

PROJECT SUMMARY

APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR THE ESTABLISHMENT OF LPG BOTTLING AND DISTRIBUTION CENTRE

Name of Project	Establishment of an LPG Bottling and Distribution Centre
Name of Developer/Company	Amar Chetram - CB GAS
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Introduction

Background

CB Bas is a registered business under the Registration Act of Guyana located in Linden. With the rapid growth of the development within Guyana, the proprietor has decided to venture into the production and supply of Bottle Gas for domestic and commercial use.

Project Overview and Location

Physical Location and Characteristics: The facility is situated at the junction of the Linden Highway and Millie's Hideout. Linden serves as a critical logistics hub at the confluence of the Demerara River shipping lane and the South Bound Road, acting as the gateway to bauxite and gold fields. The project targets a service area bounded by Soesdyke (North), Lethem (South), and Bartica (West), reaching a population of approximately 100,000 people.

Land Nature: The project has access to approximately five acres of company-owned, non-disputed land, however will only utilize 2 acres for this venture. The site is part of the Group's existing industrial footprint in Linden.

Feasible Alternatives: The project considers alternative designs for production processes and layout to ensure maximum safety distances.

Baseline Information: The region is experiencing rapid residential and industrial growth, creating a high demand for energy. Current retail LPG prices range from \$4,500 to \$4,800 per 20lb cylinder; this project aims to reduce these costs by more than 50% to roughly 2,000–2,200.

Community Benefit: Employment will be created for persons within the community of Linden in which no underage persons will be employed. Employees will be trained as much as possible on occupational safety practices at the work place so as to ensure that the health and safety of workers are not compromised. Also, adequate PPE relevant to the job will be provided to all workers and appropriate warning and safety signs will be installed throughout the project site.

Project & Investment Timeline: This project will be implemented in three phases with a final capacity of 30,000 bottles per month. Phase 1 will encompass the construction of the plant, all fixed assets, the production and delivery equipment to supply gas to up to 5,000 users, monthly. The original infrastructure will be purposed built to accommodate a targeted demand of 20,000 cylinders per

month as the dissemination expands further into other communities. Complementary Phases (Phases 2 & 3) will be driven by market demand. Additionally, three Storage Tanks, one Bulk Truck, two Delivery Trucks, one Service and Staff Vehicle and 40,000 cylinders will be added to the project, in the future.

Project Description

The project will be executed in two phases construction and operation.

- **Construction**

The construction of several buildings to house production, administration, safety, warehouse, storage and electrical generation will be required for the project. The project will utilize approximately 2 acres of land, thereby providing ample space for electricity generation, water storage, septic system, garbage containment, parking, storage bonds, safety equipment and future expansion.

- **Operation**

An LPG Bottling Plant will be a facility designed to receive bulk Liquefied Petroleum Gas, store it safely, and fill cylinders for distribution to commercial and domestic consumers. The operations are primarily physical handling and transfer processes, involving no chemical reactions.

Key Operational Stages

The facility typically comprises four main stages:

Receipt of LPG: Bulk LPG is received via road tankers (bullet trucks) from supply depots.

Storage: The received LPG will be transferred to large-capacity storage vessels. The facilities will use **mounded storage vessels** (partially or fully earth-covered bullets) to enhance safety, with capacities frequently reaching 1,200 MT per vessel. Storage is designed and operated in accordance with stringent safety standards (e.g., OISD norms).

Bottling/Filling: LPG is piped from the storage area to the filling shed, where it is dispensed into cylinders using automated carousel systems. The process is closed-circuit to prevent fugitive emissions. Empty cylinders received from the market are inspected for defects; those with damaged valves undergo cold repair and degassing before being refilled.

Dispatch: Filled cylinders are quality-checked, weighed, and loaded onto stake trucks for transport to authorized distributors.

Key Plant Components

1. Empty and Filling Sheds
2. Filled Cylinder Storage Shed
3. Mounded Storage Vessels
4. Tank Truck Decantation (TLD) Area with unloading bays
5. Valve Change and Statutory Testing Area
6. Product Pump House and Compressor House
7. Administrative and Safety Buildings
8. Fire Water Pump House and Fire Protection System
9. Diesel Generator (DG) Sets for power backup

Potential Environmental Impacts and Mitigation Measures

The establishment of the facility (construction of buildings) will have short-term/minimal impacts, however, the main environmental concern of this project is the operational phase. The operation of an LPG bottling plant presents a range of potential environmental, safety, and social impacts, varying between the construction and operational phases.

Construction Phase Impacts

Aspect	Potential Impact
Air Quality	Generation of fugitive dust from excavation, earthmoving, and material handling. Exhaust emissions from construction vehicles and machinery.
Noise Environment	Elevated and intermittent noise levels from construction equipment (e.g., hammering, metal cutting, excavation) reaching up to 80-85 dB(A).

Aspect	Potential Impact
Water Environment	Increased risk of soil erosion and silt-laden runoff entering local water bodies during earthworks. Potential for minor water contamination from construction-related activities.

Operation Phase Impacts

Aspect	Potential Impact
Air Quality	Fugitive hydrocarbon emissions from unloading hoses, faulty connections, leaking cylinders, or minor valve leaks. Emissions from DG sets during power failures. Increased vehicular emissions from tankers and trucks.
Noise Environment	Continuous or intermittent noise from pumps, compressors, filling carousels, and fire pumps (70-80 dB(A)). Noise from vehicle movements in the loading and unloading bays.
Water Resources	Potential for groundwater or soil contamination due to LPG leaks or spills. Generation of domestic wastewater and stormwater runoff that requires proper management.
Waste Generation	Generation of scrap metal (defective cylinders), waste oil, and general solid waste requiring recycling or disposal.
Major Accident Hazards	High-consequence safety risks include loss of containment leading to fires, explosions, Vapor Cloud Explosions (VCE), and Boiling Liquid Expanding Vapor Explosions (BLEVE). These can result from overfilling, external fire, equipment failure, operator error, or sabotage. Such events pose a significant risk to on-site personnel, nearby communities, and the environment.

Aspect	Potential Impact
Traffic & Socio-economic	Increased heavy vehicle traffic on local roads, potentially leading to congestion, road wear, and minor local air quality impacts near the plant gate.

Mitigation Measures

Effective mitigation measures are categorized by phase and focus area to manage the identified impacts.

Construction Phase Mitigation Measures

Impact Area	Mitigation Measures
Air Quality	Cover all construction materials during transport. Implement water spraying at the construction site for dust suppression. Proper maintenance of vehicles and machinery, with valid "Pollution Under Control" (PUC) certificates.
Noise	Acoustic treatment for DG sets and installation of silencers. Provide hearing protection (earplugs/muffs) to workers in high-noise areas. Schedule high-noise activities during daytime hours to minimize community disturbance.
Water & Soil	Erect temporary sedimentation basins to prevent silt-laden runoff. Proper storage of construction materials and fuels to prevent spills. Follow guidelines to minimize soil disturbance and prevent contamination.

Operation Phase Mitigation Measures

Air Quality

- **Fugitive Emissions:** Install fixed Gas Monitoring Systems (GMS) at strategic locations to detect hydrocarbon leaks in real-time. Ensure all bottling operations are closed-circuit to minimize leaks.
- **DG Sets:** Fit DG sets with stacks of sufficient height to ensure adequate dispersion of exhaust gases as per regulatory guidelines.
- **Vehicular Emissions:** Enforce the "Pollution Under Control" (PUCC) certificate requirement for all trucks and tankers entering the facility.

Noise Environment

- **Equipment:** Provide acoustic enclosures and anti-vibration pads for DG sets, pumps, and compressors.
- **Mitigation:** Ear protection for workers in high-noise zones, and maintain a well-developed green belt around the plant perimeter to act as a natural noise barrier.

Water and Waste Management

- **Water Management:** Implement a system for recycling and reusing water wherever possible (e.g., fire water, domestic wastewater after treatment). Install non-point source pollution reduction facilities to manage storm water runoff.
- **Waste Management:** Defective cylinders should be sent for recycling through authorized channels. Implement a robust waste segregation, reduction, and recycling program to achieve Zero Waste to Landfill targets.

Safety and Fire Protection (Critical Mitigation)

- **Process & Layout:**
 - Use mounded storage vessels to provide inherent protection against external fire and impact.
 - Adhere strictly to separation distances between tanks, boundaries, and sources of ignition as per regulations (e.g., UK HSE).
 - The tank and piping should be protected from vehicle impact using bollards or crash barriers.
 - Secure the facility with locked valve covers and perimeter fencing to prevent unauthorized access.
- **Systems:**

- Install a comprehensive fire protection system (water sprinklers, monitors, foam systems) and Emergency Trip Buttons (ETB) at key locations.
- Incorporate Safety Relief Valves (SRV), High-Level (HL) alarms, and high-temperature trips to prevent overfilling and over-pressurization.
- Maintain a robust Earthing and Lightning Protection system to prevent static electricity and lightning fires.
- **Operational:**
 - Develop and implement Standard Operating Procedures (SOPs) and Job Safety Analysis (JSA) for all critical tasks.
 - Implement a strict Work Permit System for maintenance and all non-routine activities.
 - Conduct regular emergency drills to ensure all personnel are trained in emergency response procedures.
- **Maintenance:** Proactive maintenance strategies (e.g., increasing Mean Time Between Failures, reducing Mean Time to Repair) are essential to minimize downtime and prevent equipment failures that could lead to leaks.

Stakeholder Engagement and Biodiversity

- **Consultation:** Conduct preliminary environmental and social impact assessments and engage in prior communication with local residents and stakeholders before establishing new sites.
- **Biodiversity:** Avoid siting the facility in environmental protection zones as defined by international agreements and domestic laws. Implement local biodiversity conservation projects, such as tree planting, to offset any residual impact.
- **Emergency Preparedness and Response**

A comprehensive Emergency Response and Disaster Management Plan (ERDMP) is non-negotiable. The plan should:

- Identify credible emergency scenarios (e.g., major leak, fire, BLEVE).
- Outline clear procedures for evacuation, communication, and mobilization of emergency services.
- Define roles and responsibilities for a crisis management team.
- Include post-incident recovery plans to return the affected area to its original condition.

- Ensure the supplier's emergency contact number is clearly displayed on the tank and known to relevant staff.

Conclusion

CB Gas aims to adhere, achieve and comply with all relevant laws and regulations including those of the Environmental Protection Agency (EPA). We intend to implement our project with minimal impact to the environment in order to establish stringent monitoring, prevention, response and reporting plans to achieve compliance for the operation of the Gas Bottling and Distribution Facility.