

ENVIRONMENTAL ASSESSMENT, FONSI AND DECISION RECORD

**BLM, Bishop Field Office
351 Pacu Lane, Suite 100
Bishop, CA 93514**

EA Number: CA-170-06-19
Lease/Serial/Case File No.: CACA 047729
Proposed Action Title/Type: T-REX Dropsonde Aerial Testing

Location of Proposed Action:

MDM, T. 12 S. through T. 16 S. and R. 34 E. through R. 38 E. generally an area measuring 4 miles wide (East/West) and 5 miles long (North/South). Effectively the area takes in the public land on the east slope of the Sierras and the west slope of the Inyo Mountains with a center located at Independence, California amounting to about 9,000 acres.

Applicant (if any): Dr. Vanda Grubisic at the Desert
Research Institute, Division of
Atmospheric Sciences
The National Center for Atmospheric
Research

Plan Conformance: The proposed action is subject to the Bishop Resource Management Plan, approved March 25 1993. The proposed action has been reviewed and is in conformance with the plan.

Need for Proposed Action:

This proposal is part of a 3-year large scale project known as the Terrain-induced Rotor Experiment (T-REX) funded by the National Science Foundation and the National Center for Atmospheric Research, a federal government agency, to study large wind-generated rotor events in the Owens Valley. The project is expected to provide important scientific data contributing to a better understanding of wind-generated rotor events with the potential to increase general aviation safety, wind prediction models, forecasting, and particulate dispersal.

T-REX participants include investigators from a large number of U.S. Universities and agencies, the National Center for Atmospheric Research, and several European Universities and research institutes. The general area just south of Independence is considered an ideal location for this project due the steep Sierra Nevada range and the winds generated on the east slope. The BLM, U.S. Forest Service and LADWP have issued permits for a number of temporary, ground-based, measuring systems near

Independence in support of this project. These various projects are located along, at, or adjacent to an existing authorization for 17 weather tower stations arrayed along 3 transect lines running generally east and west and separated by about 2 miles with each station separated by 2 miles. Seven stations are located on public land with one on the USFS and the remaining on LADWP lands. In addition, "Optical radar, "LIDAR" radar, "REAL" radar, and an Integrated Sounding System have been permitted for the project.

The proposed project is the aerial drop of Dropsondes along long flight lines within the Owens Valley and surrounding mountains. The dropsonde contains a RF transmitter and has weather data gathering capability. They are expelled at various altitudes from planes and then parachute to the ground, transmitting weather data to receivers located in the aircraft. The dropsondes have the capability to record real time data while drifting through wind generated rotors originating from the Sierra Mountain range. They have been in use for a number of years recording weather data for wind generated events such as tornadoes and hurricanes.

The flight tracks and sounding profiles provide critical measurements that define the upstream structure of the lower atmospheric layer that flows over the Sierra Nevada topographic barrier and produces the large-amplitude mountain wave and strong rotors over the Owens Valley. Detailed measurements of the upstream atmospheric layers are the defining properties that permit accurate computer simulations of the mountain wave structure and its prediction.


Description of Proposed Action:

The proposed action would be the issuance of a 3-month temporary use permit (TUP) to Desert Research Institute for the aerial dropping of about 300 Dropsondes. See the attached description of the Vaisala Dropsonde RD93.

There would be up to 20 flights during a 60 day period between March 1 and May 31. The flights would be coordinated with aviation military operations through Edwards Air Force base and/or China Lake Naval Weapons Center. The aircraft used for the drops would be a Gulfstream V (jet), King Air 200 (turbo-prop) and a Bae-246 (jet). The aircraft are quiet in relation to a military jet or a private single-engine prop plane. These aircraft would make flight level passes at 1000 to 25,000 feet above ground level (AGL).

The flights would be used to disperse dropsondes, meteorological instruments composed of a 15" long cylinder with electronics/batteries and 9" long parachute. The dropsondes are bio-degradable except for the circuit board/batteries and should decay in less than one year or sooner if exposed to high temperatures, rain or snow.

The proposal includes several aerial flights over the Inyo Mountain Wilderness during which about 10 minutes of each flight would be over Wilderness. These flights would be between 1000-3000 feet above ground level (AGL) and would be conducted with

prudent flight safety considerations. It is conceivable that 10-15 dropsondes might land within Wilderness boundaries. See attached map showing flight paths 

Public Involvement:

Because the proposal involved the Inyo Wilderness, a notice of the proposal was sent to 102 concerned publics. The notice requested comments on the project. Six people responded, all supporting the project. One responder requested more information and said that he was concerned about: the dropsonde landing in Inyo Mountain springs, whether there would be attempts to retrieve the devices, the number of dropsondes launched, where the dropsondes would land, and degradability of device. The requested information was given to the commenter.

Environmental Impacts:

The proposed action is not within a Wilderness Study Area, Area of Critical Environmental Concern, nor Wild and Scenic River corridor, and there will be no effects on any lands so designated.

Air quality will not be affected. The proposed action is within the Owens Valley federal nonattainment area. The action will not result in the emission of PM₁₀.

There will be no impact to listed or sensitive species. There are no known listed or sensitive species or habitats within the proposed action area except for desert bighorn sheep (BLM sensitive species). These populations and habitats are located in the Sierra Nevadas and the Inyo Mountains. The habitat where the dropsondes are expected to land is not designated critical habitat. It is not expected that the project would impact either the bighorn sheep populations or their habitat. See Wildlife section.

There will be no impacts to prime farm lands, flood plains, nor water quality (including ground or surface waters). There is a minimal possibility that a dropsonde would land in an Inyo Mountain spring area. It is expected that due to the limited number of springs in the area and the periodic visits by backpackers, hikers or researchers to these springs, any dropsonde landing in a spring would be located and removed.

There will be no disproportionate impacts to low income or minority groups, per Executive Order 12898 (2/11/94).

The following resources would have no impact as a result of the proposed action.

Cultural resources

Visual resources

Vegetation

Invasive, non-native species

Minerals

Economic Impacts

Viability of the Proposed Development
Impacts to the Community and to the Tribe
Benefits of Being a Non-Gaming Tribe

Environmental Justice

Hazardous Materials

Gaming

Consistency with County Planning

Impacts to County Infrastructure

Impacts to Local Community

Adherence to Local, State and Federal Environmental Ordinances / Laws

Discussion of Trust Status, Federal Trust Responsibilities, Tribal Sovereignty

Wilderness and Wilderness Study Areas (WSA)

Some flights would be over the Inyo Mountain Wilderness area. There is no designated flight level limit for this area. It is estimated that the Inyo Wilderness has about 400-500 annual visitor use days. Most visitors travel along the Cerro Gordo, Ridge, and Swansea access roads. The area does have military over-flights periodically.

It is expected that individuals using the area during over-flights will hear the planes if they are close to the flight lines. The aircraft are quiet in relation to a military jet or a private single-engine prop plane. This will be a slight temporary noise disturbance, but not like the effect of a military jet flying over the same area. The flights and the dropsondes (abandoned) will not impact the wilderness in such a way that the Inyo Mountain wilderness experience is compromised.

Up to 15 dropsondes may land within the Inyo Wilderness. It is expected that some will be recovered but the majority will remain on the ground or land in pinyon-juniper trees. The dropsondes will degrade within one year and become unnoticeable. The public response indicated a support of the T_REX project and did not identify a long-term impact of the wilderness area.

Land Uses / Realty / Rights-of-way

The area involved in the proposed action is known to have private and military flights through the valley and over the Inyo Mountains. The proposed flights, although limited might pose an aviation hazard. Private plane interaction might be possible but it is not expected to be any different than the potential that exists between planes moving through the Owens Valley on a daily basis. See mitigation.

The flights would be over land administered by three agencies: LADWP, USFS and BLM. All three agencies have issued permits for various aspects of the T-REX project. The issue of dropsonde retrieval has been raised. It is expected that each agency will receive 100 dropsonde landings. The USFS would post a "notice" regarding the dropsondes with the request that if these devices are found by the general public that the dropsonde be picked up and dropped off at the local USFS, BLM, or White Mountain

Research Station office. In addition, the landing location coordinates may be captured and used to locate dropsondes throughout the valley. Even with retrieval by T-REX personnel and the public, it is unknown how many of the dropsondes will be left on the public land. See mitigation.

The dropsondes do have the potential to become entangled on the three large transmission lines running through the valley. T-REX personnel have indicated that, in the past, the use of dropsondes in the other areas have not interfered with power transmission lines. The devices are made of non-conducting materials and do not present a risk of producing an electrical arc across transmission lines. Notices of the proposal were sent to LADWP and Southern California Edison requesting comments. The BLM did not receive a response from either utility. LADWP has permitted some of the T-REX ground based monitoring equipment on the City land.

Wildlife habitat

It is possible that animals might ingest the electronic transmitting board and/or batteries after the dropsonde cardboard case decomposes. It is unknown whether animals will ingest the devices and it is unknown what the impact is to the animals once ingested. It is likely that animals, which encounter the dropsondes, will be curious about the device and push it around on the ground rather than actually ingesting it. The more probable outcome is that pack rats will pick up and move the device and incorporate it into a pack rat midden.

Low-level flights will be conducted so that every effort will be made to avoid gatherings of wildlife such as tule elk, bighorn mountain sheep, raptors and mule deer.

Cumulative effects

This project is not expected to contribute to cumulative effects. It is unknown how many of the dropsondes will actually be recovered, but the BLM estimates that about half of the devices will be found. The remaining 150 will likely degrade in place within one year or be buried by wind blown sand and dirt prior to degradation. Until that happens, these devices will remain visible on the ground surface.

Description of Mitigation Measures and Residual Impacts:

1. Attempts will be made by T-REX personnel to locate and remove all of the dropsondes using the coordinate data received during the over flights..
2. BLM will coordinate with USFS to include public lands in the USFS "Notice to Backpackers" requesting that the devices be picked up and deposited at the local USFS, BLM, or White Mountain Research Station office .
3. Pilots of planes used for the dropsonde must contact Edwards and/or China Lake control tower prior to flights for flight coordination and receive information on military use of the area during those periods.

FINDING OF NO SIGNIFICANT IMPACT/DECISION RECORD

I have reviewed this environmental assessment including the explanation and resolution of any potentially significant environmental impacts. I have determined that the proposed action with the mitigation measures described below will not have any significant impacts on the human environment and that an EIS is not required.

There will be no effect on threatened or endangered species as a result of the action.

I have determined that the proposed project is in conformance with the Bishop Resource Management Plan, which was approved March 25, 1993. This plan has been reviewed, and the proposed action conforms with the land use plan terms and conditions as required by 43 CFR 1610.5.

It is my decision to implement the project and issue a 3-month temporary use permit (TUP) to Dr. Vanda Grubisic for the dispersal of weather dropsondes by aircraft with the mitigation measures identified below. The project will have minimal environmental impacts due to the limited amount of surface disturbance and the short duration of the project. There will be a short-term visual impact of the dropsondes remaining on public land until they degrade within one year. The Inyo Mountain Wilderness will not be compromised by either the short duration over-flights or the unavoidable landing of dropsondes within the area.

The aircraft pilots are experienced in dispersal of dropsondes and will coordinate with Edwards and/or China Lake towers to avoid any military aircraft that might be flying in the area. Their experience in this type of low level flight in other portions of the country will contribute to a safe airspace over the Owens Valley.

It is in the public interest to allow this project in order to gather more information concerning wind and rotor events as generated in the eastern Sierras within the Owens Valley. This information will provide important weather related safety measures and predictions on wind-caused rotor events. This information may also provide data on wind events which contribute to lofting of dust, aerosol, and dust transport.

Mitigation Measures/Remarks:

1. Attempts will be made by T-REX personnel to locate and remove all of the dropsondes using the coordinate data received during the over flights.
2. BLM will coordinate with USFS to include public lands in the USFS "notice to backpackers" requesting that the devices be picked up and deposited at the local USFS, BLM, or White Mountain Research Station office.

3. Pilots of planes used for the dropsonde must contact Edwards and/or China Lake control tower prior to flights for flight coordination and receive information on military use of the area during those periods.
4. The dropsondes will have a label which requests that the device, if found, be returned to the nearest USFS, BLM, or White Mountain Research Station office or lists an address so that it can be sent back to the manufacturer free of charge.
5. Pilots will use extreme caution while flying within the Owens Valley due to private aircraft use of this corridor.

Authorized Official: _____
Field Manager, Bishop Field Office

Date: _____

SPECIAL CONDITIONS

For

TUP CACA 047729

T-REX Dropsonde Dispersal Project

1. Attempts will be made by T-REX personnel to locate and remove all of the dropsondes using the coordinate data received during the over flights.
2. BLM will coordinate with USFS to include public lands in the USFS “notice to backpackers” requesting that the devices be picked up and deposited at the local USFS, BLM, or White Mountain Research Station office.
3. Pilots of planes used for the dropsonde must contact Edwards and/or China Lake control tower prior to flights for flight coordination and receive information on military use of the area during those periods.
4. Pilots will take extreme caution while flying within the Owens Valley due to private aircraft which periodically use this corridor.
5. The dropsondes will have a label which requests that the device, if found, be returned to the nearest USFS, BLM, or White Mountain Research Station office or lists an address so that it can be sent back to the manufacturer free of charge.
6. Only existing roads and trails will be used during the retrieval of dropsondes. Off road travel is prohibited.

Vaisala Dropsonde RD93

- For use with Vaisala AVAPS and AVAPS Lite dropsonde receiving systems
- Manufactured under license from NCAR
- Widely used since 1997

The Vaisala Dropsonde RD93 is a general-purpose, precision dropsonde meant for high-altitude drops from high-speed aircraft. It transmits PTU and wind data at a high data rate.

WHAT IS A DROPSONDE?

The Vaisala Dropsonde RD93 is a meteorological device that is launched from an aircraft. Descending through the atmosphere by parachute, it measures atmospheric pressure, temperature, relative humidity (PTU) and wind from the point of launch to the ground. The RD93 is used with the Vaisala AVAPS and AVAPS Lite dropsonde receiving systems. The RD93 transmits data over a telemetry link to the onboard receiving system. The onboard GPS receiver tracks the dropsonde's horizontal movement as it is borne by the wind. The dropsonde electronics board has a microprocessor for measuring and controlling the sensor module and data transmission. The narrowband transmitter can be set anywhere in the 400 MHz meteorological band.

STABLE DESCENT

A parachute with a patented square-cone design deploys immediately upon launch. It slows and stabilizes the RD93's descent and ensures that it does not descend with a pendulum motion. The rate of descent is approximately 11 m/s. Mid-sized and large parachutes, available as options, provide descent rates of 7 m/s and 5 m/s respectively.

WHAT ARE THE VAISALA AVAPS AND AVAPS LITE?

The Vaisala AVAPS and AVAPS Lite systems receive, display and store the dropsonde data. The Vaisala AVAPS can track up to four descending dropsondes at the same time. This is an essential ability in weather reconnaissance that is carried out with high-speed, high-altitude reconnaissance aircraft.



The Vaisala AVAPS Lite is a receiving system for receiving data from one dropsonde at a time. Small and lightweight, it can be operated with a laptop PC.

INTELLECTUAL PROPERTY RIGHTS AND DEVELOPMENT

The Atmospheric Technology Division (ATD) of the National Center of Atmospheric Research (NCAR) developed the hardware and software for the Vaisala RD93 Dropsonde, the Vaisala AVAPS and the Vaisala AVAPS Lite. The hardware and software are licensed to Vaisala Inc., USA. NCAR/ATD and Vaisala are committed to the continuous development of the AVAPS and AVAPS Lite hardware and software in accordance with the evolving requirements of our customers. Vaisala AVAPS and AVAPS Lite bring together world-leading GPS technology and PTU sensor technology, the results of Vaisala's 60+ years of expertise in atmospheric measurement.

Thousands of RD93 dropsondes are used every year in hurricane reconnaissance and research and other meteorological research projects.

TECHNICAL INFORMATION

VAISALA DROPSONDE RD93

Weight	< 400 g
Size	7 cm in diameter, 41 cm in length
Maximum deployment airspeed	250 kt IAS (= 125 m/s IAS)
Shelf life	1 year from delivery

TRANSMITTER

Frequency range	400 MHz to 406 MHz
Frequency stability	±3 kHz
RF power output	100 mW
Channel spacing	100 kHz
IF bandwidth	20 kHz
Harmonic & spurious output	>50 dB below the carrier level
Total modulation	>2.5 kHz, <3.5 kHz
Telemetry range with recommended receiving antenna	325 km

GPS RECEIVER

Type	Vaisala codeless GPS receiver GPS121
Channels	Tracks up to 8 satellites simultaneously
GPS data downlink	1200 baud, digital
Modulation	FSK
Error checking	CRC

PTU MODULATION

PTU data downlink	640 baud, digital
Error checking	CRC-16

BATTERY

Type	Six lithium CR-2 cells in series
Voltage	>15 VDC
Current	Max. 235 mA, 200 mA average
Life	2 hours (operating), 3 years (shelf)

PRESSURE SENSOR

Vaisala BAROCAP [®] silicon sensor	
Range	1080 hPa to 3 hPa
Resolution	0.1 hPa
Accuracy	
Repeatability*	0.4 hPa

TEMPERATURE SENSOR

Vaisala THERMOCAP [®] Capacitive bead	
Range	-90 °C to +60 °C
Resolution	0.1 °C
Accuracy	
Repeatability*	0.2 °C
Response time (when used and measured in Vaisala Radiosonde RS80)	
6 m/s, 1000 hPa	< 2 s

RELATIVE HUMIDITY SENSORS

Vaisala H-HUMICAP [®] thin film capacitor, heated twin-sensor design	
Range	0 % to 100 % RH
Resolution	1 % RH
Accuracy	
Repeatability*	2 % RH
Response time (when used and measured in Vaisala Radiosonde RS90)	
6 m/s, 1000 hPa, +20 °C	< 0.5 s
6 m/s, 1000 hPa, -40 °C	< 20 s

HORIZONTAL WINDS

Range	0 m/s to 200 m/s
Resolution	0.1 m/s
Wind measurement accuracy	0.5 m/s RMS

DESCENT

Descent speeds	
RD93	~11 m/s at sea level
RD93M	~7 m/s at sea level with optional mid-size parachute
RD93L	~5 m/s at sea level with optional large parachute
Descent time for RD93	
From 14 km	~15 mins
From 7.5 km	~8 mins

* Standard deviation of differences between two successive repeated calibrations, k = 2 confidence level



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