

## **DID WE ACHIEVE WHAT WE EXPECTED AFTER "PHASING OUT LEADED PETROL IN SRI LANKA"?**

*Samarakkody, R.P., Premasiri, H.D.S., Kumari, B.M.S.S.,  
Environmental Division, National Building Research Organisation, 99/1, Jawatta Road,  
Colombo 05.*

A number of studies in Sri Lanka had reported high concentrations of roadside ambient lead levels and urinary and blood lead levels in occupants in urban areas. Lead (Pb) is one of the six criteria air pollutants considered as cumulative and protoplasmic poison is a proven carcinogen, which also affects respiratory, cardio, nervous and renal systems. Air borne lead can also adversely affect on plant growth, plant species diversity and the ecology of bacteria and fungi of soil and aquatic ecosystems.

Lead is used as a raw material in number of industries such as storage battery, pigment, printing, foundry, metallurgy, and as alkyl additives in petroleum industry. In Sri Lanka, burning of leaded gasoline was once identified as the major source of ambient lead pollution. The consumption of gasoline in Sri Lanka increased from 181 MT in 1990 to 249.5 in 2001. It has been estimated that more than 54 % of the total consumption of gasoline is used within the Western Province.

Several steps were taken by the Sri Lankan government to control lead emissions after "Clean Air 2000" Action Plan in 1992, which aimed at bringing down 30 % of lead usage in petroleum sector by year 2000. National Policy on Air Quality Management proclaimed in 1999, under the Ministry of Forestry and Environment insisted that Ceylon Petroleum Corporation initiate action to bring out necessary process changes enabling the Corporation to produce Lead-free gasoline by year 2005, and terminate completely by year 2010. However, with the advent of the Government's "One Hundred Days Programme", the Ceylon Petroleum Corporation accelerated the phasing out of leaded gasoline and discontinued the blending gasoline with lead additives in April 2003.

With the above programme, NBRO initiated a monitoring programme to monitor ambient "Total" and "Particulate" Lead Levels every eighth day, continuously for a period of six

months at three distinct locations in Colombo. The outcome of the study indicated that a reduction of total lead levels; 82% at Fort, 84% at Meteorological Dept., Colombo 07, and 81.5% at NBRO premises, Colombo 05, (Fig. 01) during the study period. However, from October to December 2002 it showed a slight increase in ambient lead levels, which is common to all three locations that may be due to the "North-East" monsoon effects. This effect is comparable with NO<sub>2</sub> exposure measurements carried out at both Fort and Meteorological Department sites during the same period (Fig. 02).

Comparison of the "Total Ambient Lead" levels with past data (from 1993 to 2002) indicates that the ambient lead levels had been reduced by more than 90% over the past 10 years (Fig. 03). This reduction may be due to the various steps taken by the Ceylon Petroleum Corporation (CPC) to reduce lead levels in gasoline during this period.

The "Particulate Lead Levels" at all three locations show slight reduction in trend patterns as given in (Fig. 04). Comparison of particulate lead levels with past data at all three locations (from September 1999 and September 2002) also supports the outcome of reduction in ambient lead levels in the recent past.

Lead in tail pipe emission of gasoline driven vehicles were also tested and found that more than 90% reduction in total lead emissions from gasoline driven vehicles in December, 2002 when compared to those of year 1994. It was further observed that the particulate lead emissions were at a very low level when compared to the total lead in direct emissions of gasoline driven vehicles.

**Acknowledgement:**

***US-AID US-Asia Environment Partnership Programme, National Research Council of Sri Lanka, AirMAC, Ministry of Environment and Natural Recourses, Central Environmental Authority, Meteorological Department are acknowledged for the assistance rendered.***

Figure 01, Concentration of Total Lead

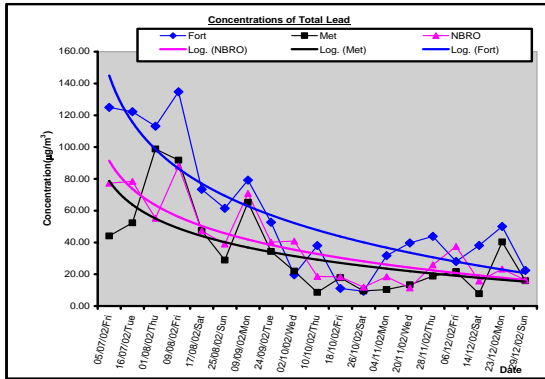


Figure 02. Exposure levels of NO<sub>2</sub>

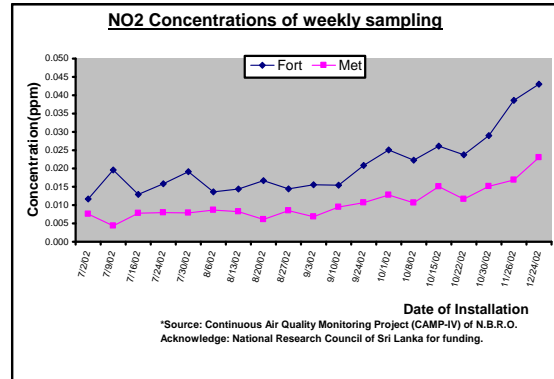


Figure 02. Comparison of the Total Ambient Lead at NBRO

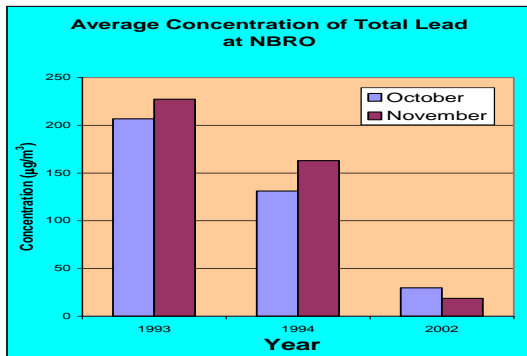


Figure 04. Concentration of Particulate Lead

