

## **8. ENVIRONMENTAL MONITORING**

Published baseline data on Larsemann Hills as well as that generated in the course of the work at the site during the summer seasons of 2003-04, 2004-05 and 2005-06 have been used to establish the “footprint” of the station. A regular systematic monitoring program will be developed to integrate the work undertaken by other national agencies operating in the area. An environmental monitoring laboratory will be equipped with instruments like aethalometer, aerosol spectrometer, multistage impactor etc. for long term monitoring including physico chemical parameter of lake, marine and air environment. The environmental monitoring programme will establish close linkage between predicted and actual values during construction and operation of the station and facilitate devising mitigation measures that are needed to reduce the adverse impacts. All the workers and the occupants of the station will be given environmental training on the established guidelines. Following parameters are needed to be monitored with regard to environmental indicators:

**Table 12: Environmental Monitoring Parameters**

Environmental Indicators	Parameters	Duration
Air	Ambient Air Quality Monitoring for SO <sub>2</sub> , NO <sub>x</sub> , CO, PM <sub>10</sub> , carbon soot	8 hourly, 24 hourly during Summer period (three points)
	Wind velocity, wind direction temperature, snow, humidity, cloud cover, rainfall, solar radiation, wind rose	Hourly average on yearly basis
Radiation	Radon level and Gamma counts in atmosphere, soil and rock	Monthly (4-5 points within 1 km radius)
Noise Quality	Ambient noise levels, day and night noise levels (L <sub>10</sub> , L <sub>50</sub> , L <sub>90</sub> ), frequency analysis	During Summer (1 m from machines, 4 points on periphery of station 0.5 km radius)
Water Quality (Sea and Lake)	Physico chemical analysis (conductivity, pH, color, TSS, TDS, TOC, DO, BOD, COD, Total hardness, Calcium, Mg, Cu, Fe, Mn, Nitrate, Phenolics, Hg, Cd, Se, As, Cn, Pb, Zn, Cr, Anionic Detergents, Polynuclear Aromatic Hydrocarbons, Mineral Oil, Alkalinity, Acidity, Organic Nitrogen, Phosphate, Sulfates, Chlorides, Fluoride, Total coliform, Fecal coli form, phytoplankton and Zooplankton. Sediments (Grain Size, TOC, TIC, Cu, Pb, Zn, Cd, Hg, petroleum hydrocarbons, and PAH (benzo a-pyrine, benzo e-pyrine)	Once in a month (from all the available sources minimum six places) during summer period

Land	Soil analysis (TOC, TIC, Cu, Pb, Zn, Cd, Hg, total petroleum hydrocarbon and PAH), grain size, type, behavioral change, erosion potential pre and post construction, Heavy Metal analysis, permafrost layer depth	Once in a year
Ecology of Marine and Lake system	Population size, breeding success, spatial extent, metals, alien species its distribution	Once in a year

Apart from the above-mentioned monitoring parameters, fuel spill monitoring from the fuel storage tank, supply vessel, and refueling into machinery and vehicle shall be carried out. Strict adherence to environmental protocol will be one of the prime objectives during construction and operation of the station. Any fuel spill substantive in nature will be reported. Routine visual inspection will be carried out as a part of the environmental monitoring.