1), the flight time duration of the battery powered Nova R8400 UA will be reduced to 5 minutes, which would eliminate the practicality of any aerial acquisition and research operations that Trihydro proposes to conduct pursuant to this Petition.

Significantly, as set forth below, the technical specifications of the Nova R8400 UAS, the Nova R8400 UAS operating documents, and Trihydro's proposed operating limitations, ensure that Trihydro will safely operate the battery powered Nova R8400 UA during daylight hours in VFR conditions for a total duration of 20 minutes, with 5 minutes of battery power remaining (i.e., 20 percent remaining).

**6. Extent Of Relief Trihydro Seeks And The Reason Trihydro Seeks Relief From Sections 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b).**

Since Sections 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b) only apply to aircraft with an airworthiness certificate, Trihydro requests relief from these Sections because the Nova R8400 UAS does not require an airworthiness certificate. As set forth more fully below, the Nova R8400 UAS meets the conditions of Section 333 for operation without an airworthiness certificate. Accordingly, Trihydro will use technicians to perform maintenance, alterations, or preventive maintenance on the unmanned aircraft system using the methods, techniques, and practices prescribed in the manufacturer's maintenance manual. Furthermore, Trihydro will document and maintain all maintenance records for the Nova R8400 UAS.

**D. The Reasons Why Granting Trihydro's Request Would Be In The Public Interest; That Is, How It Would Benefit The Public As A Whole.**

Granting the present Petition will further the public interest by allowing Trihydro to safely, efficiently, and economically perform aerial acquisitions and research within the NAS,

commercially, in support of government entities, mining and natural resources, industrial and commercial entities, the petroleum industry, and the country's infrastructure. Additionally, use of the Nova R8400 UAS will decrease congestion of the NAS, reduce pollution, and provide significant benefits to the economy. Notably, the benefits of the proposed operation of the Nova R8400 UAS will be realized without implicating any privacy issues.

**1. The Public Will Benefit From The Aerial Acquisition And Research Performed.**

Trihydro submits this Petition to commercially operate the Nova R8400 UAS and perform aerial acquisition and research within the NAS, in support of government entities, mining and natural resources, industrial and commercial entities, the petroleum industry, and the country's infrastructure. The Nova R8400 UAS will provide safe, efficient, and economical aerial acquisition and research operations to further each of these fields, all of which are critical to the well-being of the general public.

The specific operations that Trihydro will perform with the Nova R8400 UAS demonstrate how the requested exemption will directly benefit the above-referenced industries and the public. In operations involving infrastructure, the aerial acquisition performed by the Nova R8400 UAS will be used to preview possible sites for construction projects and provide precise topographic information about selected sites. In mining, natural resources, and the petroleum industry, the Nova R8400 UAS will be used to aid in facility inspections, surveying and planning new worksites, volumetric analysis, and performing right of way analysis. The Nova R8400 UAS will also further environmental management by aiding in identifying, developing, and transporting scarce water resources.

**2. The Public Will Benefit From Decreased Congestion Of The NAS.**

The Nova R8400 UA is battery powered and serves as a safe, efficient, and economical alternative to the manned aircraft traditionally utilized to obtain aerial imagery. By reducing the amount of manned aircraft needed to perform aerial acquisitions, an exemption allowing the use of a Nova R8400 UAS 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 Nova R8400 UA does not require an airport to takeoff or land. Likewise, a reduction of manned aircraft conducting aerial survey missions would result in fewer aircraft that must be handled by air traffic control during the ground, takeoff, departure, arrival, and landing phases of flight operations.

### **3. The Public Will Benefit From The Safety And Efficiency Of The Nova R8400 UAS.**

Conducting aerial acquisitions with the Nova R8400 UAS, instead of manned aircraft, will greatly benefit the public by drastically reducing the levels of air and noise pollution generated during traditional aerial survey flight operations. By using battery power and electric motors, the Nova R8400 UAS produces no air pollution, and is the most viable environmentally conscious alternative to the cabin class, six cylinder internal combustion twin engine aircraft that are typically utilized for aerial acquisitions, while burning approximately 20-30 gallons per hour of leaded aviation fuel. The Nova R8400 UA, while reducing the carbon footprint of aerial acquisitions, also eliminates noise pollution, as its battery powered electric motors are barely audible during the take-off phase, and cannot be heard when operating more than 100 feet above ground level.



By using the Nova R8400 UAS to perform aerial acquisitions, 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. Aside from the lack of aircrew members located onboard the aircraft, the Nova R8400 UA (weighing approximately 21.4 pounds at its maximum gross weight, with a diameter of 48 inches and a rotorspan of 64 inches, and with no fuel on board), has less physical potential for collateral damage to life and property on the ground, and in the air, compared to the manned aircraft that typically conduct aerial acquisitions (weighing 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 Acquisition Operations With The Nova R8400 UAS Will Benefit The Economy.**

In addition to being safe and efficient, the Nova R8400 UAS is also an economical alternative to using manned aircraft to conduct aerial acquisitions. As such, operation of the Nova R8400 UAS will allow United States based companies, like Trihydro, to remain competitive and contribute to growth of the U.S. economy. Specifically, with the rising 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. Operating the battery powered Nova R8400 UAS is one such technology that not only allows companies greater operational flexibility compared to manned aircraft, but provides such flexibility without the high operational cost of a traditional manned aircraft.

By operating the Nova R8400 UAS, companies such as Trihydro can remain competitive and profitable, and therefore provide greater job stability to employees and contractors, which will ultimately contribute to growth of the U.S. economy. Improved financial performance of

U.S. companies, through commercial use of the Nova R8400 UAS, provides a stable workforce that 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.

**5. There Are No Privacy Issues.**

Like the manned aerial acquisition flight operations that have been conducted for decades, the proposed operation of the Nova R8400 UAS will not implicate any privacy issues. Specifically, the Nova R8400 UAS will be operated in accordance with operating limitations set forth herein and the Federal Aviation Regulations, including the minimum altitude requirements of 14 C.F.R. § 91.119. Most significantly, the Nova R8400 UAS will not be operated closer than 500 feet to any person, vessel, vehicle, or structure, which is not directly involved in the operation unless certain conditions are met.

**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 Trihydro Seeks Exemption.**

**1. Reasons Why The Nova R8400 UAS Meets The Conditions Of The FAA Modernization and Reform Act of 2012 (FMRA) Section 333.**

In consideration of the size, weight, speed, and limited operating area associated with the unmanned aircraft and its operation, Trihydro's operation of the Nova R8400 UAS meets the conditions of FMRA Section 333, and will not require an airworthiness certificate in accordance with 14 C.F.R. Part 21, Subpart H.

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

*(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.*

In seeking this exemption, Trihydro submits that the Nova R8400 UAS can operate safely in the NAS pursuant to FMRA Section 333, as demonstrated by: (a) the characteristics of the Nova R8400 UAS; (b) the private pilot certification requirement; and (c) the specific operating limitations.

**a. The Specifications Of The Nova R8400 UAS Demonstrate Its Safe Characteristics.**

The Nova R8400 UAS 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, and operational capability.

**i. Technical Specifications Of The Nova R8400 UAS.**

Unmanned Aircraft System	The Nova R8400 is an Unmanned Aircraft System that is comprised of vertical takeoff and landing (VTOL) unmanned aircraft and a transportable ground control station.
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Unmanned Aircraft Dimensions	Diameter: 48 inches Rotorspan: 64 inches
Engine (Propulsive Unit)	<p><u>Engine (Propulsive Unit)</u>  (8) Altavian Inc. P/N : 30305 (Electric)  FAA Engine Type Cert: None  Propulsive Unit Type: 25V, 22 Amp Hour capacity, Lithium ion battery powered, direct drive electric motor</p> <p><u>Motor, Electric Sub-Assembly:</u>  Manufacturer: T-Motor  Model: MN4014  1.6 HP Peak Power Direct Drive  5.2 oz. Wt.</p> <p><u>Motor, Controller Sub-Assembly:</u>  Manufacturer: RCTimer  Model: NFS 45A  Type: Speed Controller  55 Amps Maximum  1.4 oz. Wt.</p> <p><u>Motor, Battery:</u>  Manufacturer: MaxAmps, Inc.  Type: 2(two) x Lithium Ion  11 Amp hour each  22.2V (nominal)</p>
Fuel	<p>Not Applicable.</p> <p>NOTE: The Nova R8400 UAS is powered by two Lithium Polymer rechargeable batteries, Altavian P/N 30142.</p>

Engine (Propulsive Unit) Limits	<p>Maximum Power Output: 1.6 HP  Maximum RPM: 8,316 RPM  Maximum Motor Temperature: 170 °F (77 °C)  NOTE: The motor temperature is not displayed to the operator.  Maximum motor, controller sub-assembly temperature: 194 °F (90 °C)</p> <p>Power On (Engine and Rotor Tach, neither visible to operator)  Maximum 8316 RPM  Minimum 3742 RPM</p>
Propeller and Propeller Limits	<p>(4) Altavian Inc. P/N 30490  FAA Propeller Type Certificate: None  Propeller Type: 2-blade, plastic, fixed pitch, tractor</p> <p><u>Propeller Sub-Assembly:</u>  Manufacturer: APC Propeller  Model: CAM 16x5.5MPR  Diameter (Nominal): 16 in.</p> <p>(4) Altavian Inc. P/N 30488  FAA Propeller Type Certificate: None  Propeller Type: 2-blade, plastic, fixed pitch, tractor</p> <p><u>Propeller Sub-Assembly:</u>  Manufacturer: APC Propeller  Model: CAM 16x5.5MR  Diameter (Nominal): 16 in.</p>
Battery Command & Control	2 (two) Nova Air Vehicle Batteries P/N 30142 power the motors, and battery command and control.
Airspeed Limits	Vne (Never Exceed Speed) 14.5 knots (7.5 m/s)
Empty Weight C.G. Range	-1 to 1 inches of datum
Datum	Centroid of Vehicle.

Maximum Weights	Ramp 21.4 lbs. Takeoff 21.4 lbs. Landing 21.4 lbs
Empty Weight	12.8 lbs.  NOTE: Empty Weight Excludes weight of battery and payload modules.
Frequencies	902-928 MHz (ISM Band) 2.4 GHz (ISM Band)  NOTE: FCC license is not required to utilize the above frequencies; uplink and downlink are on the 900Mhz band. If video is utilized, uplink, downlink, and video are all on 2.4 Ghz.
Computer Software	Avionics embedded processor, P/N 30306
Minimum Crew	(1) The Nova R8400 UAS can be operated by a single operator.
Number of Seats	(0) Not Applicable.
Fuel Capacity	Not Applicable.
Oil Capacity	Not Applicable.
Max. Operating Altitude	1,200 ft. AGL
Rotor Blade and Control Movements	Fixed Rotor Control. Vehicle control is achieved through varying thrust of each motor individually.
Nominal Endurance	25 minutes above 32 °F (0 °C)

	12 minutes below 32 °F (0 °C)
Ambient Outside Air Temperature (OAT)	Maximum OAT: 120 °F (49 °C) Minimum OAT At Altitude: -20 °F (-29 °C)
Wind Limitation	9.7 knots
Maintenance	This Nova R8400 UAS must be maintained in accordance with the manufacturer's maintenance manual, or later FAA accepted revision.

**ii. The Nova R8400 UAS Autonomous Flight And Navigation Modes Enable The UAS To Remain Within A Defined Operational Area.**

A complete description of the autonomous modes and methods of navigation for the Nova R8400 UAS is provided in the Nova R8400 UAS Operator Manual at pages 7-1 through 7-3. A copy of the Nova R8400 UAS Operator Manual, which contains proprietary information, is attached hereto as Exhibit A, and is to be held in a separate file pursuant to 14 C.F.R. § 11.35(b)<sup>1</sup>.

**iii. The Nova R8400 UAS Is Designed For Complete Autonomy From Launch To Landing Even In The Unlikely Event Of Loss Of The Control Link Or Navigation.**

Although a degradation or loss of the control link, and/or degradation or loss of the source of navigation, is unlikely, it is a situation that is well planned for and therefore, is a benign event. The Nova R8400 UA is designed for complete autonomy from launch to landing with a line of sight operator in the loop monitoring the airframe.

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<sup>1</sup> Exhibits to this Petition contain proprietary information, and in accordance with 14 C.F.R. § 11.35(b), are not to be included in the Federal Docket Management System (FDMS).

The Nova R8400 unmanned aircraft (UA) uses a two-stage failsafe approach for all avionics failure conditions, including the event of a loss of communications (“Lost Link”). Upon loss of the communication signal, the Nova R8400 UA will attempt to reacquire the link. If after 10 seconds the link has not been reacquired, the Nova R8400 UA will continue to attempt to reacquire the link while maintaining the current altitude and navigating to the home waypoint, which is the same as the location of the ground control station. Once at the home waypoint, the Nova R8400 UA will hover while continuing its attempt to reacquire the link for 30 seconds (to allow for rebooting of the ground control station, if needed). The Nova R8400 UA will then continue to attempt to re-acquire the link while it navigates through the landing procedure.

The landing procedure for Lost Link is identical to a normal landing procedure. The Nova R8400 UA will enter into a hover-land procedure; descending while reducing speed until contact with the ground. During this decent and touchdown, the Nova R8400 UA will remain in controlled flight.

Loss of GPS signal will result in a two-tiered recovery approach. Upon loss of a GPS signal, the Nova R8400 UA will immediately hover in an attempt to reacquire a signal. If after 15 seconds, a GPS signal is not reacquired, the UA will enter tier-two recovery. At any time during either tier-one or tier-two recovery, the operator can take over with augmented control and utilize its onboard magnetometer to navigate back to the home waypoint through dead-reckoning. During this failure mode, the observer will call out UA position and movement back to the operator. Once the UA is close enough to resolve orientation, or if operating with a live video payload, the operator can engage manual control and perform a manual landing at the pre-decided landing site.



If a cascade of failures has occurred and Lost-Link has also occurred during tier two, the Nova R8400 UA will enter into a hover-land procedure; descending while reducing speed until contacting the ground. During this decent and touchdown, the Nova R8400 UA is still in controlled flight.

The Nova R8400 UAS Operator Manual at Chapter 8 “Emergency Procedures” fully describes the features of the Nova R8400 UAS and sets forth the unmanned aircraft’s operation in the event of a power loss, loss of communications, loss GPS, loss of video link, or software crash. A copy of Nova R8400 UAS Operator Manual, which contains proprietary information, is attached hereto as Exhibit A, and is to be held in a separate file pursuant to 14 C.F.R. § 11.35(b).

**iv. The Nova R8400 Ground Control Station And Its Operation.**

The Nova R8400 Ground Control Station is identical to the GCS utilized by the Altavian Nova F6500 UAS, which has been granted exemptions to operate commercially in the NAS. See Exemption Nos. 11111, 11114, and 11188. A complete description of the operation and specifications of the ground control station (GCS) and flight control software for the Nova R8400 UAS is provided in the Nova R8400 UAS Operator Manual at Chapter 2. A complete overview of the features and operation of the GCS software is provided at Chapter 7. A copy of the Nova R8400 UAS Operator Manual, which contains proprietary information, is attached hereto as Exhibit A, and is to be held in a separate file pursuant to 14 C.F.R. § 11.35(b).

**v. Safe Mobile Operation Of The Nova R8400 UAS.**

The Nova R8400 UAS may be safely operated by a Pilot in Command (PIC) and safety observer co-located with a GCS on a mobile vehicle or watercraft, in order to efficiently perform aerial acquisition operations of large areas. As set forth in the Nova Family of Systems

Operations Manual at page 6-4, additional limitations and requirements apply to mobile operations of the Nova R8400 UAS, including the following:

The driver/operator of the vehicle must be licensed and fully understand his/her role in the operation.

The mobile vehicle must be organized and clear of any unnecessary debris prior to the operation.

Equipment and personnel positioning within the vehicle must be predetermined and agreed upon by the team. Each team member must use appropriate safety restraint equipment, and such equipment should not interfere with safe flight.

The PIC must have ready communication with the driver/operator of the vehicle as well as the safety observer.

GCS software must be configured for constant updating of GCS position on the map overlay, and the PIC must be kept aware of vehicle position. The GCS must be mounted or fixed to the vehicle to ensure that no excess movement will shift the GCS during operations.

The route of the moving vehicle must be determined prior to operation and the PIC must ensure that no part of the route will obscure the safety observer's view of the vehicle or cause any physical obstacles or obstructions to any member of the flight team.

The Area of Interest (AOI) must be large enough to warrant mobile operations, and the aircraft cannot be allowed to exit the AOI under any circumstance. The only change to the standard operating procedures (SOP's) with mobile operations must be an update of the LOL (Loss of Link) site. Mobile operations are only permitted if suitable LOL sites are within 500 ft. of the PIC at all times. The entire AOI must also meet the "sterile environment" of a static site as described on page 4-4 of the Operations Manual, otherwise mobile operations are prohibited.

A copy of the Nova Family of Systems Operations Manual, which contains proprietary information, is attached hereto as Exhibit B, and is to be held in a separate file pursuant to 14 C.F.R. § 11.35(b).

- b. Flight Operations Of The Nova R8400 UAS Are Limited To The Line Of Sight Of A Certificated Private Pilot in Command With A Safety Observer.**

Trihydro will only utilize certificated Private Pilots who possess a valid airman medical certificate to act as a pilot in command of the Nova R8400 UAS. Additionally, a safety observer will assist all pilots during flight operations. Additionally, both the pilot in command and safety observer must complete the Nova Operators Course and meet the experience requirements as set forth in the Nova Family of Systems Operations Manual. A copy of the Nova Family of Systems Operations Manual, which contains proprietary information, is attached hereto as Exhibit B, and is to be held in a separate file pursuant to 14 C.F.R. § 11.35(b).

**c. Flights Will Be Conducted Pursuant To Specific Operating Limitations.**

In seeking this exemption, Trihydro proposes to commercially operate the Nova R8400 UAS for the special purpose of conducting aerial acquisitions within the NAS, pursuant to the following specific operating limitations:

1. Operations authorized by this grant of exemption are limited to the following aircraft described in the operating documents, which is the Altavian Nova R8400 Unmanned Aircraft System, an octo-rotor aircraft weighing approximately 21.4 pounds at maximum gross weight. Proposed operations of any other aircraft will require a new petition or a petition to amend this grant.
2. UAS operations under this exemption are limited to conducting operations for the purpose of aerial acquisitions.
3. The UA may not be flown at an indicated airspeed exceeding 13.9 knots (i.e., 16 mph).
4. The UA must be operated at an altitude of no more than 400 feet above ground level (AGL), as indicated by the procedures specified in the operating documents. All altitudes reported to ATC must be 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.
6. All operations must utilize a visual observer (VO). 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.

7. The VO must not perform any other duties beyond assisting the PIC with seeing and avoiding other air traffic and other ground based obstacles/obstructions and is not permitted to operate the camera or other instruments.

8. The operating documents and this grant of exemption 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 contained in the grant of exemption 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 upon request. The operator must also present updated and revised documents if it petitions for extension or amendment to the grant of exemption. If the operator determines that any update or revision would affect the basis upon which the FAA granted the exemption, then the operator must petition for amendment to the 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.

9. Prior to each flight the PIC must inspect the UAS to ensure it is in a condition for safe flight. 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. The Ground Control Station must be included in the preflight inspection. All maintenance and alterations must be properly documented in the aircraft records.

10. 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 in accordance with the operating documents. The PIC who conducts the functional test flight must make an entry in the UAS aircraft records of the flight.

11. The pre-flight inspection must account for all potential discrepancies, i.e. inoperable components, items, or equipment, not already covered in the relevant preflight inspection sections of the operating documents.

12. The operator must follow the UAS manufacturer's aircraft/component, maintenance, overhaul, replacement, inspection, and life limit requirements, with particular attention to flight critical components that may not be addressed in the manufacturer's manuals.

13. The operator must carry out its maintenance, inspections, and record keeping requirements, in accordance with the operating documents. Maintenance, inspection, alterations, and status of replacement/overhaul component parts must be noted in the

aircraft records, including total time in service, description of work accomplished, and the signature of the authorized person returning the UAS to service.

14. Each UAS operated under this exemption must comply with all manufacturer Safety Bulletins.

15. The authorized person must make an entry in the aircraft record of the corrective action taken against discrepancies discovered between inspections.

16. The PIC must possess at least a private pilot certificate and at least a current third-class medical certificate for all flight operations. The PIC must also meet the flight review requirements specified in 14 C.F.R. § 61.56 in an aircraft in which the PIC is rated on his or her pilot certificate.

17. Prior to operations, the PIC must have completed the operator's training and currency requirements as prescribed in the operating documents. During that training, the PIC must have accumulated and logged, in a manner consistent with 14 CFR § 61.51(b), the minimum hours prescribed in the operating documents for a UAS pilot operating the make and model of the UAS to be utilized for operations under the exemption. Training, proficiency, and experience-building flights can be conducted under this grant of exemption to qualify the operator's PIC(s), VO(s) and other essential personnel as defined in the operating documents. However, said training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights the PIC is required to operate the UA with appropriate distances in accordance with 14 CFR § 91.119.

18. The operator may not permit any PIC to operate unless that PIC has demonstrated through the operator's training and currency requirements that the PIC is able 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 people, vessels, vehicles and structures.

19. UAS operations may not be conducted during night, as defined in 14 C.F.R. § 1.1. All operations must be conducted under visual meteorological conditions (VMC). Flights under special visual flight rules (SVFR) are not authorized.

20. The UA may not operate within 5 nautical miles of an airport reference point as denoted on a current FAA-published aeronautical chart unless a letter of agreement with that airport's management is obtained, and the operation is conducted in accordance with a NOTAM as required by the operator's COA. The letter of agreement with the airport management must be made available to the Administrator upon request.

21. 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.

22. If the UA loses communications or loses its GPS signal, it must return to a pre-determined location within the planned operating area and land or be recovered in accordance with the operating documents.
23. The PIC must abort the flight in the event of unpredicted obstacles or emergencies in accordance with the operating documents.
24. The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough power to fly at normal cruising speed to the intended landing point and land the UA with 20% battery power remaining.
25. The operator must obtain an Air Traffic Organization (ATO) issued Certificate of Waiver or Authorization (COA) prior to conducting any operations under the grant of exemption. This COA will also require the operator to request a Notice to Airmen (NOTAM) not more than 72 hours in advance, but not less than 48 hours prior to the operation. All operations shall be conducted in accordance with airspace requirements in the ATO issued COA including class of airspace, altitude level and potential transponder requirements.
26. All aircraft operated in accordance with the exemption must be identified by serial number, registered in accordance with 14 C.F.R. part 47, and have identification (N-Number) markings in accordance with 14 C.F.R. part 45, Subpart C. Markings must be as large as practicable.
27. Before conducting operations, the radio frequency spectrum used for operation and control of the UA must comply with the Federal Communications Commission (FCC) or other appropriate government oversight agency requirements.
28. The documents required under 14 C.F.R. §§ 91.9 and 91.203 must be available to the PIC at the location of the Remote Controller of the UAS any time the UAS is operating. These documents must be made available to the Administrator or any law enforcement official upon request.
29. The UA must remain clear and yield the right of way to other aviation operations and activities at all times.
30. If the UAS is operated from a moving vehicle or device, the operation must be in accordance with the operating documents.
31. The UA may not be operated over congested or densely populated areas.
32. Flight operations must be conducted at least 500 feet from all nonparticipating persons (persons other than the PIC, VO, operator trainees or essential 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 and/or;

b. The aircraft is operated near vessels, vehicles or structures where the owner/controller of such vessels, vehicles or structures has granted permission 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, and;

c. Operations nearer to the PIC, VO, operator trainees or essential persons do not present an undue hazard to those persons per § 91.119(a).

33. All operations shall be conducted over private or controlled-access property with permission from the land owner/controller or authorized representative. Permission from the land owner/controller or authorized representative will be obtained for each flight to be conducted.

34. 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.nts.gov](http://www.nts.gov).

**2. Reasons Why An Exemption From The Requirements Of Section 61.113(a) Would Not Adversely Affect Safety.**

Trihydro submits that an equivalent level of safety established by Section 61.113(a) will be maintained because no PIC will be allowed to operate the Nova R8400 UAS unless that PIC has demonstrated, through the Nova R8400 UAS training and currency requirements, that the PIC is able to safely operate the Nova R8400 UAS in a manner consistent with this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from people, vessels, vehicles and structures.

Considering Trihydro's proposed area of operations and the operating limitations set forth-above; the parallel nature of private pilot aeronautical knowledge requirements to those of commercial pilot requirements (*See* Exemption No. 11062); and the airmanship skills necessary

to safely operate the Nova R8400 UAS, Trihydro submits that the additional manned airmanship experience of a commercially certificated pilot would not correlate to the airmanship skills necessary for Trihydro's specific proposed flight operations.

Additionally, the FAA has previously granted relief from Section 61.113(a), specific to UAS, in circumstances similar, in all material respects, to those presented herein (e.g. Exemption Nos. 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11110, 11112, 11136, 11138, 11150, 11153, 11156, 11158, 11159, 11160, 11161, 11170, 11171, 11172, 11174, 11176, 11177, 11178, 11185, 11188, 11189, 11191, 11192, 11193, 11194, 11195, 11204, 11206, 11208, 11209).

Trihydro will not allow any PIC to operate the Nova R8400 UAS unless that PIC has demonstrated through the Nova R8400 UAS training and currency requirements that the PIC is able to safely operate the Nova R8400 UAS in a manner consistent with this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from people, vessels, vehicles and structures.

A complete description of the Nova R8400 UAS Training and Qualification requirements is set forth at pages 3-5 through 3-6 of the Nova Family of Systems Operations Manual, attached hereto as Exhibit B. Exhibit B contains proprietary information and is to be held in a separate file pursuant to 14 C.F.R. § 11.35(b).

### **3. Reasons Why An Exemption From The Requirements Of Section 91.7(a) Would Not Adversely Affect Safety.**

The level of safety established by Section 91.7(a) will be maintained because prior to every flight, Trihydro will ensure that the Nova R8400 UAS is in an airworthy condition and safe for flight based upon the Nova R8400 UAS's compliance with its operating documents (i.e., the Nova R8400 UAS Operator Manual, the Nova Family of Systems Operations Manual, and



the Nova R8400 UAS Maintenance Manual) and as stated in the conditions and limitations herein.

Additionally, the FAA has previously granted relief from Section 91.7(a), specific to UAS, in circumstances similar, in all material respects, to those presented herein (e.g. Exemption Nos. 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11110, 11112, 11136, 11138, 11150, 11153, 11156, 11157, 11158, 11159, 11160, 11161, 11166, 11167, 11170, 11171, 11172, 11174, 11177, 11178, 11185, 11188, 11189, 11191, 11192, 11193, 11194, 11195, 11204, 11206, 11208, 11209).

**4. Reasons Why An Exemption From The Requirements Of Section 91.119(c) Would Not Adversely Affect Safety.**

The equivalent level of safety established by Section 91.119(c) will be maintained because in any operation to be conducted closer than 500 feet from any nonparticipating persons, barriers or structures will be present to sufficiently protect any nonparticipating persons from debris in the event of an accident during operation of the Nova R8400 UA, which weighs less than twenty-two (22) pounds and will be operated below an altitude of 400 feet AGL. The nonparticipating persons will be required to remain in the area of protection, and if any nonparticipating person leaves the area of protection and is within 500 feet of the Nova R8400, flight operations would cease immediately.

Additionally, any operation to be conducted closer than 500 feet from persons, vessels, vehicles, and structures would first require the permission of the land owner/controller and a safety assessment of the risk of operating closer to those objects by the PIC.

The FAA has previously granted relief from Section 91.119(c) specific to UAS, in circumstances similar, in all material respects, to those presented herein (e.g. Exemption Nos. 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11110, 11111, 11112, 11114, 11136,

11138, 11150, 11153, 11156, 11157, 11158, 11159, 11160, 11161, 11166, 11167, 11170, 11171, 11172, 11174, 11176, 11177, 11178, 11184, 11185, 11188, 11189, 11191, 11192, 11193, 11194, 11195, 11204, 11206, 11208, 11209).

**5. Reasons Why An Exemption From The Requirements Of Section 91.121 Would Not Adversely Affect Safety.**

The equivalent level of safety established by Section 91.121 will be maintained because the altitude of the Nova R8400 UA will be reported to air traffic control (ATC) in feet above ground level (AGL), and Trihydro will operate the Nova R8400 UA within visual line of sight, at or below 400 feet AGL. Furthermore, the altitude information of the Nova R8400 UA will be provided to the PIC via a barometric pressure sensor, GPS equipment and a radio communications telemetry data link, which downlinks from the UA to the GCS for active monitoring of the flight path and altitude. Prior to each flight, a zero altitude initiation point is established at ground level.

The FAA has previously granted relief from Section 91.121 specific to UAS, in circumstances similar, in all material respects, to those presented herein (e.g. Exemption Nos. 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11112, 11136, 11138, 11150, 11153, 11156, 11157, 11158, 11159, 11160, 11161, 11166, 11167, 11170, 11171, 11174, 11176, 11177, 11178, 11185, 11188, 11189, 11191, 11192, 11193, 11194, 11195, 11204, 11206, 11208, 11209).

**6. Reasons Why An Exemption From The Requirements Of Section 91.151(a)(1) Would Not Adversely Affect Safety.**

A grant of this exemption would ensure the level of safety established by 14 C.F.R. Section 91.151(a)(1) because the technical specifications of the Nova R8400 UAS, the Nova Operations Manual, and Trihydro's proposed operating limitations ensure that Trihydro may

safely operate the battery powered Nova R8400 UA during daylight hours in VMC for 20 minutes, landing with 5 minutes of battery power remaining. Furthermore, previous exemptions granted by the FAA concerning Section 91.151(a)(1) establish that safety is not adversely affected when the technical characteristics and operating limitations of a UAS are considered.

The Nova R8400 UA is powered by two Lithium Ion 11 Amp hour, 22.2V battery, and is protected by two low battery failsafes, while the ground control station (GCS) provides a battery indicator on the heads-up display, which indicates the Nova R8400 UA's current remaining battery power measured in volts, providing the PIC with constant awareness of the real-time battery voltage during a flight.

The two low battery failsafes that protect the Nova R8400 UA are a "Low AV<sup>2</sup> battery" failsafe and a "Critically low AV battery" failsafe. The "Low AV battery" failsafe flies the UA to the location of the ground control station (GCS), or identified Rally point, when the UA battery reaches a certain threshold of time as configured by the operator (or 22.2V). The "Critically low AV battery" shuts the propulsion motor off and lands the UA at its current location. This failsafe is triggered if the battery drops below the critical battery voltage as configured by the operator (or 21.2V).

Furthermore, an exemption from the requirements of Section 91.151(a)(1) would not adversely affect safety because Trihydro will only conduct flights during daylight hours in VMC, with the duration of each flight not to exceed 20 minutes, with 5 minutes battery power remaining.

Likewise, as set forth above, Trihydro has proposed specific operating limitations in this Petition that will maintain the level of safety established by Section 91.151(a)(1), including the

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<sup>2</sup> The Nova R8400 UAS Operator Manual defines "AV" as "Aerial Vehicle."

following: (1) the Nova R8400 UA will only be operated 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); (2) Nova R8400 UA will only be operated pursuant to visual flight rules (VFR) in visual meteorological conditions (VMC); and (3) the duration of each flight shall not exceed 20 minutes.

Significantly, previous exemptions granted by the FAA concerning Section 91.151(a)(1) establish that safety is not adversely affected when the technical characteristics and operating limitations of the UAS are considered. Relief has been granted for manned aircraft to operate at less than the minimums prescribed in Section 91.151(a), including Exemption Nos. 2689, 5745, and 10650. Moreover, the FAA has previously granted relief from Section 91.151, specific to UAS, in circumstances similar, in all material respects, to those presented herein (e.g. Exemption Nos. 8811, 10808, 10673, 11042, 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11110, 11136, 11138, 11150, 11153, 11156, 11157, 11158, 11159, 11160, 11161, 11166, 11167, 11170, 11171, 11172, 11174, 11176, 11177, 11178, 11185, 11188, 11189, 11191, 11192, 11193, 11194, 11195, 11204, 11206, 11208, 11209).

**7. Reasons Why An Exemption From The Requirements Of Sections 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), And 91.417(a) & (b) Would Not Adversely Affect Safety.**

In seeking this exemption, Trihydro submits that the level of safety with regard to the regulatory maintenance and alteration requirements established by Sections 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), 91.417(a) & (b) will be met because Trihydro, will use its trained technicians to perform maintenance, alterations, or preventive maintenance on the unmanned aircraft system using the methods, techniques, and practices prescribed in the

manufacturer's maintenance manual. Furthermore, Trihydro will document and maintain all maintenance records for the Nova R8400 UAS.

Since the Nova R8400 UAS will be inspected as prescribed by the manufacturer's maintenance manual, Trihydro will maintain the level of safety established by Sections 91.405(a), 91.409(a)(1), and 91.409(a)(2). The Nova R8400 Maintenance Manual sets forth Scheduled Maintenance Inspection Procedures for each system and component. Inspection intervals for the Nova R8400 UAS include preflight and post flight inspections, as well as scheduled inspections every 25 hours, 50 hours, 75 hours, and 100 hours.

Likewise, the exemption sought will not adversely affect safety because Trihydro will perform maintenance, alterations or preventive maintenance on the unmanned aircraft system using the methods, techniques, and practices prescribed by the manufacturer's maintenance manual. The Nova R8400 Maintenance Manual details procedures for each component of the unmanned aircraft, including the components of the propulsion system, legs/arms, avionics system, and payload system.

A copy of the Nova R8400 Maintenance Manual, which contains proprietary information, is attached hereto as Exhibit C, and is to be held in a separate file pursuant to 14 C.F.R. § 11.35(b).

Furthermore, the exemption sought would maintain the level of safety established by Sections 91.407, 91.417(a) and 91.417(b) because all maintenance of the Nova R8400 UAS will be performed by Altavian trained technicians, who will document and maintain maintenance records for the Nova R8400 UAS. Altavian trained technicians are qualified to conduct any and all maintenance to ensure the safe operation of the Nova family of UAS, conduct all service inspections, and authorize the use of each vehicle in the Nova family of UAS based upon

completion of appropriate inspections. *See* Nova Family of Systems Operations Manual, Exhibit B, at page 3-4. Pursuant to the Nova Family of Systems Operations Manual and the Nova R8400 Maintenance Manual, a Maintenance Action Form must be completed and saved in the maintenance logs for all maintenance that is performed on the UAS. The procedures for maintaining the maintenance logs for the UAS are fully set forth in the Nova Family of Systems Operations Manual, Exhibit B, at Chapter 5, and the Nova R8400 Maintenance Manual, Exhibit C, at Chapter 4.

Significantly, previous exemptions granted by the FAA concerning Sections 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), 91.417(a) & (b) establish that safety is not adversely affected when the technical characteristics and operating limitations of a UAS are considered. The FAA has previously granted relief specific to UAS in circumstances similar, in all material respects, to those presented herein (e.g. Exemption Nos. 11062, 11063, 11064, 11065, 11066, 11067, 11080, 11109, 11110, 11112, 11136, 11138, 11150, 11153, 11156, 11157, 11158, 11159, 11160, 11161, 11166, 11167, 11170, 11171, 11172, 11174, 11176, 11177, 11178, 11185, 11188, 11189, 11191, 11192, 11193, 11194, 11195, 11204, 11206, 11208, 11209).

#### **8. The FAA May Prescribe Any Other Conditions For Safe Operation.**

In accordance with Section 333 of the FAA Modernization and Reform Act of 2012 (FMRA) and 14 C.F.R. § 21.16 entitled *Special Conditions*, Trihydro requests that the FAA prescribe special conditions for the intended operation of the Nova R8400 UAS, which contain such safety standards that the Administrator finds necessary to establish a level of safety equivalent to that established by 14 C.F.R. Part 21, Subpart H, and 14 C.F.R. §§ 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b). Such special conditions will permit safe operation of the unmanned aircraft for the limited purpose of conducting aerial acquisitions within the NAS. FMRA Section 333 sets forth the requirements for considering

whether a UAS will create a hazard to users of the NAS or the public, or otherwise pose a threat to national security; and further, provides the authority for such UAS to operate without airworthiness certification in accordance with any requirements that must be established for the safe operation of the aircraft systems in the NAS.

Likewise, the Administrator may prescribe special conditions pursuant to 14 C.F.R.

§ 21.16, for operation of the Nova R8400 UAS, since 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.

Therefore, in accordance with FMRA Section 333 and 14 C.F.R. § 21.16, the FAA may prescribe special conditions for Trihydro's intended operation of the Nova R8400 UAS, which contain such safety standards that the Administrator finds necessary to establish a level of safety equivalent to that established by 14 C.F.R. Part 21, Subpart H, and 14 C.F.R. Sections 61.113(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b).

**F. A Summary That Can Be Published In The *Federal Register*, stating:**

**The Rules From Which Trihydro Seeks Exemption:**

*Trihydro Corporation seeks exemption from the requirements of 14 C.F.R. Sections 61.113(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b).*

**A Brief Description Of The Nature Of The Exemption Trihydro Seeks:**

*This exemption will permit Trihydro Corporation to commercially operate an Unmanned Aircraft System (UAS) for the purpose of conducting aerial acquisitions and research within the National Airspace System (NAS).*

**G. Any Additional Information, Views, Or Arguments Available To Support Trihydro's Request.**

This Petition is made pursuant to the FAA Modernization and Reform Act of 2012 (FMRA) Section 333, which directs the Secretary of Transportation to determine if certain UAS may operate safely in the NAS. As such, Trihydro's request for exemption may be granted pursuant to the authority of FMRA Section 333 and 14 C.F.R. Part 11, as set forth above.

FMRA Section 333 sets forth the requirements for considering whether a UAS will create a hazard to users of the NAS or the public, or otherwise pose a threat to national security; and further, provides the authority for such UAS to operate without airworthiness certification.

As discussed in detail above, the Nova R8400 UAS 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.

**CONCLUSION**

As set forth herein, Trihydro seeks an exemption pursuant to 14 C.F.R. § 11.61 and Section 333 of the FAA Modernization and Reform Act of 2012 (FMRA), which will permit safe operation of the Nova R8400 UAS commercially, without an airworthiness certificate, for the limited purpose of conducting aerial acquisitions within the National Airspace System (NAS). 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 Trihydro to safely, efficiently, and economically operate the Nova R8400 UAS commercially within the NAS.



**WHEREFORE**, in accordance with the Federal Aviation Regulations and the FAA Modernization and Reform Act of 2012, Section 333, Trihydro respectfully requests that the Administrator grant this Petition for an exemption from the requirements of 14 C.F.R. Sections 61.113(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) & (a)(2), and 91.417(a) & (b), and permit Trihydro to operate the Nova R8400 UAS for the purpose of conducting aerial acquisitions and research within the NAS.

Dated: March 26, 2015

Respectfully submitted,

**The Aviation Law Firm**

*/s/ Gregory S. Winton*

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