DATA
ACCOMPANYING REPORT

AIR QUALITY

The intensive monitoring program for assessment of air quality in Bulgaria was organized in 3 stationary areas. The territories where the monitoring stations were located are attributed to two different climatic regions: Black sea climatic region – Eastern Balkan mountain subregion (site Staro Oriahovo) and Mountainous climatic region –Middle mountain subregion (sites Yundola and Vitinia).

The stations are equipped with automatic devices collecting data for air quality parameters in real time. The following stations were determined:

- **Vitinia (0001)** - This area is situated in the western part of Middle Stara planina (the Balkan mountain), at an altitude of about 953 m. above the sea level, on the territory of Vitinia State forestry district. It is representative for the beech forests. The region is under the influence of local and regional pollution sources;
- **Staro Oriahovo (0004)** – It is situated in the eastern part of Stara planina, at an altitude of about 200 m above sea level in "Gorska baraka" area of the Staro Oriahovo State forestry district. The region is representative for oak forests. There are regional pollution sources;
- **Yundola (0003)** – This area is situated in the western part of the Rodopi mountains, at an altitude of about 1602 m above sea level, in the "Starina" area, on the territory of the experimental training forest station Yundola of the University of Forestry /UF/. It is representative for coniferous forests and is far away from local pollution sources.

Air Quality equipment

Sensor/ System	Manufacturer	Type	Specifications
Remote transmission	Siemens	Siemens GSM Dualband Modem TC 35T, antenna,	GSM Dualband Modem Terminal
Data logger	Infologica	Super Micro SBC-19	Data logger
Soft ware	Project Automation	Eco Remote	Data management, Import, Export; Meteorological and

			Air Quality data interpretation, remote transmission
SO2	Monitor Labs.	ML9850	Air quality measure
NOx	Monitor Labs.	ML9507	Air quality measure
O3	Monitor Labs.	ML9812	Air quality measure

Due to neglect low concentrations of ammonia it was accepted that pollutant to be not measured.

The monitoring activities in 2012 were prepared in compliance with the ICP Forests Manual and comprise the following activities:

- Assessment of ambient air quality – Air pollution concentrations are measured in every 1 hour. Data for automatically measured atmospheric pollutants - **SO_2, NO, NO_x, NO_2** and **O_3** are transmitted and monitored in real time; For the needs of ICP Forests, only **SO_2, NO_2** and **O_3** data were reported;

- **Validation of the data**

The present submission report for air quality is based on the more than 90% of validated data for each of the measured compounds. The percent of the valid data is as follow:

1. Vitinia (**0001**) – 99.3% for SO_2, 93.5% for NO_2 and 98% for O_3;
2. Staro Oriahovo (**0004**) – 95.8% for SO_2, 94.2% for NO_2 and 94.5% for O_3;
3. Yundola (**0003**) – 94.9% for SO_2, 90.0% for NO_2 and 95.7% for O_3.

- **Submission of the data**

Assessment of atmospheric pollutants

Vitinia – The tendency of lower average annual concentrations of sulfur dioxide and nitrogen oxides than the *Low assessed thresholds* (LAT) for the protection of natural ecosystems remains. In contrast to 2011, in 2012 the average daily concentration of ozone in the period from May to July is lower and AOT40 not exceed the *short-term target rate* (STTR) for the protection of vegetation.

The lower ozone concentrations recorded during the vegetation period of 2012 are probably a reason for the lack of visible damage to the leaves of the sample trees in August.

Staro Oriahovo – The average annual concentrations of sulfur dioxide and nitrogen oxides are lower than the *Low assessed threshold* (LAT) for the natural ecosystems. The values of AOT40 (May-July), gradually decrease since 2007, as in 2012 are considerably lower than the level of the *long-term target rate* (LTTR).

Yundola – The average annual concentrations of sulfur dioxide and nitrogen oxides are significantly lower than *Low assessed threshold* (LAT) for the natural ecosystems. In 2012 the value of AOT40 (May-July) is vastly higher (60%) than the 2011 and 1.5 times than the level of *the short-term target rate* (STTR).