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

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

May 21, 2015

Exemption No. 11638
Regulatory Docket No. FAA–2015–0598

Mr. Seth LeMaster
Project Manager
BNL Technical Services, LLC
3250 Port of Benton Boulevard, Suite D
Richland, WA 99354

Dear Mr. LeMaster:

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 posted March 10, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of BNL Technical Services, LLC (hereinafter petitioner or operator) for an exemption. The exemption would allow the petitioner to operate an unmanned aircraft system (UAS) to conduct aerial imaging for surveying and monitoring.

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

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

Airworthiness Certification

The UAS proposed by the petitioner are the DJI Phantom 2 and DJI S1000.

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

The Basis for Our Decision

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

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

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

Our Decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 106(f), 40113, and 44701, delegated to me by the Administrator, BNL Technical Services, LLC is granted an exemption from 14 CFR §§ 61.23(a) and (c), 61.101(e)(4) and (5), 61.113(a), 61.315(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b), to the extent necessary to allow the petitioner to operate a UAS to perform aerial data collection. This exemption is subject to the conditions and limitations listed below.

Conditions and Limitations

In this grant of exemption, BNL Technical Services, LLC is hereafter referred to as the operator.

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

1. Operations authorized by this grant of exemption are limited to the DJI Phantom 2 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 5 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 May 31, 2017, unless sooner superseded or rescinded.

Sincerely,

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

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a Service-Disabled Veteran-Owned Small Business

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

Re: Exemption Request Section 333 of the FAA Reform Act.

Dear Sir or Madam:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 ("Reform Act") and 14 C.F.R. Part 11 BNL Technical Services, LLC ("BNL"), hereby applies for an exemption from the Federal Aviation Regulations (FARs) identified below, to allow commercial operation of our small unmanned aerial vehicles (sUAVs) for aerial imaging for surveying and monitoring of secured and controlled environments, so long as such operations are conducted within and under the conditions outlined herein or as may be established by the FAA as required by Section 333.

As detailed in this document and the attached Flight Manual, the requested exemption would permit the operation of sUAVs under controlled conditions in airspace that is 1) limited, 2) predetermined, 3) controlled as to access, and 4) would provide safety enhancements to the already best practices safety protocols followed by BNL at each one of its construction sites. As described more fully below, the requested exemption would permit the operation of sUAVs by the applicant for commercial use that would provide the following benefits:

1. Operations would be performed in an area of operation limited in size suitable to the specific use, in advance of flight.
2. The flight would be planned in advance to minimize hazards to persons and property in the air and on the ground.
3. The operator would reasonably limit or control access to provide safety to those not involved in the operation.
4. Operation of a sUAVs would provide significant safety, environmental and other enhancements not possible by larger sized aircraft.
5. An FAA licensed airman with a private pilot certificate would operate the sUAVs or directly supervise the operation.
6. Provide a beneficial and currently unavailable service to government organizations and the general public that would serve the public interest.

Approval of this exemption would thereby enhance safety and fulfill the Secretary of Transportation's (the FAA Administrator's) responsibilities to "...establish requirements for the safe operation of such aircraft systems in the national airspace system." Section 333(c) of the Reform Act.

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BNL Technical Services, LLC (BNL) is a CVE-certified Service-Disabled Veteran-Owned Small Business that offers contract labor, energy services and managed tasks services and intends to offer aerial imagery services pending approval of this exemption request. Incorporated and headquartered in the State of Washington, since 1999 BNL Tech has an established and documented record of successfully meeting the needs of our clients. The BNL Tech management team has extensive and proven experience working within federal, state and local governmental guidelines, directives, instructions and policies supporting commercial and government projects.

BNL intends to use sUAVs in support of our current contract with Washington River Protection Solutions BMA 49896 (see attachment A) for subsurface investigations (ground scanning), civil surveying, and dome deflection surveying services. Washington River Protection Solutions (WRPS) is the Tank Operations Contractor (TOC) at the Hanford site and these services are needed in support of WRPS' prime contract with the U.S Department of Energy. The TOC operates and manages the Hanford 200 Area Tank Farm facilities for the U.S. Department of Energy-Office of River Protection (ORP).

Accurate crane route maps are required to safely move and place cranes within tank farm boundaries. A discrepancy in a crane route map identified a need to update tank farm route maps. Conventional land surveying or laser scan surveys may be required to verify actual field conditions. Other general purpose surveys may be necessary such as transfer line location and valve pit jumper location. This requires work in both radiological zones and non-radiological zones.

This is a secure site and all personnel require DOE security clearance to obtain badges for site access. Only authorized personnel are allowed at the site where strict safety protocols are followed.

First, BNL seeks an exemption to perform video filming and photographing by air for land surveying at the Tank Farms in order to provide WRPS with real time survey data and images of current site conditions. Satellite images are typically out dated as conditions can change on a weekly bases due to active construction and the cost and dangers involved in utilizing aircraft outweigh their benefit.

Second, BNL intends to employ sUAVs to inspect equipment, commercial and industrial structures and property at the Tank Farms. Some of this equipment is located inside radiological zones where strict safety requirements are followed. Utilizing our sUAVs under strict supervision of DOE personnel would limit the exposure and cost of personnel entering a radiological area to perform a visual inspection.

Specifically, BNL intends to use sUAVs which are equipped with cameras, in order to engage in the following commercial activities:

(a) Video filming by air and photographing to support professional operations in engineering, land surveying, architecture and other related professional activities involved at the Hanford site.

(b) Inspections by air of infrastructure such as electrical installations, equipment, pipes, and structures. These inspections will only be done under contract with WRPS and DOE.

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This exemption request is made based on the usage information outlined in this petition, as well as the accompanying BNL Pilot Operating Handbook Phantom 2 (attachment B), BNL Pilot Operating Handbook DJI S1000 (attachment C) as well as the DJI Phantom 2 users manual (attachment D) and the DJI S1000 users manual (attachment E). The DJI Phantom 2 sUAV was selected because it has a proven capability for controlled flight, a gyro stabilized flight mode, GPS aided navigation, a compass, blinking LED's on the bottom, a failsafe mode for returning home, and prop guards. The DJI S1000 UAV was selected because it has a proven capability for controlled flight, a gyro stabilized flight mode, GPS aided navigation, a compass, and a failsafe mode for returning home. These devices are offered for general sale to the public around the world and have often been used as Model Radio Controlled Aircraft enthusiasts throughout the USA.

The name and address of the applicant is:

BNL Technical Services, LLC.
Seth LeMaster, Project Manager
PH: 509-371-2570
Email: Seth@BNLtech.com
Address: 3250 Port of Benton Blvd, Richland, WA 99354

Regulations from which the exemption is requested: 14 C.F.R. Part 21, 14 C.F.R. 45.23(b), 14 C.F.R. 61.113 (a) & (b), 14 C.F.R. 91.7 (a), 14 C.F.R. 91.9 (b) (2), 14 C.F.R. 91.103, 14 C.F.R. 91.109, 14 C.F.R. 91.119, 14 C.F.R. 91.121, 14 C.F.R. 91.151 (a), 14 C.F.R. 91.203 (a) (1), 14 C.F.R. 91.405 (a), 14 C.F.R. 407 (a) (1), 14 C.F.R. 409 (a) (2), 14 C.F.R. 417 (a) & (b)

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I. STATUTORY AUTHORITY FOR EXEMPTIONS

The Federal Aviation Act expressly grants the FAA authority to issue exemptions. This statutory authority includes exempting civil aircraft, as the term is defined under §40101 of the Act, including sUAVs, from the requirement that all civil aircraft must have a current airworthiness certificate.

The Administrator may grant an exemption from a requirement of a regulation prescribed under subsection (a) or (b) of this section or any sections 44702-44716 of this title if the Administrator finds the exemption in the public interest. 49 U.S.C. §44701(f) See also 49 USC §44711(a); 49 USC §44704; 14 CFR §91.203(a)(1).

Section 333(b) of the Reform Act assists the Secretary in determining whether sUAVs may operate in the National Airspace System (NAS) without creating a hazard to the user, the public, or a threat to national security. In making this determination, the Secretary must consider:

- The sUAVs's size, weight, speed, and operational capability;
- Whether the sUAVs operates within the visual line of sight of the operator
- Whether the sUAVs operates outside of highly populated areas and away from close proximity to airports

Reform Act §333(a). If the Secretary determines that a sUAVs "may operate safely in the national airspace system, the Secretary shall establish requirements for the safe operation of such aircraft in the national airspace system." */d.* §333(c).

BNL's sUAVs are multirotor vehicles, weighting 25 or fewer lbs. including payload. They operate under normal conditions at a speed of no more than 50 knots and have the capability to hover, and move in the vertical and horizontal plane simultaneously. The sUAVs will operate only in the pilot's visual line of sight at all times and will operate only within the sterile area described in the Flight Manuals. Such operations will insure that the sUAVs will "not create a hazard to users of the national airspace system or the public." Reform Act Section 333 (b).

Given the small size of the sUAVs involved and the restricted and sterile environment within which they will operate, our application falls squarely within the zone of safety (an equivalent level of safety) in which Congress envisioned that the FAA must, by exemption, allow commercial operations of sUAVs to commence immediately.

Also due to the small size of the sUAVs, the low altitudes and restricted areas in which our sUAVs will operate, approval of the application presents no national security issue.

Given the clear direction in Section 333 of the Reform Act, the authority contained in the Federal Aviation Act, as amended; the strong equivalent level of safety surrounding the proposed operations, and the significant public benefit, including enhanced safety, the grant of the requested exemptions is in the public interest. Accordingly, BNL respectfully requests that the FAA grant the requested exemption without delay.

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II. PUBLIC INTEREST

This exemption application is expressly submitted to fulfill Congress' goal in passing Section 333(a) through (c) of the Reform Act. This law directs the Secretary of Transportation to consider whether certain unmanned aircraft systems may operate safely in the NAS before completion of the rulemaking required under Section 333 of the Reform Act. By granting an exemption the FAA will fulfill Congress's intent of allowing sUAVs to operate with significant safety precautions in low risk environments.

The use of sUAVs on the Hanford site can significantly reduce the risk to workers from falls and exposure in radiological zones while inspecting, surveying, or monitoring site progress. sUAVs can inspect, photograph, and collect data on hard to get to areas in radiological zones that otherwise would require worker inspection. Falls are the leading source of workplace fatality and injury on construction sites and reducing falls through sUAV use for site imaging could save workers lives.

Additionally, sUAVs could replace the use of helicopters and small aircraft to monitor sites and provide real time imagery for site mapping. The sUAVs we propose to fly in this application are under 25 pounds, and carry no combustible material on board, as opposed to the much larger conventionally powered small aircraft. Shifting to sUAVs from helicopters or fixed wing combustion engine aircraft presents a marked safety increase for DOE workers.

Lastly, sUAVs reduce the environmental impact by dramatically decreasing the energy used for aerial imaging and data collection over the Hanford site. Our sUAVs use rechargeable lithium ion batteries, as opposed to fossil fuels burned in operation of small aircraft that are many hundreds of times heavier.

III. EQUIVALENT LEVEL OF SAFETY

BNL proposes that the exemption requested herein apply to civil aircraft that have the characteristics and that operate with the limitations listed herein. These limitations provide for at least an equivalent or even higher level of safety to operations under the current regulatory structure because the proposed operations represent a safety enhancement to the already safe protocols followed on construction sites and imaging and surveying operations conducted with helicopters and other conventional aircraft.

The sUAV's planned to be operated are rotorcraft, each weighing less than 25 pounds including their payload. They would operate, under normal conditions, at a speed of no more than 20 knots. Operations will be performed by a qualified sUAVs PIC, as outlined below, to ensure that the sUAVs will "not create a hazard to users of the national airspace system or the public." Given the small size of the sUAVs involved and the pre-planned environment within which they will operate, the applicant believes that these operations fall squarely within that zone of safety (an equivalent level of safety) in which Congress envisioned that the FAA must, by exemption, allow commercial operations of sUAVs to commence immediately. Also, operation in a secured, pre-defined area will prevent the possibility of a national security issue. The operation of sUAVs by

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knowledgeable professionals with experience in the NAS will serve to enhance safety, add to the public benefit and reduce environmental impacts related to current methods of aerial photography and survey.

These limitations and conditions to which the operator, or it's employees, acting as sUAV PIC agrees to be bound when conducting commercial operations under an FAA issued exemption:

1. Safety will be the first and foremost consideration in any sUAV operation.
2. sUAV pilot will be an FAA licensed airman with at least a Commercial Pilot certificate or the sUAV pilot will be directly supervised by an FAA licensed airman with at least a Commercial Pilot certificate.
3. The sUAV FAA licensed airman will be considered Pilot in Command (PIC) whether flying or supervising, and will be responsible for safe operation of the flight.
4. Flights will be operated within visual line of sight of the PIC and/or an observer.
5. Minimum crew for each operation will consist of the sUAV PIC. An observer will be utilized if the sUAV will be flown beyond line of sight of the PIC. The observer, if required, and PIC will at all times be able to communicate by voice.
6. sUAV aircraft will utilize GPS navigation, failsafe, return-to-home (RTH) and/or flight abort safety features.
7. The sUAV will weigh less than 25 lbs total.
8. Maximum total flight time for each operational flight will be 15 minutes. The sUAV calculates battery reserve in real time, and will return to its ground station with at least 20% battery power reserve should that occur prior to the 15 minute limit.
9. Flights will be operated at an altitude of 200 feet AGL, never exceeding 400 feet AGL.
10. The sUAV pilot will be trained in advance for the safe operation of the sUAV to be operated. This will include operation of the sUAV both in normal and emergency modes of operation, and will include familiarization with the operation manual (or similar) if published by the sUAV manufacturer. Training will also include types of maneuvers to be performed and the safe operation in relation to persons, property and applicable airspace.
11. The sUAVs will only operate within a confined "Sterile Area" as defined in the Manual. The Manual also requires the establishment of a "Security Perimeter" for the flight operations area.
12. Prior to a sUAV flight, an area of operation will be established. This area of operation will include a defined lateral and vertical area, where the sUAV will operate. Safety procedures will be established for persons, property and applicable airspace within the area of operation.
13. A briefing will be conducted in regard to the planned sUAV operations prior to operation at each new location. All personnel who will be performing duties within the boundaries of the area of operation will be present for this briefing.
14. All onsite personnel will consent to the sUAV flyover on site by waiver, and the operator will obtain additional verbal or written consent of all persons who will be allowed within 100 feet of the flight operation.
15. Written and/or oral permission from the relevant property holders will be obtained.
16. All required permissions and permits will be obtained from territorial, state, county or city jurisdictions, including local law enforcement, fire, or other appropriate governmental agencies.
17. If the sUAVs loses communications or loses its GPS signal, it will have capability to return to a

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pre-determined location within the Security Perimeter and land.

18. Flights will be operated under visibility and cloud clearance requirements equivalent to Visual Flight Rules (VFR).

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Appendix A

EXEMPTION REQUESTS AND EQUIVALENT LEVEL OF SAFETY

BNL requests an exemption from the following regulations as well as any additional regulations that may technically apply to the operation of sUAV's:

14 C.F.R. Part 21, Subpart H: Airworthiness Certificates 14 C.F.R. 91.203 (a)(1)
Subpart H, entitled Airworthiness Certificates, establishes the procedural requirements for the issuance of airworthiness certificates as required by FAR §91.203 (a) (1). Given the size and limited operating area associated with the sUAVs to be utilized by BNL, an exemption from Part 21 Subpart H meets the requirements of an equivalent level of safety under Part 11 and Section 333 of the Reform Act.

The Federal Aviation Act (49 U.S.C.§44701 (f)) and Section 333 of the Reform Act both authorize the FAA to exempt aircraft from the requirement for an airworthiness certificate, upon consideration of the size, weight, speed, operational capability, and proximity to airports and populated areas of the particular s UAVs. Our small sUAVs will be operated at low speed in a controlled environment, at least five miles from an airport and more than three miles from any city or densely populated area. An analysis of these criteria demonstrates that the sUAVs operated without an airworthiness certificate, in the restricted environment and under the conditions proposed will be at least as safe, or safer, than a conventional aircraft (fixed wing or helicopter) operating with an airworthiness certificate without the restrictions and conditions proposed.

The sUAVs to be operated hereunder, DJI Phantom 2 and DJI S1000 multi-rotor aircraft weigh less than 25 lbs. with payload, carries neither a pilot nor passenger, carries no explosive materials or flammable liquid fuels, and operates exclusively within a secured and sterile area. Like other civil aircraft, operations under this exemption will be tightly controlled and monitored by the operator, pursuant to the Manual's requirements, and under the requirements and in compliance with local public safety requirements, to provide security for the area of operation as is currently done on active construction sites.

These safety enhancements, which already apply to civil aircraft operated in connection with construction sites, provide a greater degree of safety to employees, the public and property owners than conventional operations conducted with airworthiness certificates issued under 14 C.F.R. Part 21, Subpart H. Lastly, application of these same criteria demonstrates that there is no credible threat to national security posed by the sUAVs, due to its size, speed of operation, location of operation, lack of explosive materials or flammable liquid fuels, and inability to carry a substantial external load.

14 C.F.R. 45.23(b): Marking of the Aircraft
This regulation requires certain experimental, provisionally certificated aircraft, or light- sport category aircraft to be marked with letters between 2 inches and 6 inches high "limited," "restricted," "light-sport," "experimental," or "provisional," near each entrance to a cabin, cockpit, or pilot station.

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Even though the sUAVs will have no airworthiness certificate, an exemption may be needed as the sUAVs will have no entrance to the cabin, cockpit or pilot station on which the word "Experimental" can be placed. Given the size of the sUAVs, two-inch lettering will be impossible.

The equivalent level of safety will be provided by having the sUAVs marked on its fuselage as required by §45.29 (f) where the pilot, observer and others working with the sUAVs will see the identification of the UAV as "Experimental." The FAA has issued the following exemptions to this regulation: Exemptions Nos. 10700, 8738, 10167 and 10167A.

14 CFR 61.113 (a) & (b): Private pilot privileges and limitations: Pilot in command
Sections 61.113 (a) & (b) restricts private pilot certificate holders from flying aircraft for compensation or hire, and which would also have the effect of requiring a second class medical certificate. The purpose of Part 61 is to ensure the skill and competency of any PIC matches the airspace in which the PIC will be operating and the types of operations being flown. In this case, while the sUAVs will be operated as part of a commercial operation, it carries neither passengers nor cargo.

In the Grant of Exemption in FAA Docket No. FAA-2014-0352, the FAA determined that the unique characteristics of UAV operation outside of controlled airspace did not warrant the addition cost and restrictions attendant with requiring the PIC to have a commercial pilot certificate and class II medical certificate.

The equivalent level of safety can be achieved by BNL employing a licensed private pilots as PIC for their operation. Unlike a conventional aircraft that carries the pilot and passengers, the UAVs is remotely controlled with no living thing or cargo on board. Aerial surveys and inspections will occur in controlled and restricted areas, and all flights are planned and coordinated in advance as set forth in the Manual and all of the property or structures are owned and operated by the same entity. As a result, the operation has no substantial impact on any third persons not involved in the inspection. In addition, the UAV does not need to be operated in close proximity to persons and vehicles. The risks associated with the operation of the UAVs are so diminished from the level of risk associated with commercial operations contemplated by Part 61 when drafted, that allowing operations of the UAVs as requested with a pilot who has met the minimum requirements stated in Section F of the Manual exceeds the present level of safety achieved by 14 C.F.R. §61.113 (a) & (b).

14 C.F.R. 91.7 (a): **Civil aircraft airworthiness**
The regulation requires that no person may operate a civil aircraft unless it is in airworthy condition. As there will be no airworthiness certificate issued for the aircraft, should this exemption be granted, no FAA regulatory standard will exist for determining airworthiness.

The equivalent level of safety will be maintained given the size of the aircraft and the requirements contained in the Manual for maintenance and use of safety checklists prior to each flight. The DJI Phantom 2 and S1000 both have stellar safety records, demonstrating that the sUAV is airworthy. The FAA has issued the following exemptions to this regulation: Exemption Nos. 8607, 8737, 8738, 9299, 9299A, 9565, 9565B, 10167, 10167A, 10602, 32827, and 10700.

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14 CFR 91.9 (b)(2) Civil aircraft flight manual, marking, and placard requirements.
This regulation provides that no person may operate an aircraft unless a current, approved flight manual is in the aircraft. The intent of this requirement is to ensure that flight manual information is available to the aircrew while operating the aircraft. We request an exemption to this requirement since the sUAVs, given its size and configuration has no ability or place to carry such a flight manual on the aircraft, not only because there is no pilot on board, but because there is no room or capacity to carry such an item on the aircraft.

The equivalent level of safety will be achieved by keeping the flight manual at the ground control point where the pilot flying the sUAVs will have immediate access to it. The FAA has issued the following exemptions to this regulation: Exemption Nos. 8607, 8737, 8738, 9299, 9299A, 9565, 9565B, 10167, 10167A, 10602, 32827, and 10700.

14 C.F.R. 91.103: Preflight Action
Petitioner seeks an exemption from 14 C.F.R. § 91.103, which requires a PIC to become familiar with specific information before each flight, including information contained in the FAA-approved Flight Manual on board the aircraft. While the PIC will be familiar with all information necessary to safely conduct the flight, an exemption is requested to the extent that an FAA-approved Flight manual is required on board the aircraft.

An equivalent level of safety will be provided by following the Aircraft Operations Manual. The PIC will take all required preflight actions - including reviewing weather, flight battery requirements, landing and takeoff distance, and aircraft performance data - before initiation of flight. The Aircraft Operations Manual will be kept at the ground station with the operator at all times.

14 CFR 91.109 Flight instruction; Simulated instrument flight and certain flight tests
Section 91.103 provides that no person may operate a civil aircraft (except a manned free balloon) that is being used for flight instruction unless that aircraft has fully functioning dual controls. By design, sUAVs and remotely piloted aircraft do not have fully functional dual controls. Flight control is accomplished through the use of a control box that communicates with the aircraft via radio communications.

The equivalent level of safety provided by the fact that neither a pilot nor passengers will be carried in the aircraft, the ability to control the sUAVs via radio signals from the controller, and by the size and speed of the aircraft. The FAA has previously approved exemptions for aircraft without fully functional dual controls. See Exemption Nos.5778K & 9862A.

14 CFR 91.119 Minimum safe altitudes: General.
Section 91.119 establishes safe altitudes for operation of civil aircraft. Section 91.119 (d) allows helicopters to be operated at less than the minimums prescribed, provided the person operating the helicopter complies with any route or altitudes prescribed for helicopters by the FAA. This exemption is for a multirotor craft that flies similarly to a helicopter, with vertical take-off and vertical landing, which will typically operate at altitudes of 200 AGL, so an exemption may be needed to

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allow such operations. The sUAVs will never operate at altitude higher than 400 AGL and will be in a restricted area with security perimeter, where buildings and people will not be exposed to operations without their pre-obtained consent. See Manual for detailed procedures.

The equivalent level of safety will be achieved given the size, weight, speed of the sUAVs as well as the location where it is operated. No flight will be taken without the permission of the property owner or local officials. Because of the advance notice to the property owner and any onsite personnel as outlined in the Manual, all affected individuals will be aware of the planned flight operations. Compared to flight operations with aircraft or rotorcraft weighting far more than the maximum 25 lbs. proposed herein and carrying flammable fuel, any risk associated with our operations is far less than those presently presented with helicopters and other conventional aircraft operating at or below 500 AGL in the construction industry.

In addition, the low-altitude operations of the sUAVs will ensure separation between these sUAV operations and the operations of conventional aircraft that must comply with Section 91.119. Finally, the successful safety record of the DJI Phantom 2 and S1000 demonstrates that the sUAVs can be safely used at these lower altitudes and closer operating environments. We believe the slower speed, smaller mass and careful pre-planning would provide an equivalent level of safety.

14 CFR 91.121 Altimeter settings.
This regulation requires each person operating an aircraft to maintain cruising altitude by reference to an altimeter that is set "...to the elevation of the departure airport or an appropriate altimeter setting available before departure." As the sUAVs may not have a barometric altimeter, but instead a GPS altitude read out, an exemption is required.

An equivalent level of safety will be achieved by the operator, pursuant to the Manual and Safety Check list, confirming the altitude of the launch site shown on the GPS altitude indicator before flight. Moreover, the PIC will use the GPS altitude indicator to constantly monitor the sUAV's height, thus ensuring operation at safe altitudes.

14 CFR 91.151 Fuel requirements for flight in VFR conditions.
Section 91.151 (a) outlines fuel requirements for beginning a flight in VFR conditions. Our sUAVs is limited to operations in sterile and controlled environments as outlined in the Manual, and has a limited range and flight time which require an exemption from 14 CFR 91.151(a).

We feel the intention of this paragraph it to provide a reasonable reserve of energy to plan for a safe landing should there be a delay in landing. The close proximity to the ground station, the ability for both rotorcraft and small fixed wing aircraft to land in a very small space and the built in energy level monitoring of the sUAV we feel provide an equivalent level of safety if the flight is planned to be completed with 20% battery energy remaining.

BNL believes that an exemption from 14 CFR §91.151(a) falls within the scope of prior exemptions. See Exemption 10673 (allowing Lockheed Martin Corporation to operate without compliance with FAR 91.151 (a)). Operating the sUAVs, in a tightly controlled area where only people and property

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owners or official representatives who have signed waivers will be allowed, with less than 30 minutes of reserve fuel, does not engender the type of risks that Section 91.151(a) was intended to alleviate given the size and speed of the sUAVs. Additionally, limiting sUAVs flights to 15 minutes would greatly reduce the utility for which the exemption will be granted.

An equivalent level of safety can be achieved by limiting flights to 15 minutes, or enough battery reserve to ensure that the sUAVs land at the ground station with at least 20% of battery power (as determined by the onboard monitoring system and the pilot), whichever happens first. This restriction would be more than adequate to return the sUAVs to its planned landing zone from anywhere in its limited operating area. Moreover, operation will be limited to controlled areas where only people and property owners, or official representatives who have signed waivers will be allowed.

Similar exemptions have been granted to other operations, including Exemptions 2689F, 5745, 10673, and 10808.

14 CFR 91.203 (a) & (b): Carrying civil aircraft certification and registration
The regulation provides in part:

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

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

The sUAVs fully loaded weighs no more than 25 lbs and is operated without an onboard pilot. Therefore there is no ability or place to carry certification and registration documents or to display them on the sUAVs.

An equivalent level of safety will be achieved by keeping these documents at the ground flight control point where the pilot flying the UAVs will have immediate access to them, to the extent they are applicable to the sUAVs.

The FAA has issued numerous exemptions to this regulation. A representative sample of other exceptions includes Exemption Nos. 9565, 9665, 9789, 9789A, 9797, 9797A, 9816A, and 10700.

14 CFR Subpart E (91.401 - 91.417) - Maintenance inspections
The regulation provides that the operator is primarily responsible for maintaining the aircraft in an airworthy condition, including compliance with part 39 and 43. Paragraphs 91.407 and 91.409 require that the aircraft be "approved for return to service by a person authorized under 43.7" after maintenance and inspection. It is our intention that the PIC perform maintenance and inspection of the aircraft and "be authorized to approve the aircraft for return to service."

An equivalent level of safety will be achieved because prior to every flight, the PIC will inspect the aircraft

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to ensure that it is in an airworthy condition. Any general maintenance procedures or replacement of consumable items outlined by the sUAV manufacturer, if applicable, will be complied with by the PIC. In no circumstance will a sUAV be operated in a condition that is deemed, or suspected to be, unsafe. If such a determination is reached, and the problem cannot be remedied to the satisfaction of the PIC, the sUAV will not be operated until consulting with the manufacturer or one of it's authorized dealers to complete necessary repairs. We feel that due to the size, construction, and simplicity of the aircraft, the PIC can ensure an equivalent level of safety.

8900.227 Paragraph 16(c)(4) PIC Medical and Paragraph 16(e)(1) Observer Medical.

This policy provides that both the PIC and observer must have a valid FAA second-class medical certificate issued under part 67 in order to perform as a pilot or observer. Requiring the crew to meet the same medical requirements as a commercial pilot carrying passengers in a large aircraft is an unnecessary burden.

We propose that the minimum medical requirements be vision corrected to 20/20 and a valid, state-issued driver's license. The risk of both the PIC and observer becoming incapacitated at the same time and suddenly is very low. Further, since the sUAV is operating close to the ground, it could be brought in for landing in a very short time if incapacitation was suspected. Finally, our sUAV's are equipped with an automatic return to home feature which would provide a final level of safety. We feel this would provide an equivalent level of safety.

Federal Registry Summary

Pursuant to 14 C.F.R. Part **11,** the following summary is provided for publication in the Federal Register, should it be determined that publication is needed:

BNL Technical Services, LLC, seeks an exemption from the following rules:
14 C.F.R. §21, subpart H; 14 C.F.R 45.23(b);14 C.F.R. §§ 61.113(a) & (b);91.7 (a); 91.9 (b) (2);91.103(b);91.109; 91.119; 91.121; 91.151(a);91.203(a) and (b); 91.405 (a); 91.407 (a) (1); 91.409 (a) (2); 91.409 (a) (2) and 91.417 (a) & (b) to operate commercially a small unmanned vehicle (55lbs or less) in construction operations.

Approval of exemptions allowing commercial operations of UAVs to conduct aerial surveys and inspections enhances safety while reducing risk. Manned aircraft monitoring and surveying creates a greater risk because the craft are much larger, have combustible fuel, and carry an onboard human pilot. In contrast, a sUAVs weighing fewer than 25 lbs. and powered by batteries eliminates virtually all of that risk given the reduced mass and lack of combustible fuel carried on board. The sUAV is transported to the designated survey area set up. It is not flown from an external location to the work-site. The sUAVs will carry no passengers or crew and, therefore, will not expose them to the risks associated with manned aircraft flights

The operation of sUAVs, weighting less than 25 lbs., conducted in the strict conditions outlined above, will provide an equivalent level of safety supporting the grant of the exemptions requested herein, including exempting the applicant from the requirements of Part 21 and allowing commercial

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operations. These lightweight aircraft operate at slow speeds, close to the ground, and in a sterile environment and, as a result, are far safer than conventional operations conducted with turbine helicopters operating in close proximity to the ground and people.

Privacy

All flights will occur over private or controlled access property with the property owner's prior consent and knowledge. Images taken will be of individuals who have also consented to being filmed or otherwise have agreed to be in the area where aerial photography will take place.

Satisfaction of the criteria provided in Section 333 of the Reform Act of 2012--size, weight, speed, operating capabilities, proximity to airports and populated areas and operation within visual line of sight and national security – provide more than adequate justification for the grant of the requested exemptions allowing commercial operation of applicant's UAVs in construction industry pursuant to the Manual appended hereto.