

**NASA Langley Research Center
RECORD OF ENVIRONMENTAL CONSIDERATION (REC)**

Project: Geostationary Carbon Cycle Observatory (GeoCarb) Mission

1. Description and location of the proposed action:

The GeoCarb Mission would be a Class D science investigation with the primary objective of significantly improving knowledge of terrestrial fluxes in carbon dioxide (CO₂) and methane (CH₄) at science- and policy relevant scales. The GeoCarb Mission would utilize a multi-channel slit-scan spectrometer based payload that would measure absorption spectra in sunlight reflected from the ground to infer the atmosphere-column concentrations of CO₂, CH₄, and carbon monoxide (CO). The payload would also measure Solar-Induced Fluorescence (SIF), which provides direct information about photosynthesis.

The Earth System Science Pathfinder (ESSP) Program Office at LaRC would hold the contract with the GeoCarb Principal Investigator (PI), Oklahoma University (OU). As the PI, OU would be accountable to NASA for the success of the investigation, with full responsibility for its scientific integrity and for its execution within committed cost and schedule. Lockheed Martin ATC in Palo Alto, CA, would be responsible for building the payload which would include a complete 4-channel spectrograph with a warm and cold optics bench, scanning optics, control electronics, thermal control system, and pointing knowledge. Specific payload elements include 4-channel infrared (IR) spectrometer, 2 star trackers, and an on-board Global Positioning System (GPS) receiver. The GeoCarb payload would be flown on a GEO Communications satellite on a commercial spacecraft and commercially launched on a vehicle procured by SES Government Solutions. As the host mission provider, SES Government Solutions would own and operate the satellite and would be responsible for satellite procurement, launch operations, orbit insertion, satellite operations and antenna/ground station operations. The satellite vendor, launch vehicle, and launch location are still to be determined with the possibility of a launch from either NASA KSC, FL (Falcon 9 vehicle) or the Guiana Space Centre (Ariane 5 vehicle) in French Guiana.

Anticipated date and/or duration of proposed action: June 2017-December 2026

2. It has been determined that the above proposed action:

- a. Is adequately covered in an existing EA or EIS entitled: Environmental Assessment for Launch of NASA Routine Payloads Date: November 2011
- b. Does not involve any extraordinary circumstances as described in 14 CFR 1216.304(c) and qualifies for Categorical Exclusion #3(i) per 14 CFR 1216.304(d) which prescribes NASA's criteria for determining if an environmental assessment under NEPA is needed.
- c. Would have no significant environmental impacts as indicated by the results of an environmental checklist and/or detailed environmental analysis. LF461 #1392
- d. Will require preparation of an Environmental Assessment
- e. Will require preparation of an Environmental Impact Statement
- f. The provisions of E012114 do not apply to the proposed action

If the location, duration, or scope of the project as provided above should change, the LaRC NEPA Manager must be notified (4-7762).

Environmental Requirements/Considerations: (List permits, documentation, actions that must be taken prior to or during project implementation):

- The Project Team shall notify the LaRC NEPA Program Manager of the selected launch site to ensure EO12114 compliance is addressed, if applicable.
- The GeoCarb Mission would utilize existing facilities and infrastructure at participating stakeholder locations and the launch sites and would require no new construction or major modification of facilities.
- NASA has no control over the satellite, the launch vehicle, or launch site activities and the launch of the commercial communications satellite would occur with or without the GeoCarb payload.
- NASA is not responsible for any NEPA compliance documentation associated with the satellite, launch vehicle or launch site operations.
- NASA is responsible for executing this NEPA review for the GeoCarb payload only. The payload would be made of materials normally encountered in the space industry and would not utilize radioactive sources, would not carry pathogenic organisms and would not return samples to Earth.
- No reentry is planned for the GeoCarb payload.

This REC constitutes only environmental review of the proposed action. The action proponent is responsible for obtaining any other required reviews/approvals (e.g., safety, legal, OIRR, etc.) in advance of implementing the action.



Diane Hope, LaRC Proponent/Team Lead

5/22/17

Date

Wes Miksa, LaRC NEPA Manager

Date