1 GREENBELT PLAN

Scope

Afforestation activities not only serve as foreground and background landscape features resulting in harmonizing and amalgamating the physical structures of LNG Terminal with the surrounding environment, but also contribute to the overall improvement in the environment. In addition to this plants have an in-built mechanism to absorb a wide variety of pollutants.

Purpose

The main purpose of the plan are:

- Enhancing the vegetation cover for increasing the biodiversity of the region;
- Providing aesthetic value to the project area;
- Enhancing the ecological equilibrium of the area and
- Attenuate dust emission and noise.

Demarcation of plantation area

Details area demarcation will be carried out during detailed site planning stage. The major focus will be given for demarcation of area for terrestrial plant species. The greenbelt plantation will carried out in phase manner; for this phase wise development plan will be prepared and same will be earmarked in the plan. The demarcated greenbelt plantation area is shown in ***Figure 2.6***.

Selection of Plant Species

Selection of plant species is to be done on the basis of their adaptability to the existing geographical conditions and the vegetation composition of the topography of the region. The selection of tree species suitable for plantation at the industry shall be governed by guiding factors as stated below:

- Selection of the plant species to be done on the basis of their adaptability to the existing geographical conditions and the vegetation composition of the vegetation type of the region;
- During the development of the greenbelt within the project area, special attention would be given to species having nitrogen fixing capability, ornamental values, and species of very fast growth with good canopy cover.
- The tree should be tolerant to air pollutants present in the area.
- The tree should be able to grow and thrive on soil of the area, be evergreen, inhabitant, having minimum of leaf fall.

- Plants with more than 10 m height, fair amount of canopy cover shall be preferred so that these plants can effectively reduce the pollution load as well as provide maximum amount of shade.
- Since the tree trunks are normally devoid of foliage (up to 3 m), it would be appropriate to have shrubs in front of such trees to give coverage to such portions.
- The tree should be fast growing and indigenous and should maintain ecological, land and hydrological balance of the region.

Recommendation of Species for Plantation

Following is a suggestive list of the plants, which could be considered for pollution abatement:

Table 1.1 Suitable Plant Species for Greenbelt Plantation

Sl no	Species Composition	Percentage
A.	***Trees***	
1.	*Acacia arabica*	5
2.	*Aegle marmelos*	7
3.	*Ailanthus excelsa*	5
4.	*Albizia lebbeck*	5
5.	*Alstonia scholaris*	5
6.	*Artocarpus integrifolia*	5
7.	*Azadirachta indica*	10
8.	*Dalbergia sissoo*	5
9.	*Mangifera indica*	10
10.	*Polyalthia longifolia*	10
11.	*Putranjiva roxburghii*	8
12.	*Syzygium cumini*	5
13.	*Terminalia arjuna*	5
14.	*Cassia siamea*	5
15.	*Casuarina equisetifolia*	5
16.	*Mimusops elengi*	5
B.	***Shrubs***	
17.	*Adhatoda vasica*	20
18.	*Nerium indicum*	20
19.	*Bougainvillea spectabilis*	20
20.	*Vitex negundo*	20
21.	*Lawsonia inermis*	20

Spacing and Plantation density

Tree Plantation

The spacing and pit size would be varying according to the choice of species and compatibility of various species to grow together in a niche. Small spread would be planted at a distance of 2.5m x 2.5m apart, while tall varieties with spread would be planted at a spacing of 3m x 3m. The pit size would be 30cm x 30cm x 30cm for cylindrical whereas for the broadleaf species the size of 45cm x 45cm x 45cm need to be adopted. Approximately 1600 saplings will be planted per hectare of land.

Pit Preparation

Adequate quantity of soil and manure mixture @ 4:1 is necessary for each pit. The soil mixture is to be filled in each pit and watered well to form a puddle before the actual transplantation

Fencing and Closure

A minimum block plantation would be undertaken by providing barbed wire fencing including watch and ward for assuring protection from biotic interference.

The Planting Scheme

Available space within the proposed project site will be utilized for greenbelt development. For the purpose of pollution attenuation, the green belt shall be developed in three tiers as stated below:

First Tier **–** Consists of shrub species having good levels of air pollution tolerance limits which is referred to as Tolerance zone.

- *Broken or interrupted*: Trees shall be planted in between the shrub species at regular intervals in the first tier. The branching pattern and canopy formation of these species is not uniform.
- *Drooping canopy:* Trees shall be planted in between the shrubs in the first tier. The branches and leaves of these species droop downwards e.g. *Polyalthia longifloia*.

Second Tier - consists of trees having fast growth potential with conical canopy identified as Dispersion Zone.

- *Rotund type:* The shape of the crown is more or less rounded; branches and leaves are closely arranged. These tree species are suitable for the second and third tiers.
- *Flat topped canopy:* The branches of the crown are uniformly shaped flat-topped crown and the spread of the crown is wide to cover a large area e.g. *Cassia siamea*. These tree species are suitable for the second and third tiers.

Third Tier - Trees having hairy leaves with thick and round canopy referred to as the Absorption Zone.

- *Cylindrical type:* The branches and leaves form a close network and give the longitudinal spread e.g. *Dalbergia* sp. These tree species are appropriate in between the trees in the third tier.
- *Chimney type:* The branches give the appearance of long chimney. These tree species are used for the outer rows of the third tier.
- *Conical type:* The growth of main stem and horizontal branches appear in the form of a cone. e.g. *Casuarina* sp. These tree species are suitable in the peripheral rows of the third tier.

Area Allocated

A detailed survey was conducted with respect to existing vegetation types, vegetation diversity, etc. in the project area for development of greenbelt around project components. The greenbelt plan has been formulated considering the parameters such as climate, soil types etc. and applicable norms. In the present case an area of about 33.20% (6.5 ha.) of the total project area has been allocated within the site for development of the green belt. The plantation area is shown in ***Figure 2.6***. Approximately 1600 saplings will be planted per hectare of land. Total number of saplings to be planted is 10400 nos.

Maintenance of Plantation

The desired saplings for plantation will be obtained from the nearest Forest Department Nursery. Necessary steps to be taken for better results are as follows:

- One/two years old seedlings will be planted for plantation
- Regular de-weeding, mulching of seedlings and application of oil cakes and organic manure should be carried out to boost up growth potential
- Watering of the plantation during dry season to avoid water loss

Cost of Implementation

Total implementation of greenbelt for 5 years would be INR 15 lakhs