



ENVIRONMENTAL IMPACT ASSESSMENT: NATURAL ENVIRONMENT COMPONENT

CEC APPLICATION NO.
5702/2019

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NO. 5702/2019**

**ENVIRONMENTAL IMPACT ASSESSMENT
FOR THE ESTABLISHMENT OF A NEW
MUNICIPAL WASTE DISPOSAL FACILITY
TO INCLUDE AN ENGINEERED SANITARY
LANDFILL, MATERIAL RECOVERY
FACILITY, LEACHATE COLLECTION AND
TREATMENT FACILITY AND ASSOCIATED
INFRASTRUCTURE ON 75 HECTARES OF
LAND AT KANGAWOOD ROAD, FORRES
PARK, CLAXTON BAY**



ECOENGINEERING CONSULTANTS LIMITED

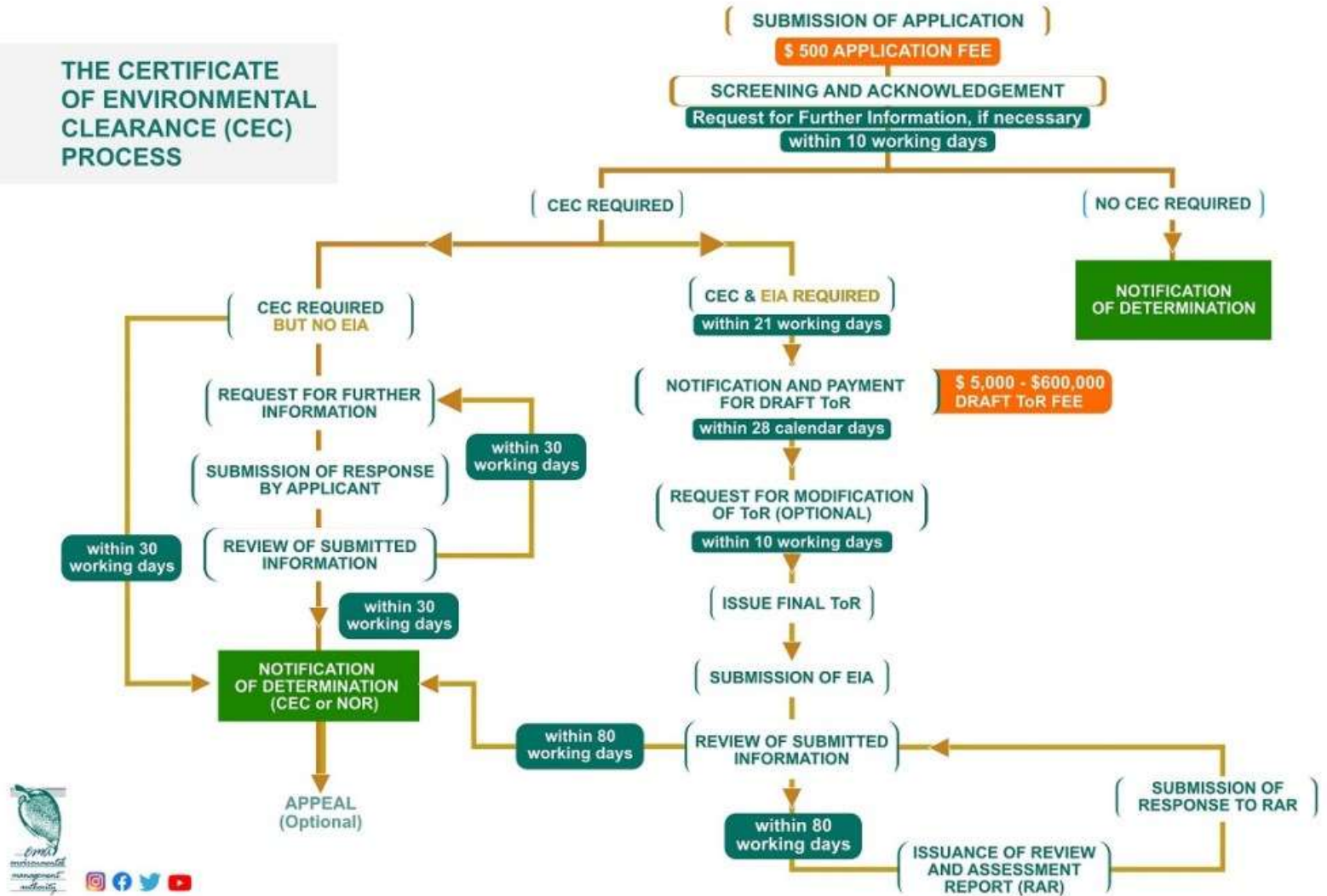
- ❖ Founded in 1991
- ❖ One of the pioneers in the Implementation of EIAs in the West Indies
- ❖ Undertakes Environmental Impact Assessments (EIAs) and other Environmental Studies
- ❖ Considerable Experience on Environmental Studies in Trinidad and Tobago and throughout the West Indies / CARICOM Region.

OTHER FIRMS AND SPECIALISTS ON THE NATURAL ENVIRONMENT COMPONENT

- Alpha Engineering and Design Limited, Hydrologists
- Trintoplan Consultants Limited, Geotechnical Engineers
- Kaizen Environmental Services (Trinidad) Limited, Air/Noise and Water Quality Monitoring
- Coastal Dynamics Limited, Air Dispersion Modelling
- Shamrock HSE, Risk Assessment
- Mr. Imran Khan, Ecologist
- Ms. Alison King, Climate Change Specialist

SUMMARY OF CEC APPLICATION PROCESS

THE CERTIFICATE OF ENVIRONMENTAL CLEARANCE (CEC) PROCESS





THE APPROACH TO THE NATURAL ENVIRONMENT COMPONENT |

COMPONENTS OF THE NATURAL ENVIRONMENT

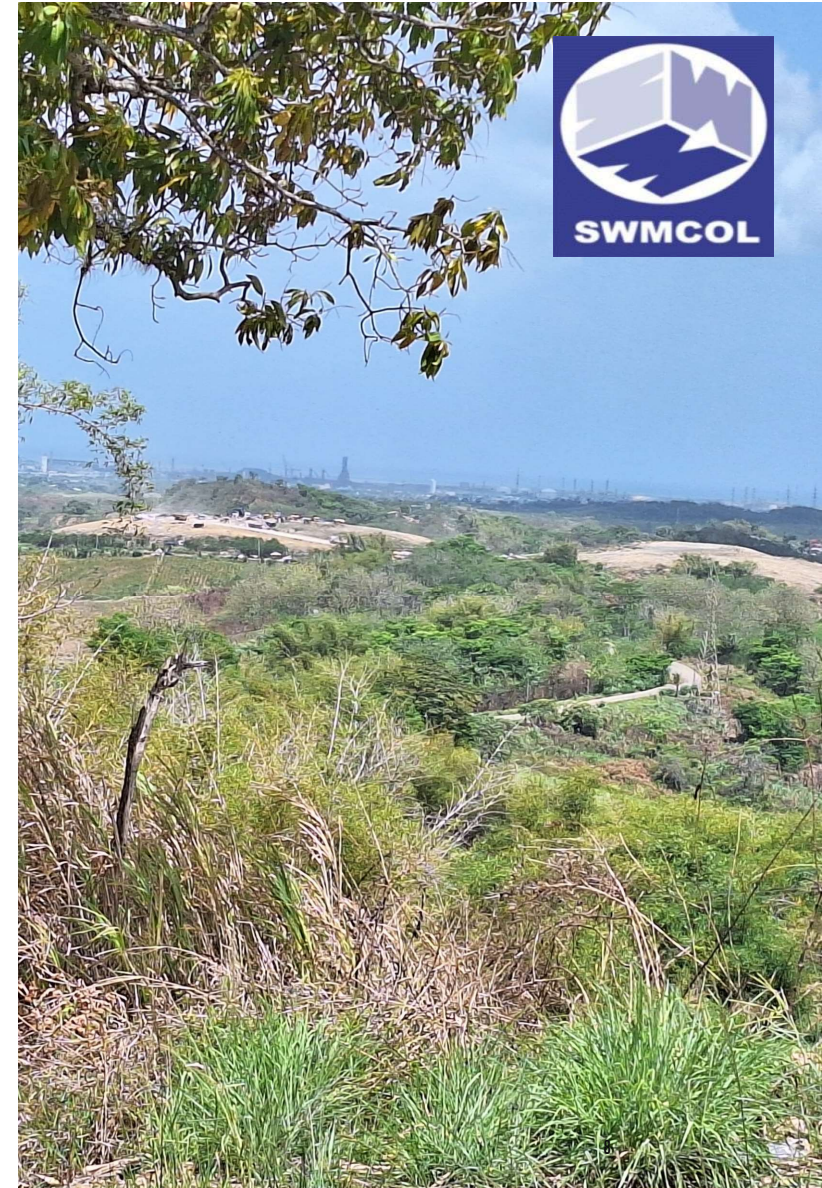


- ❑ **The Physical Environment**, consisting of Climate, Air Quality, Water Quality, Noise, Topography, etc.
- ❑ **The Biological Environment**, also called Ecology, consisting of Plants, Animals, microbes, etc. Some such species are classified as Environmentally Sensitive.

THE NATURAL ENVIRONMENT

Natural Environment Components of the EIA include the following:

- ☐ Definition of the Study Area
- ☐ Assembly of Available Data
- ☐ Baseline Studies
- ☐ Description of the Natural Environment (Physical and Biological)
- ☐ Identification of Potential Impacts
- ☐ Recommendation of Mitigation Measures
- ☐ Design of a Management System



SOURCES OF AVAILABLE INFORMATION

- Literature Review
- Studies previously conducted on this assignment, including the following:
 - Traffic Reports
 - Final Concept Design Report
 - Preliminary Geotechnical Report
 - Trinidad Solid Waste Management Program
 - Waste Characterization and Centroid Study Report – Final Report
 - GPS/Topographic/Aerial/Hydrographic Report
 - Environmental Assessment Report



ENVIRONMENTALLY APPROPRIATE
DEVELOPMENT FOR THE CARIBBEAN

SOURCES OF AVAILABLE INFORMATION

Consultation with Key Stakeholders including the following:

- Government Agencies
- Area Residents
- Local Experts
- Community Groups
- Utilities
- Emergency Services
- Other Key Stakeholders



ORIGINAL DATA COLLECTION

Project Specific Studies include the following:

- Ambient Air Quality Monitoring (seasonal)
- Water Quality Monitoring (seasonal)
- Noise Monitoring
- Soil Quality
- Artificial Light Surveys
- Hydrology (Peak Flow Calculations)
- Terrestrial and Aquatic Ecology (seasonal)



DESCRIPTION OF THE NATURAL ENVIRONMENT

- This section is currently in development and will be finalized following the completion of all project related specialized studies.
- The final version of the Description of the Natural Environment will be used for the development of Potential Environmental Impacts and associated Management Options.
- For this first public meeting, a list of Potential Environmental Impacts and Management Options were generated, based on:
 - Anticipated project works and occupancy activities
 - An initial understanding of the Natural Environment Setting of the project site; and
 - Experience on past projects, of a similar nature
- A finalized list of Potential Environmental Impacts and associated Mitigation Measures will be presented at the second public meeting for this EIA.



Summary of Potential Environmental Impacts and Management Options (Construction Phase)



- The Information Handout contains a preliminary identification of potential natural environmental (physical and biological) concerns and applicable management options, for the construction phase.
- Management options presented in the Handout are those that are most likely to be implemented.
- The tables below list selected Concerns and Management Options to illustrate this approach.

SELECTED / TYPICAL POTENTIAL ENVIRONMENTAL IMPACTS AND MANAGEMENT OPTIONS (CONSTRUCTION PHASE)



Potential Environmental Impact	Management Options
Physical Environment	
<ul style="list-style-type: none"> On-Site Erosion and Slope Instability Impaired Water Quality (Siltation/Sedimentation) 	<ul style="list-style-type: none"> To the extent practical, conduct major earthworks during the dry season. When clearing areas, maintain natural vegetation to the extent practical. Areas not required for construction works should not be cleared. Identify soil properties, engineering constraints and design criteria, especially where new roads are to be constructed. Adequately compact internal roads to reduce loose soil from being washed away during periods of heavy rainfall.
<ul style="list-style-type: none"> Altered Drainage 	<ul style="list-style-type: none"> Conduct hydrology calculations to inform the design and construction of adequately sized drains to reduce the potential for flooding. Keep drainage paths clear of cut vegetation and other debris. To the extent practical, conduct major earthworks during the dry season.
<ul style="list-style-type: none"> Impaired Air Quality (Dust, Exhaust Emissions, Asphalt Fumes) 	<ul style="list-style-type: none"> Properly service all construction equipment/machinery and transport vehicles to ensure that there are no visible sooty emissions. Optimize trips bringing material and/or transporting waste from the site, by ensuring that the use of part-filled trucks is minimized to the extent practical. Turn off all engines from vehicles and equipment when not in use to reduce exhaust emissions into the atmosphere. Cover the tray of all transport vehicles (with tarpaulins, etc.) transporting cover material to the site to prevent material flying up from the load into the air as dust. Inform nearby residents as to when paving of roads will occur. Dust control measures (compaction and frequent wetting) should be implemented along access roads and other bare surfaces.

SELECTED / TYPICAL POTENTIAL ENVIRONMENTAL IMPACTS AND MANAGEMENT OPTIONS (CONSTRUCTION PHASE)



Potential Environmental Impact	Management Options
<i>Biological Environment</i>	
Loss of Terrestrial Vegetation	<ul style="list-style-type: none"> When clearing areas, maintain natural vegetation to the extent practical. Areas not required for construction works should not be cleared.
Disturbance to Terrestrial Fauna	Implement Management Options to reduce potential adverse impacts of Impaired Air Quality, Artificial Light and Noise and Vibration during the Construction Phase (see Handout).
Disturbance to Benthic Communities	Implement Management Options to reduce potential adverse impacts of Impaired Water Quality during the Construction Phase (see Handout).



Summary of Potential Environmental Impacts and Management Options (Operation Phase)



- The Information Handout contains a preliminary identification of potential natural environmental (physical and biological) concerns and applicable management options, for the operation phase.
- Management options presented in the Handout are those that are most likely to be implemented.
- The tables below list selected Concerns and Management Options to illustrate this approach.

SELECTED / TYPICAL POTENTIAL ENVIRONMENTAL IMPACTS AND MANAGEMENT OPTIONS (OPERATION PHASE)



Potential Environmental Impact	Management Options
<i>Physical Environment</i>	
<ul style="list-style-type: none"> Slope Instability 	<ul style="list-style-type: none"> Site slopes should be maintained to not exceed slopes greater than 3:1.
<ul style="list-style-type: none"> Impaired Groundwater Quality 	<ul style="list-style-type: none"> The engineered sanitary landfill will be underlined by an engineered liner system. This minimizes the infiltration of contaminants into the subsurface soil, thereby reducing the potential of groundwater contamination.
<ul style="list-style-type: none"> Impaired Air Quality (Exhaust Emissions, Landfill Gas Emissions, Dust, Smoke Emissions) 	<ul style="list-style-type: none"> Design and install a landfill gas control system. Properly service all construction equipment/machinery and transport vehicles to ensure that there are no visible sooty emissions. Optimize trips bringing material and/or transporting waste from the site, by ensuring that the use of part-filled trucks is minimized to the extent practical. Turn off all engines from vehicles and equipment when not in use to reduce exhaust emissions into the atmosphere. Cover the tray of all transport vehicles (with tarpaulins, etc.) transporting cover material to the site to prevent material flying up from the load into the air as dust. Inform nearby residents as to when paving of roads will occur. Dust control measures (compaction and frequent wetting) should be implemented along access roads and other bare surfaces.

SELECTED / TYPICAL POTENTIAL ENVIRONMENTAL IMPACTS AND MANAGEMENT OPTIONS (OPERATION PHASE)



Potential Environmental Impact	Management Options
<i>Physical Environment</i>	
<ul style="list-style-type: none"> Impaired Water Quality (Hydrocarbons, Solid Waste, Sewage, Landfill Leachate) 	<ul style="list-style-type: none"> Implementation of a surface water quality monitoring program. Prohibit the disposal of hydrocarbons in the landfill. As far as practical, equipment re-fuelling should be done off-site. Where necessary, fuelling on-site should be done at a minimum of 30 m away from any water body, at a designated area. Properly place and compact solid waste. Design and install a suitable leachate collection system.
<ul style="list-style-type: none"> Noise 	<ul style="list-style-type: none"> Ensure that noise and vibration-generating equipment are routinely inspected, maintained and repaired to reduce unnecessary increases in noise levels. If night work is necessary, a Variation Certificate under the Noise Pollution Rules from the EMA should be requested. Inform the public of noisy construction activities in the area.
<ul style="list-style-type: none"> Artificial Light 	<ul style="list-style-type: none"> Night-time lighting in built areas should only be used to the extent practical; Use shielded and downward focused lighting fixtures.

SELECTED / TYPICAL POTENTIAL ENVIRONMENTAL IMPACTS AND MANAGEMENT OPTIONS (OPERATION PHASE)



Potential Environmental Impact	Management Options
<i>Biological Environment</i>	
• Disturbance to Terrestrial Fauna	Implement Management Options to reduce potential adverse impacts of Artificial Light and Noise during the Operation Phase (see Handout).
• Disturbance to Benthic Communities	Implement Management Options to reduce potential adverse impacts of Impaired Water Quality during the Operation Phase (see Handout).



SPECIALIZED STUDIES



- **Risk Assessment**: focuses on project consequences that have a low likelihood of occurrence but usually high consequences.

- **Environmental Management Plan**: for **Each Mitigation Measure**, it lists -
 - Nature,
 - Timing,
 - Responsibility for Implementation, and
 - Responsibility for Verification.



Concluding Comments on the Natural Environment Component



- The site includes elements of the Terrestrial Environment
- Ecoengineering Consultants and the Project Team have the capability to:
 - Describe these Elements,
 - Identify and Assess Potential Environmental Impacts,
 - Recommend Mitigation Measures, and
 - Design Management Systems.