
CHAPTER 8

ENVIRONMENTAL MANAGEMENT PLAN

8.1 INTRODUCTION

After the Environmental Impact Assessment and Risk Assessment of the proposed 3 pipeline projects in TD Area, it is essential to identify project specific actions for implementation during pipeline projects construction and operation. These actions are compiled in the form of an Environment Management Plan (EMP) which delineates the mitigative measures. Though most of the environmental impacts identified in the proposed pipeline projects are relatively minor and localized and vulnerable zones identified in risk analysis are restricted to relative short distances, project specific recommendations are given below for implementation to further reduce adverse environmental impacts and improve operational safety of these projects.

8.2 MITIGATIVE MEASURES FOR MINIMISING ENVIRONMENTAL IMPACTS

8.2.1 General Measures Required During Construction and Operation of 3 Pipeline Projects in the Same ROW

The following environmental management requirements are to be implemented by the personnel of 3 pipeline projects:

1. Cutting of trees/shrubs/tall grasses and damage to agricultural crops should be avoided as far as possible.
2. Any loss of agricultural crops in the ROW due to land procurement for laying of 3 pipeline projects should be compensated.
3. Domestic waste water as well as food left-over and other organic solid wastes generated in the ROW of 3 pipeline projects should be disposed off in safe manner as per the approved procedures.
4. Appropriate arrangements should be made for drainage and sewage disposal for maintaining hygienic conditions in ROW while laying pipeline projects.
5. As far as possible only natural gas should be used as fuel in the crude oil dispatch pumps and natural gas compressor/booster.
6. Only HSD of low sulphur (0.1% maxm.) content should be used for fire tenders.

7. Workers should not engage in hunting of any wild animal/bird, if sited, for their meat in and around the ROW while laying pipelines and during ground patrolling by walking in the ROW.
8. Local persons should be engaged preferably as unskilled and/or semi-skilled labour for the laying of 3 pipeline projects as far as possible.

8.2.2 Specific Measures Required During Construction and Operation of Pipeline Projects

The overall responsibility for compliance of health, safety and environment (HSE) policy of OIL during laying and operation of 3 pipeline projects in TD Area rests on General Manager (Prod-Oil) stationed at Duliajan. General Manager (Prod-Oil) will have Project Manager/ Pipeline Engineer to supervise laying and operation of pipelines. He will also cooperate with regulatory authorities who may like to monitor the adequacy of environmental control measures used by OIL during laying and operation of 3 pipeline projects. OIL has a well established EMP policy to address all issues related to HSE during laying and operation of 3 pipeline projects for crude oil and natural gas transportation.

8.2.3 Management Measures for Leakage of Crude Oil and Natural Gas from Buried Pipeline Due to Sabotage

For safe and reliable operation in 45 km long pipeline corridor from Baghjan to STF, Baghjan to CGGS/OTP and Baghjan to Makum OCS, OIL will undertake following specific management measures:

1. The pipes to be used for laying the line will be pre-coated pipes and this coating will protect the pipe line from external corrosion. In addition, induced current cathodic protection through intermediate Cathodic Protection Stations using grid power supply and battery backup will be provided to keep the pipeline in noble state for preventing external corrosion. Injection of suitable corrosion inhibitor will help in reducing internal corrosion.
2. Pipeline sections across major road crossings will be laid in a casing pipe.
3. Regular patrolling of pipeline route will help in reducing as well as quickly detecting the pipeline sabotage.
4. Installation of efficient multiple communication facilities such as, WHF telephone network, P&T telephone system, radio wireless network (HF) and Walkie-Talkie at Baghjan pumping station and STF receiving station. The above systems will ensure a continuous two way flow of vital information for safe and efficient operation of pipeline.
5. In case a spill of crude oil due to pipeline leakage on land occurs, then after safely controlling the leakage as quickly as possible including stopping of COD pump at Baghjan, isolating the damaged section by closing the isolating valves and repairing the damaged pipeline section, the following management measures will be adopted by OIL depending upon the location of leakage:
 - **Leakage on Land:** The area of leakage will be cordoned off and the same will be guarded by Security Personnel and stand by Fire Tender will be posted at the site. After the spilled oil is collected in containers/ tankers,

the same will be transported to either Central Tank Farm (CTF) or Secondary Tank Farm (STF) at Duliajan. Thereafter the entire contaminated soil will be properly excavated and will be replaced by fresh soil and ground surface properly leveled. Contaminated soil will be transported to OIL complex at Duliajan for necessary remedial measures for safe disposal.

- **Leakage in Water Body:** (a) Leaked crude oil will be recovered from the water surface to the extent feasible by using appropriate measures and the same will be transported to either CTF or STF at Duliajan.; (b) river banks downstream of leakage point will be patrolled by OIL staff to ensure that no naked flame is used if oily layer is visible on water surface or river banks and oil contaminated water is not used for any purpose and stand by Fire Tender will be posted; and (c) river bank or island soil showing significant oil contamination will be properly excavated and contaminated soil will be transported to OIL complex at Duliajan for necessary remedial measures for safe disposal.
6. In case of violent escape of natural gas due to pipeline leakage, surrounding area should be cordoned off by security / police personnel and stand by Fire Tender will be posted at the site. No naked flame or any other source of ignition should be allowed in the area which may cause fire in the escaped natural gas. Furthermore, leakage of gas should be controlled as quickly as possible, isolating the damaged section by closing the isolating valves and repairing the damaged pipe section. Only after the pipeline is repaired and natural gas concentration in surrounding area due to pipeline leakage falls below the lower explosion limit, the security/police personnel be removed from the cordoned area.
