

**Assurance Statement related to
GHG Inventory for Calendar Year 2016 and
Water Inventories for Calendar Years 2014, 2015 and 2016
prepared for Northrop Grumman Systems Corporation**

Terms of Engagement

This Assurance Statement has been prepared for Northrop Grumman Systems Corporation.

Lloyd's Register Quality Assurance, Inc. (LRQA) was commissioned by Northrop Grumman Systems Corporation (Northrop Grumman) to assure its greenhouse gas (GHG) Emissions Inventory for the calendar year (CY) 2016 and its Water Use Inventories for CYs 2014, 2015 and 2016 (hereafter referred to as "the Inventories").

The GHG Emissions Inventory includes direct (Scope 1) GHG emissions, energy indirect (Scope 2) GHG emissions and other indirect (Scope 3) GHG emissions. Scope 2 GHG emissions were calculated and verified to both the location and market based methodologies. The Scope 3 GHG emissions include air travel, rental cars, and hotel accommodation for business travel.

The following sources were excluded from the GHG Emissions Inventory on the basis of their de minimis contribution and sense-checked during the engagement:

- Scope 1 emissions from non-utility data fuel usage for buildings less than 100,000 square feet;
- Mobile emissions at sites with less than 10 vehicles;
- Process emissions for buildings less than 100,000 square feet;
- Process and fugitive emissions of all HFCs;
- Fugitive emissions from PFCs in fire suppression systems; and

The Water Use Inventory includes potable water only, and excludes municipal reclaimed water use and rainwater use. Separately metered fire protection water is excluded on the basis of their de minimis contribution.

Management Responsibility

Northrop Grumman's management was responsible for preparing the Inventories and for maintaining effective internal controls over the data and information disclosed. LRQA's responsibility was to carry out an assurance engagement on the Inventories in accordance with our contract with Northrop Grumman.

Ultimately, the Inventories have been approved by, and remain the responsibility of Northrop Grumman.

LRQA's Approach

Our verification was conducted in accordance with ISO14064 – 3:2006 *Specification with guidance for validation and verification of greenhouse gas assertions*, to provide reasonable assurance that the Scope 1 and Scope 2 GHG data, and limited assurance that the Scope 3 GHG business travel data and water use data, as presented in the Inventories have been prepared in conformance with the World Resource Institute/World Business Council for Sustainable Development (WRI/WBCSD) GHG Protocol: *A Corporate Accounting and Reporting Standard*, the Northrop Grumman GHG Reporting Protocol (NG GHG Protocol), *Version 2.3* and the Northrop Grumman Reporting Protocol 102b Water Inventory *Version 2.0* (NG Water Protocol).

To form our conclusion, the assurance was undertaken as a sampling exercise and covered the following activities:

- Conducted site visits to Northrop Grumman's three sector headquarters and the corporate office location to review primary data and information related to the Scope 1 and Scope 2 GHG emissions and water use included in the Inventories;



- Reviewed the processes for the management of data and information related to the Scope 1, Scope 2, and Scope 3 GHG emissions and water use at the corporate level and by each Northrop Grumman operating sector;
- Interviewed relevant staff responsible for managing and maintaining data and information and for preparing the Inventories at the sector and corporate levels;
- Verified the Scope 1 and Scope 2 GHG emissions for CY 2016 included in the Inventories back to source using data and information made available at the facility level;
- Verified the Scope 2 market based inventory through review of REC certificates and verification of emissions calculations.
- Verified the Scope 3 GHG emissions for CY 2016 and water use data for CYs 2014, 2015 and 2016 through a review of aggregated level data and information and calculation spreadsheets provided by Northrop Grumman.

Level of Assurance & Materiality

The opinion expressed in this Assurance Statement for Scope 1 and Scope 2 GHG emissions has been formed on the basis of a reasonable level of assurance and at a materiality of 5%.

For Scope 3 GHG emissions and water use, the opinion has been formed on the basis of a limited level of assurance and at a materiality of the professional judgment of the verifier.

LRQA's Opinion

Based on LRQA's approach, the total Scope 1 and Scope 2 GHG emissions disclosed in the Inventory, as summarized in Table 1 below, are materially correct, and the Inventory has been prepared in accordance with the WRI/WBCSD GHG Protocol and the NG GHG Protocol.

Additionally, LRQA did not find any evidence that the Scope 3 GHG emissions or the water use disclosed in the Inventories, as summarized in Tables 1 and 2 below, are not materially correct and are not prepared in accordance with the WRI/WBCSD GHG Protocol, NG GHG Protocol and NG Water Protocol.

LRQA's Recommendations

Consider clarifying water use definitions and categories within the NG Water Protocol.

Signed

Dated: April 27, 2017

A handwritten signature in blue ink, appearing to read 'Andrea Bockrath'.

Andrea Bockrath
Lead Verifier
On behalf of Lloyd's Register Quality Assurance, Inc.,
1330 Enclave Parkway, Suite 200,
Houston, TX 77077

LRQA Reference: RMA10227



Table 1. Summary of Northrop Grumman GHG Emissions Inventory CY 2016

Scope of GHG emissions	Description	tCO2e
Scope 1	Direct GHG emissions	130,490*
Scope 2 (Location-Based)	Energy Indirect – Location-Based	400,915
Scope 2 (Market-Based)	Energy Indirect – Market-Based	392,008
Scope 3 (business travel)	Other Indirect GHG emissions	126,685

*Excludes 11,000 tCO2e of carbon offsets.

Table 2. Summary of Northrop Grumman Water Use Inventories CYs 2014, 2015 and 2016

Scope of Water Use Inventory	Description	Million gallons
CY 2014	Potable Water	946
CY 2015	Potable Water	892
CY 2016	Potable Water	892

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Due to inherent limitations in any internal control, it is possible that fraud, error, or non-compliance with laws and regulations may occur and not be detected. Further, the verification was not designed to detect all weakness or errors in internal controls so far as they relate to the requirements set out above as the verification has not been performed continuously throughout the period and the verification carried out on the relevant internal controls were on a test basis. Any projection of the evaluation of control to future periods is subject to the risk that the processes may become inadequate because of changes in conditions, or that the degree of compliance with them may deteriorate.

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