

Project Brief for Relocation of Hazardous Waste Incinerator to Ferry, St. Andrew (Addendum)

Submitted to:



Submitted by:



In association with



April 2019

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Table of Contents

Proprietary Restriction Notice	1
List of Tables.....	3
List of Figures	3
1 Introduction.....	4
1.1 Background.....	4
1.2 Motivation and Previous Operations: Previous Waste Streams and loads.....	4
2 Site Description	5
2.1 Location.....	5
2.2 Site Plan.....	6
2.3 Environment.....	7
2.3.1 Topography and Soils	7
2.3.2 Flood prone	7
2.3.3 Wells and Surface Waters.....	7
3 Proposed Use, Benefits and Impacts	10
3.1 Incineration Activities	10
3.1.1 Waste Stream	10
3.1.2 Incineration	11
3.1.3 Wastewater	11
3.1.4 Storage of Hazardous Waste	12
3.1.5 Ambient Air Quality Monitoring	13
3.2 Benefits and Impacts	14
3.2.1 National benefits	14
3.2.2 Local benefits and Impacts	15
4 Appendices.....	21
4.1 Lot 31 Title.....	21
4.2 Site Plan.....	22

List of Tables

Table 1.1 Waste Categories and quantities that have been disposed of via the COCL Mobile Hazardous Waste Incinerator to date	4
Table 2.1 Well information for Ferry Pen surrounding area.....	7
Table 3.1 Annual Capacity for the Hazardous Waste Facility for various waste streams	10
Table 3.2 Waste Characterization for the various waste streams to the Hazardous Waste Facility.....	10
Table 3.3 Incineration Operation Specifications.....	11
Table 3.4 Monitoring plan – parameters and frequency – for proposed Ferry Pen Facility	13
Table 3.5 Average stack emission data for SGW and MW	17

List of Figures

Figure 2.1 Location Map for Ferry Property	5
Figure 2.2 Site Plan for Lot 31 Ferry Pen	6
Figure 2.3 Photos of Lot 31 Ferry Pen	7
Figure 2.4 Map of Ferry Pen property showing the topography, wells and flood prone areas	9
Figure 3.1 Schematic diagram outlining water and wastewater flows to and from the incinerator	11
Figure 3.2 Established wastewater recycle system at hazardous waste facility	12
Figure 3.3 Modified IBC containers being used for Hazardous Waste Storage	12
Figure 3.4 Ambient Air Quality Monitoring Station	13
Figure 3.5 Excerpt from COCL Medical Waste Survey (2018).....	14
Figure 3.6 Wind rose plot for Lot 31 Ferry Pen	15
Figure 3.7 Wind rose for day time (6am – 6 pm) conditions at Ferry Pen (left) Wind rose for night time (6pm – midnight) conditions at Ferry (right).....	16
Figure 3.8 Spanish Town Road study corridor	16
Figure 3.9 PM10 concentration for Spanish Town road study corridor (left) Hourly SO2 concentration for Spanish town Road study corridor (right)	17
Figure 3.10 Average stack emission data for SGW and MW.....	17
Figure 3.11 PM10 day diffusion of point-source pollution using a gaussian distribution (top) SOx day diffusion of point-source pollution using a gaussian distribution(bottom)	18
Figure 3.12 NOx day diffusion of point-source pollution using a gaussian distribution.....	19
Figure 3.13 PM10 night diffusion of point-source pollution using a gaussian distribution	19
Figure 3.14 SOx night diffusion of point-source pollution using a gaussian distribution (top) NOx night diffusion of point-source pollution using a gaussian distribution (bottom)	20

1 Introduction

1.1 Background

CEAC Outsourcing Co. Ltd (COCL) was granted an Environmental Permit (2018-13017-EP00015) to construct and operate a waste incinerator facility at New Yarmouth Estate, Clarendon. This was part of the pilot phase of the project in which COCL was allowed to conduct incineration of sludge and obsolete chemicals from J. Wray and Nephew, ship-generated (food) waste and Medical Waste. Since the completion of the pilot phase of the project COCL is seeking to find a temporary base for the operations of the Waste Incinerator. COCL has been in discussions with the agency to develop a permanent base at Sheckles, Clarendon. However, in the interim COCL is seeking to relocate the incinerator to Lot 31 Ferry Pen for a period of four (4) – eight (8) months.

COCL currently owns Lot 31 Ferry Pen (Vol/Fol: 1518/753), which is scheduled to be developed to a Business Process Outsourcing (BPO) facility. The building has not yet been constructed and in the interim COCL is proposing to utilize a portion of the lot for the storage and operation of the incinerator, until the building is completed and ready for tenancy. At that point the incineration operations will cease. The proposed activities at the Ferry location will include the storage and incineration of medical waste and ship generated waste (food), twenty-four (24) hours per day seven (7) days per week.

1.2 Motivation and Previous Operations: Previous Waste Streams and loads

Currently, there is both an absence of adequate medical waste and ship-generated waste treatment facilities across Jamaica. Additionally, Jamaica has a treaty obligation under the MARPOL Convention to handle SGW. MW requires incineration or autoclaving and the current facility in Kingston is inadequately sized and incapable of handling certain types of MW. SGW requires incineration, rather than burial, to prevent the transmission of veterinarian diseases to local life stock. Home porting cruise ships to Jamaica require these services and Jamaica is still not compliant with these requirements. Both of these issues have been (on a case by case level) and can be addressed with the proposed services by COCL.

COCL has experience handling MW, SGW and Hazardous Waste streams, from national and private hospitals and the shipping industry, successfully.

Table 1.1 Waste Categories and quantities that have been disposed of via the COCL Mobile Hazardous Waste Incinerator to date

Waste Category	Waste Type	Source	Quantities Treated (kg)
Ship-generated Waste	Frozen Food	1. Golar Arctic	5,135.50
Medical Waste	Infectious & Sharps	1. Falmouth Hospital 2. Mandeville Regional Hospital 3. St. Ann's Bay Hospital 4. Cornwall Regional Hospital 5. Savanna-La-Mar Hospital 6. Noel Holmes Hospital 7. St. James Public Health Services 8. Elite Diagnostic Services 9. Radiology West 10. JSPCA 11. Edgewater Medical Centre 12. Bodles Research Centre	21,212.02
Hazardous Waste	Industrial Waste o Sludge o Obsolete chemicals	1. Campari (J. Wray and Nephew)	67,643.99

2 Site Description

2.1 Location

The subject property is located along the Mandela Highway, access to the lot is through Tom Cringle Drive. The site can be described as follows:

1. Parcel reference
 - a. Volumes and Folio: 1518:753 Lot 31 Ferry Pen, St. Andrew. CEAC Outsourcing Co. Ltd.
 - b. Location: (UTM) 302736.00 m E; 1994365.00 m N
2. Area: 0.9 acres
3. Distance to nearest residents:
 - a. North East: 290 metres to Tankweld and CHEC facilities
 - b. East: 650 metres to New Haven Community
 - c. South East: 173 meters to Nestle Facility
 - d. South West: 690 meters to Ferry Community



Figure 2.1 Location Map for Ferry Property

2.2 Site Plan

Currently at the site is the foundation/concrete pad for the BPO building. The incinerator will be located in the back-left corner of the lot 10 feet from the western boundary wall and 5 feet from the northern boundary wall. In front of the incinerator (approximately 17 feet) will be an IBC storage area for the waste (SGW and MW) on a bunded concrete pad. The incinerator and storage area will be 47 – 51 feet from the existing concrete pad for the BPO building. Parking for the waste collection truck will be available alongside the western boundary wall in front of the IBC storage containers. The incinerator and storage area will be 47 – 51 feet from the existing concrete pad for the BPO building. Parking for the waste collection truck will be available alongside the western boundary wall in front of the IBC storage containers.

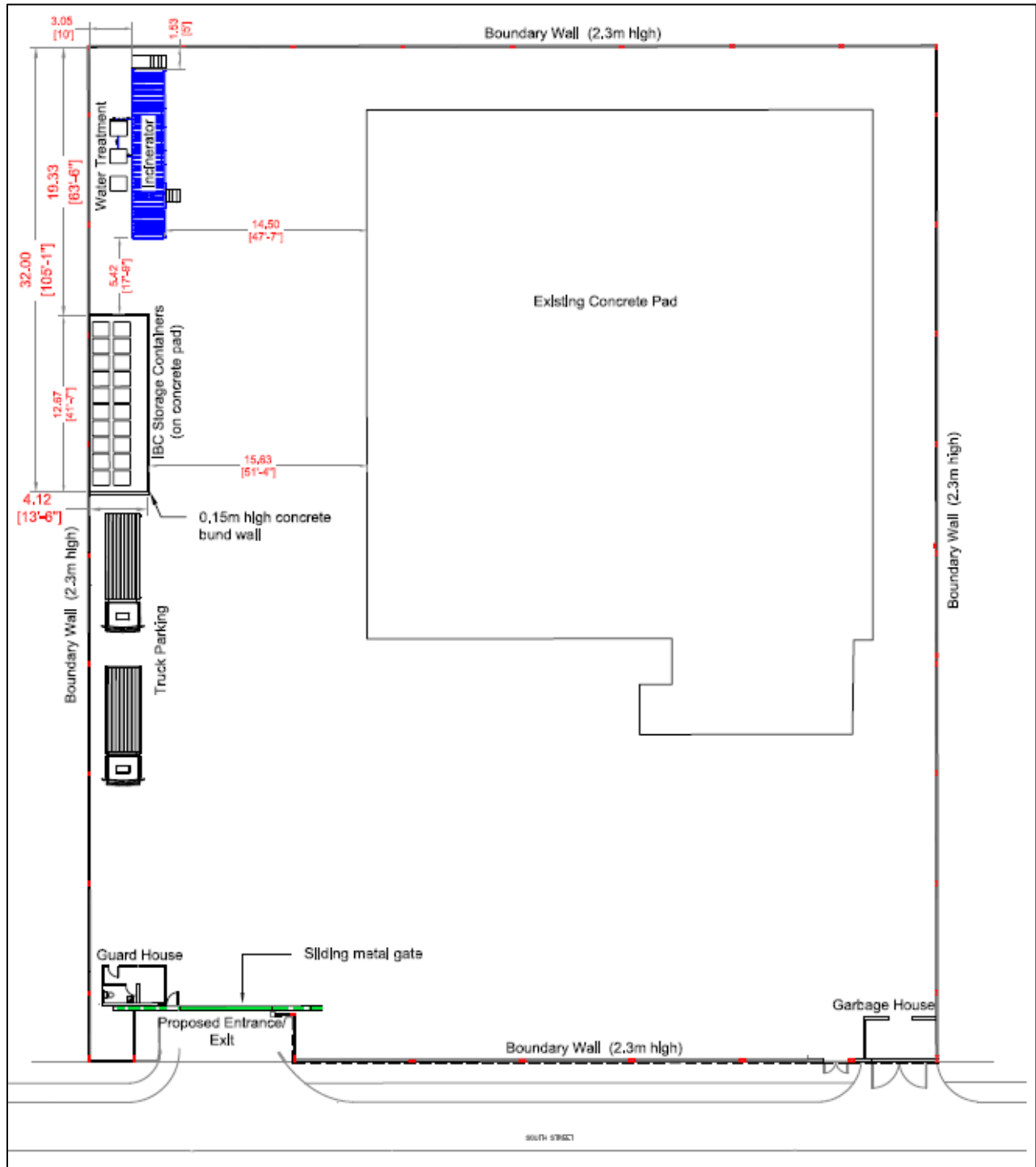


Figure 2.2 Site Plan for Lot 31 Ferry Pen



Figure 2.3 Photos of Lot 31 Ferry Pen

2.3 Environment

2.3.1 Topography and Soils

Majority of the soil at the Lot 31 Ferry Pen site, is dark brown, soft silty clay. Piles have been placed in the soil to prevent settlement of the building.

2.3.2 Flood prone

Ferry Pen is not an identified ODPEM flood prone area however, it should be noted that the lot has been filled to 4.5m above MSL and as such flooding should not be an issue for the site.

2.3.3 Wells and Surface Waters

There are four (4) wells located in the Ferry area however, none of these wells are located in the vicinity of the proposed incinerator site. The Duhaney River is located 613 m to the east of the lot.

Table 2.1 Well information for Ferry Pen surrounding area

Field	Values				
ID WELLS	253	432	563	8	119

WELLS NAME	Ferry	Ferry	Ferry Cow Park B	Ferry CH 1	Ferry Hill CH
WELLS CODE	255	435	566	8	121
FID	258.000000	437.000000	568.000000	13.000000	124.000000
CODE	255.000000	435.000000	566.000000	8.000000	121.000000
OWNER	Liquid Carbonic Co.	Caymanas Estate Ltd.	National Irrigation Commission	Water Resources Authority	Water Resources Authority
DMS LIC NO	A2010/41				
PARISH IN	St. Catherine	St. Catherine	St. Catherine	St. Catherine	Kingston & St. Andrew
HYDROBASIN	Rio Cobre	Rio Cobre	Rio Cobre	Rio Cobre	Rio Cobre
WATERSHED	Rio Cobre	Rio Cobre	Rio Cobre	Rio Cobre	Rio Cobre
WELL STATE	Pumping	Non-Pumping			
WELL USE	Industrial				
WELL TYPE		Corehole			
ELEVATION		22.76 feet	45.02 Feet		
WELL DEPTH	55 Feet	110 feet	107 Feet	60 Feet	400 Feet
WATERSTRU	13.000000	0.000000	30.000000	0.000000	0.000000
AQUIFER	Alluvium	Alluvium	Alluvium	Alluvium	Limestone
RESTWATER	11.000000	19.000000	29.000000	0.000000	6.000000
VERIFIED W		Yes			
REMARKS					
LONGITUDE	-76.877000	-76.883700	-76.906000	-76.858800	-76.877200
LATITUDE	18.024500	18.017200	17.991300	18.019100	18.034200



Figure 2.4 Map of Ferry Pen property showing the topography, wells and flood prone areas

3 Proposed Use, Benefits and Impacts

3.1 Incineration Activities

3.1.1 Waste Streams

The hazardous waste facility would dispose of Medical Waste from various hospitals, medical/dental clinics, laboratories and research facilities around the island. Ship Generated Waste (SGW) from Cruise ships will also be disposed of by incineration. The facility will also dispose of Industrial Waste (sludge & obsolete chemicals). Table 3.1 shows the annual loads for the various waste streams.

Table 3.1 Proposed Annual Capacity for the Hazardous Waste Facility for various waste streams

Waste Streams	Annual Capacity (Tonnes/year)
Medical Waste, excluding waste streams that contain radioactive wastes and heavy metals	150
Ship-generated food Waste	153
Industrial waste (sludge and obsolete chemicals) as per manufacturer's list of suitable items ¹ for incineration and other industrial waste subject to identification and confirmation of incinerator capacity on a case by case basis, excluding Mercury and other heavy metal compounds	50
Total proposed capacity	353
Capacity of System	357.12

Table 3.2. Detailed waste characterization of Medical and ship-generated waste streams to the Hazardous Waste Facility

Waste Stream	Characterization
Medical Waste	<p>According to the NEPA Medical Waste Policy Medical waste can be divided into eight categories:</p> <ol style="list-style-type: none"> Infectious Waste: waste contaminated with blood and other bodily fluids (e.g. from discarded diagnostic samples), cultures and stocks of infectious agents from laboratory work (e.g. waste from autopsies and infected animals from laboratories), or waste from patients in isolation wards and equipment (e.g. swabs, bandages and disposable medical devices); Pathological Waste: human tissues, organs or fluids, body parts and contaminated animal carcasses; Sharps: syringes, needles, disposable scalpels and blades, etc.; Chemicals: for example, solvents used for laboratory preparations, disinfectants but excluding heavy metals contained in medical devices (e.g. mercury in broken thermometers) and batteries; Pharmaceuticals: expired, unused and contaminated drugs and vaccines; Genotoxic waste: highly hazardous, mutagenic, teratogenic or carcinogenic, such as cytotoxic drugs used in cancer treatment and their metabolites, excluding radioactive waste. Non-Hazardous or General Waste: waste that does not pose any particular biological, chemical, radioactive or physical hazard <p>Radioactive waste will NOT be accepted by COCL for Incineration.</p>
Ship Generated Waste	The Hazardous Waste facility will incinerate Annex V: Garbage Specifically, food waste, cooking oils and bones from the food waste.

¹ Inciner8 List of Suitable Items for incineration in INCER-I8-140
Submitted to: NEPA

3.1.2 Incineration

Incineration will be conducted seven (7) days per week 24 hours per day. The incinerator will be shut down weekly for approximately 8 hours in order to conduct preventive maintenance work on the incinerator and the adjoining equipment. The facility will be closed on public holidays. Table 3.3 shows the operating specifications for the incinerator.

Table 3.3 Incineration Operation Specifications

Burn Rate	60 kg/hr
Max. Operating Hours per day	24 hr/day
Daily Burn Rate	1440 kg/day
Lost Time - % Maintenance	10%
% Transporting	5%
Non-working days	17%
Max. operating days per year	248 days
Annual Capacity	357.12 Tonnes/year

3.1.3 Wastewater

The venturi scrubber utilizes 1 L/min, therefore for incinerating for 24 hours per day the total wastewater generated is 1440 L/day (1.44 m³/day). Two 250 US gallon IBC water containers will be placed in the facility, one container will be feeding fresh water to the venturi scrubber and the other container will house the scrubber wastewater. The wastewater will be allowed to settle to remove any solid particles. The wastewater will be mixed with the fresh water which is then pumped through a series of filters and then to the scrubber. The settled wastewater will be recycled to the scrubber until the water is spent. In determining when the scrubber wastewater is spent the following procedure will be applied:

1. Air emissions will be monitored to ensure compliance.
2. If air emission levels are trending to be compromised, then the saturation of dissolution gases will be assumed and the water will be stored for discharge to the WWTP.

A schematic diagram outlining the sequence of waste water flows from the incinerator is presented in Figure 3.1 and Figure 3.2. The fresh water, scrubber wastewater and the spent wastewater will all be stored in 250 US gallon IBC tanks. The Spent scrubber wastewater tank will be transferred to a septic tank for storage. When the sump is full it will be emptied by a cesspool emptier.

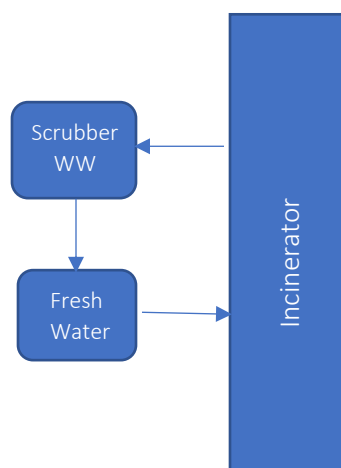


Figure 3.1 Schematic diagram outlining water and wastewater flows to and from the incinerator



Figure 3.2 Established wastewater recycle system at hazardous waste facility

3.1.4 Storage of Hazardous Waste

After the collection of medical waste and ship generated waste it will be stored at the hazardous waste facility. The medical waste will be stored in modified 250 US gallon IBC containers. Whereas the Ship Generated Waste will be stored in a refrigerated container to eliminate the exposure to vectors. The waste storage containers will be stored on a bunded concrete pad. In the event of a spill the bunded area will be washed down using soap, water and a 5% bleach solution. The bund will be emptied via cesspool truck.



Figure 3.3 Modified IBC containers being used for Hazardous Waste Storage

3.1.5 Ambient Air Quality Monitoring

COCL is proposing to move the ambient air quality monitoring equipment from the current location in Clarendon, to the Ferry location for monitoring during the operations at the site. COCL is proposing UTM 302644.56 m E 1994492.96 m N, alongside the current contractor site office. The monitoring plan for the Ferry Pen facility is detailed in Table 3.4. The ambient air will be monitored monthly at one station. Stack monitoring will also be conducted at the Ferry Facility. The stack will be monitored hourly for NO_x, SO_x, CO and CH₄.

Table 3.4 Monitoring plan – parameters and frequency – for proposed Ferry Pen Facility

Parameters	Frequency		Instruments
	Incineration	Post-incineration	
Ambient Air	monthly	3 days x 1 occurrence	
NOX	1 sample x 1 station	1 sample x 1 station	Model 200E Nitrogen Oxide Analyzer
SOX	1 sample x 1 station	1 sample x 1 station	Model 100E UV Fluorescence SO2 Analyzer
PM10	1 sample x 1 station	1 sample x 1 station	Airmetrics Minivol Tactical Air Samplers
Emission (in-stack)			
Temperature in primary and secondary chambers	15-minute intervals		Thermocouple
NOX	Hourly		RASI 800
SOX	Hourly		RASI 800
CO	Hourly		RASI 800
CH ₄	Hourly		RASI 800



Figure 3.4 Ambient Air Quality Monitoring Station

3.2 Benefits and Impacts

3.2.1 National benefits

3.2.1.1 Safe handling of Medical waste

Jamaica medical industry consists of over 2000 medical doctors, deployed both in the private and public sector. Currently in the island there are: 1) 129 small private medical facilities 2) 8 private hospitals 3) 348 public clinics 4) 22 Public Hospitals. Public health facilities deliver over 95% of the health care of Jamaicans. KSA accounts for ~ 1/3 of the hospitals of Jamaica. Ministry of Health pre-autoclave studies in 2003 estimated the quantity of medical waste (excluding veterinary, laboratory, pharmaceuticals and chemicals) at 1,361 kg/day.

COCL conducted market survey of 29 medical facilities approximately 31.58% dispose of their medical waste via the MOH Autoclave. However, the autoclave cannot handle the demand for medical waste disposal from all of these medical facilities. Resulting in >50% of the facilities dispose of the waste by “other” means. This is both concerning and suggestive of illegal/inappropriate means of disposal.

COCL began incinerating medical waste in October 2018 and to date have collected medical waste from eleven (11) medical facilities and incinerated 21,212.02 kg.

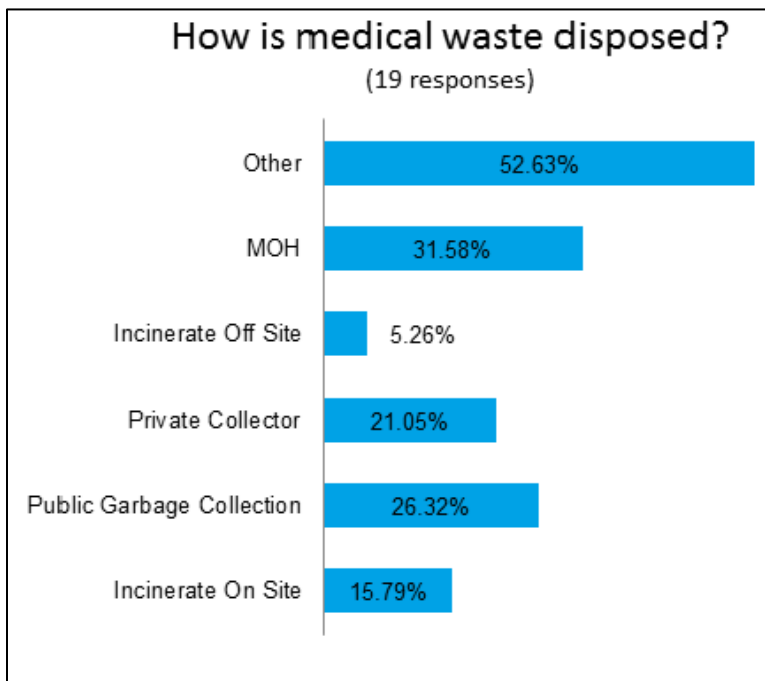


Figure 3.5 Excerpt from COCL Medical Waste Survey (2018)

3.2.1.2 Home porting cruise ships

Four (4) cruise ships (CS) home port in Jamaica that make approximately 126 calls per years. These CS potentially require waste handling services of ship-generated waste (SGW). Dominican Republic ports and others in the region currently provide these port reception facility (PRF) services. IMO GISIS: Port Reception Facilities does not have any PRF registered for Jamaica. These four homeporting CS have a waste stream of 4,659 Tonnes/year. By allowing COCL to accept the food waste (bones) from the CS this would:

1. enable Jamaica to fulfil a portion of the MARPOL 73/78 convention. This convention requires Jamaica to provide adequate reception facilities at ports to collect wastes which the ships have been required to retain on board.
2. Make Jamaica a more attractive home port facility to the major Cruise liners.

3.2.2 Local benefits and Impacts

3.2.2.1 Employment

The benefits of the hazardous waste facility include:

1. The hazardous waste facility will provide employment opportunity for five (5) – eight (8) persons, ranging from the incinerator operators to a business development manager.

3.2.2.2 Airshed and Weather Data

Proposed benefits from the operation of the incinerator at Lot 31 Ferry include:

1. COCL would move the Ambient Air Quality Monitoring Equipment from Clarendon to the Ferry Pen area for airshed monitoring during and post incineration operations. This data would be given to NEPA to add to the “Air Quality Monitoring the Jamaican Context” 2017 Study.
2. No adverse air quality issues are expected in either the day or night operations. The operations have been and are expected to be complainant at the stack and in the air shed under the likely metrological and operational conditions.

A wind rose plot showing the direction the wind is blowing from was done for the Ferry property (see Figure 3.6). When a closer look is taken at the wind classes 25.3% of the time the wind speed varies between 3.60 – 5.70 m/s in a South Easterly and Easterly direction, 23.8% of the time the wind speed exceeded 11.10 m/s in a South Easterly and Easterly direction. During the day-time the wind blows predominantly in a SE to ENE direction with average wind speeds > 11.10 m/s. During the night-time the wind direction is in a NNE to ESE direction with average wind speeds of 3.60 – 5.70 m/s (see

Figure 3.7).

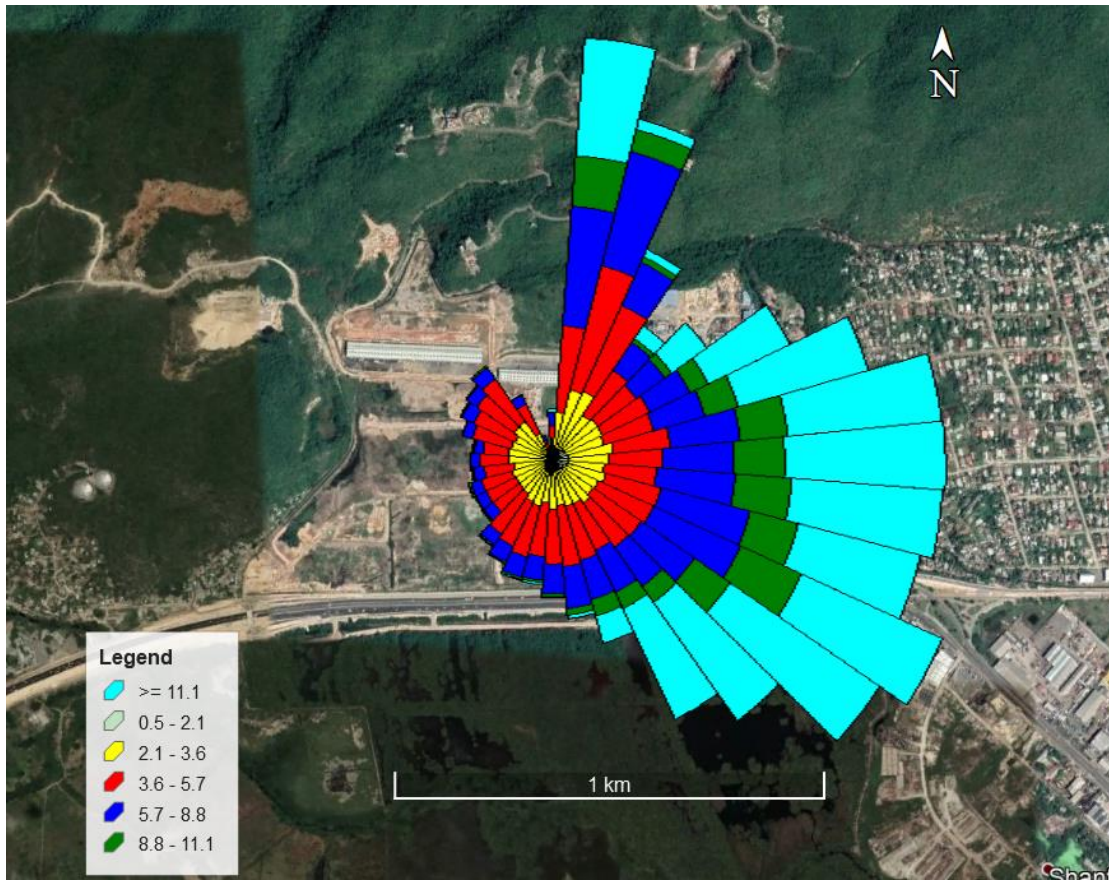


Figure 3.6 Wind rose plot (showing the direction the wind is blowing from) for Lot 31 Ferry Pen

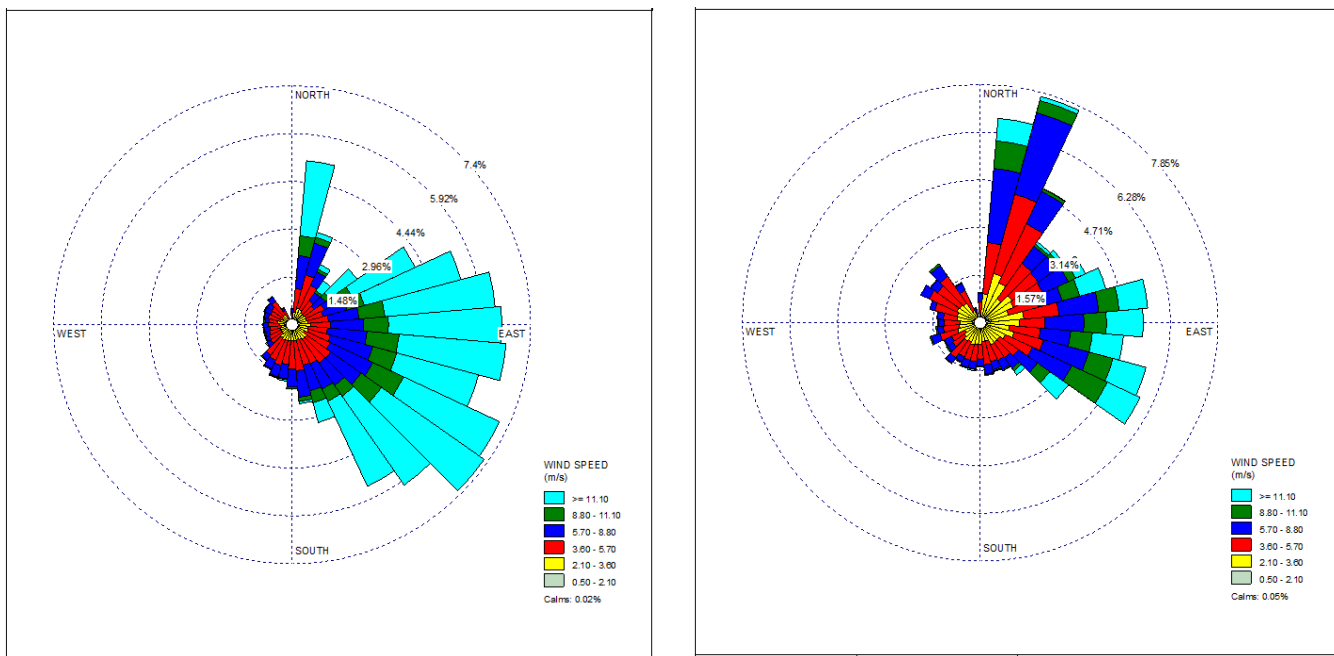


Figure 3.7 Wind rose for day time (6am – 6 pm) conditions at Ferry Pen (left) Wind rose for night time (6pm – midnight) conditions at Ferry (right)

3.2.2.3 Plume Dispersion Modelling

3.2.2.3.1 Summary of stack and airshed data

NEPA’s Air Quality Branch undertook a study of the Spanish Town Road Area (the closest monitoring location to Lot 31 Ferry Pen) from December 2013 – February 2014 along the three miles to six miles corridor. The purpose of the study was to determine the current state of air quality along the corridor. Along the corridor the PM10 average concentration ranged from 63.1 to 77.1 $\mu\text{g}/\text{m}^3$ which exceeds the JAAQS of 50 $\mu\text{g}/\text{m}^3$. The Hourly SO₂ concentration reached a maximum at 3pm – 6 pm with a concentration 105 $\mu\text{g}/\text{m}^3$. Unfortunately, there was no airshed data for the Ferry Pen area. COCL is proposing to install NO_x, SO_x, CO and PM10 monitoring equipment at the Ferry Pen location to do airshed monitoring for that area.

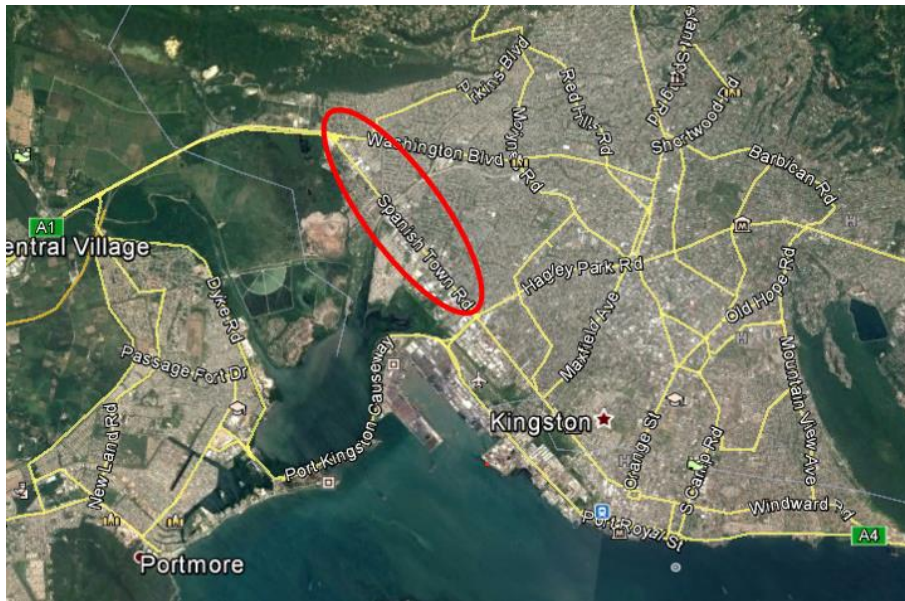


Figure 3.8 Spanish Town Road study corridor

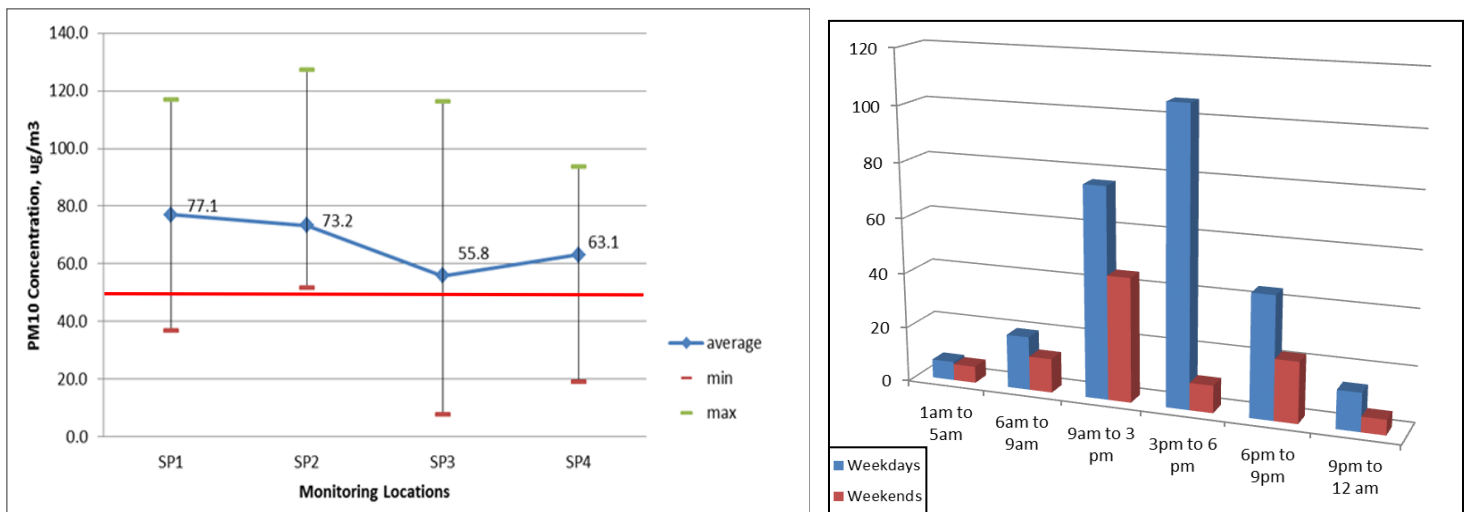


Figure 3.9 PM10 concentration for Spanish Town road study corridor (left) Hourly SO₂ concentration for Spanish town Road study corridor (right)

The COCL incinerator was in operation from August 20, 2018 – January 11, 2019. While in operation COCL incinerated Sludge, Ship-generated Waste and Medical Waste. Table 3.5 and Figure 3.10 present Stack Emission Data from the incinerator. NO_x, SO_x and CO were within the NEPA limits for both SGW and MW. CH₄ was below the NEPA limit for SGW

however, exceeded the limit for MW. This exceedance of the NEPA standard was due to test burns being conducted to determine the optimal batch size for the MW.

Table 3.5 Average stack emission data for SGW and MW

Parameter	SGW	MW	NEPA Limits
NOx (mg/m3)	41.96	24	200
SOx (mg/m3)	20.05	91	300
CO (mg/m3)	95.61	99	100
CH4 (mg/m3)	8.54	32	20

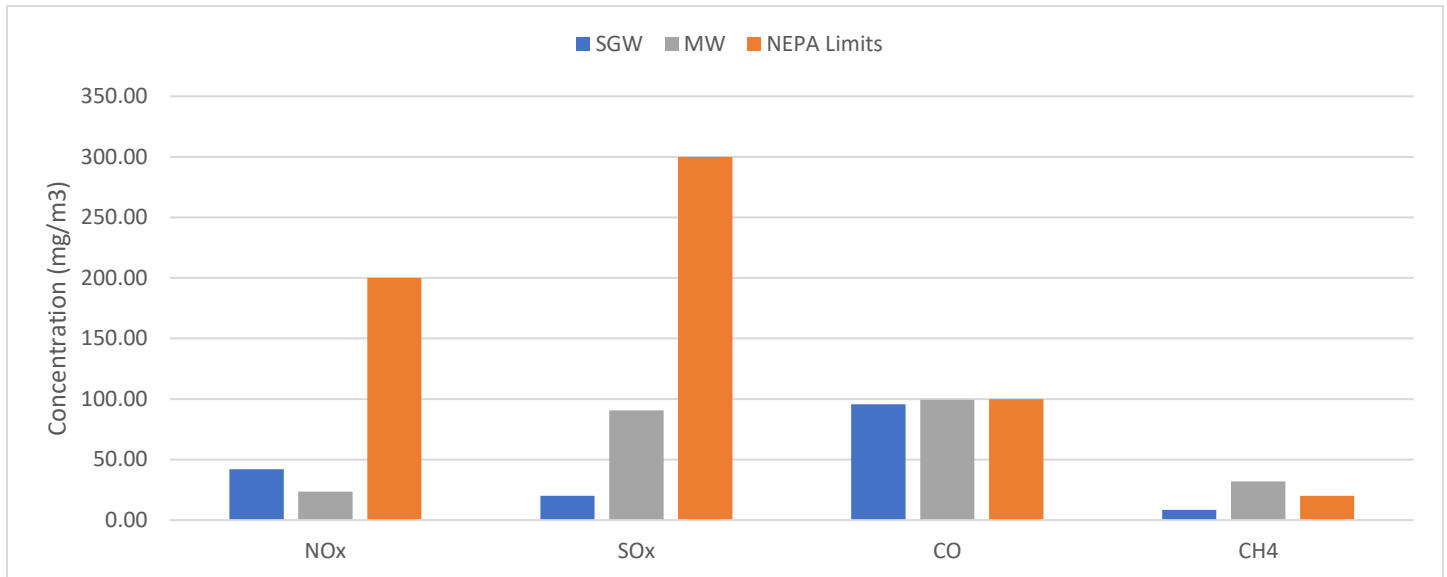


Figure 3.10 Average stack emission data for SGW and MW

3.2.2.3.2 Day-time

Plume dispersion modelling was conducted for the Ferry Pen property during the day time, using the weather data above. During the day-time (6 am – 6 pm) the average wind speeds > 11.10 m/s this corresponds to a Pasquill Gifford Stability class of C – slightly unstable. Using that information along with the stack height, gas exit velocity, emission rate and ambient temperature, the dispersion plot can be developed for incineration during the day. The emissions for the incinerator will not exceed the JAAQS for both SOx and NOx (Figure 3.11 & Figure 3.12) The fall out location for the pollutants (SOx and NOx) will be 0.08 km – 0.64 km from the source in a north westerly/westerly direction.

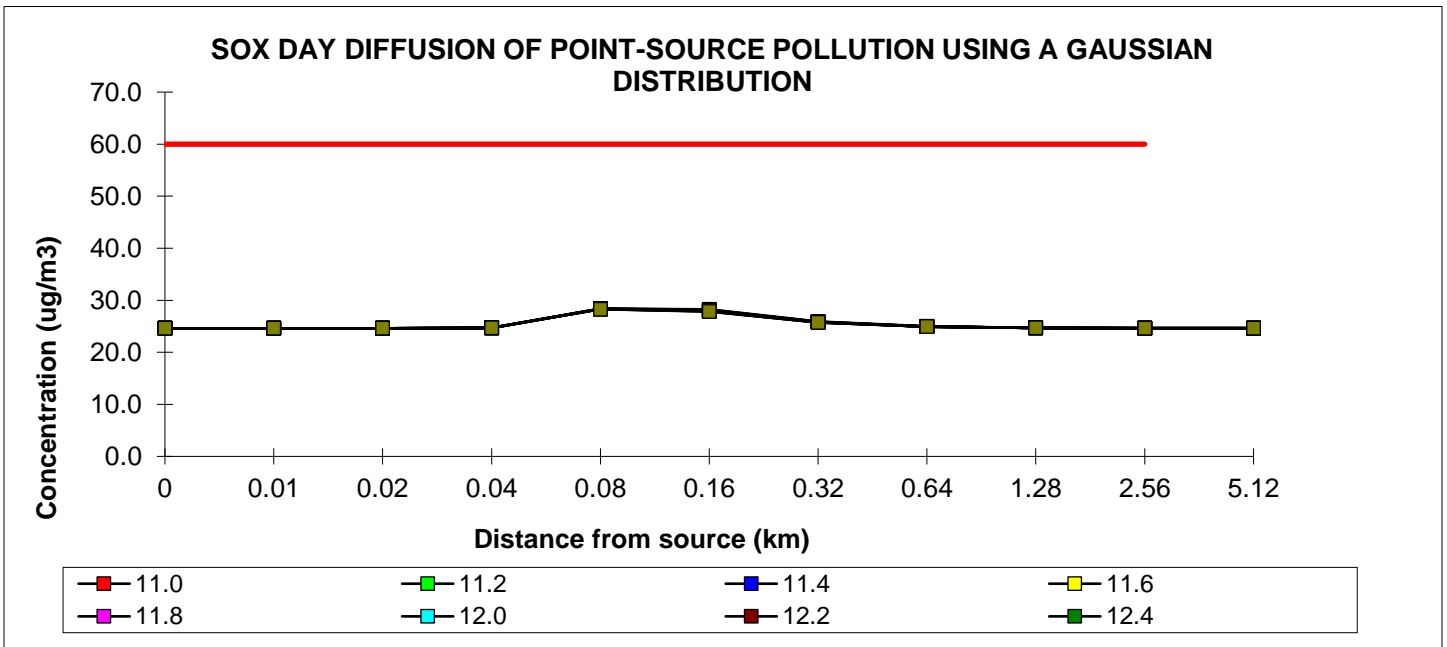
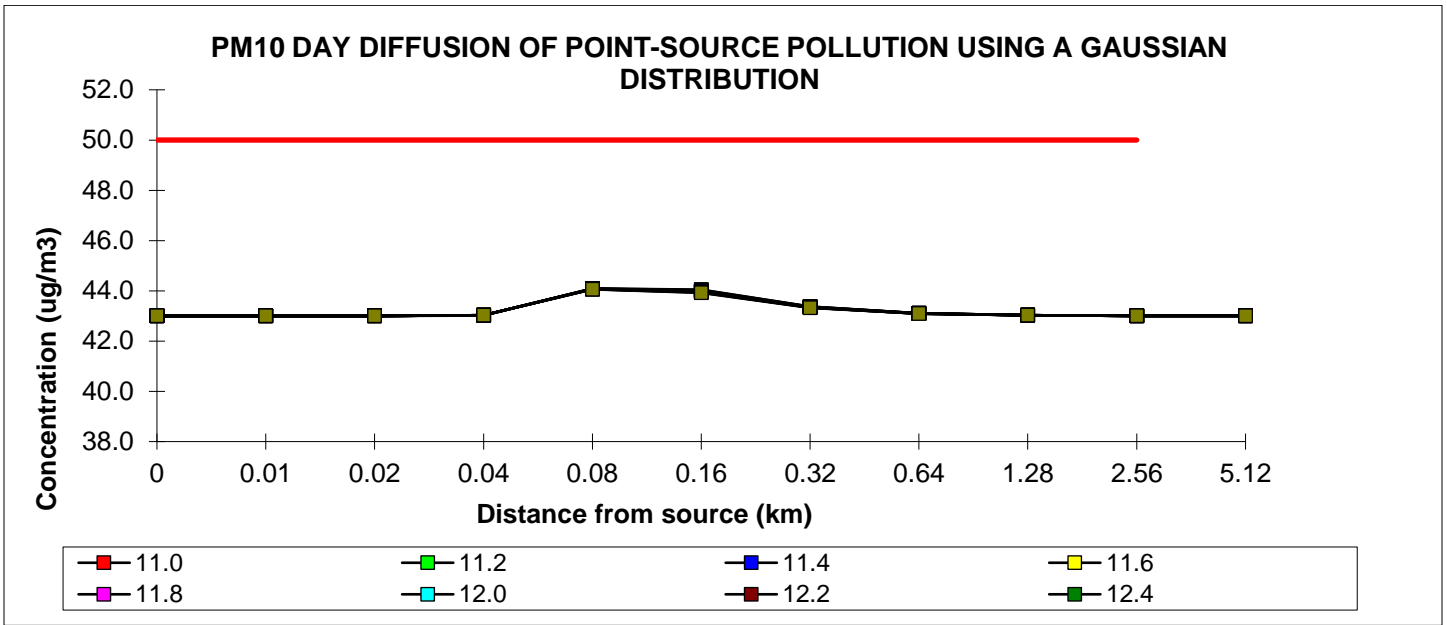


Figure 3.11 PM10 day diffusion of point-source pollution using a gaussian distribution (top) SOx day diffusion of point-source pollution using a gaussian distribution(bottom)

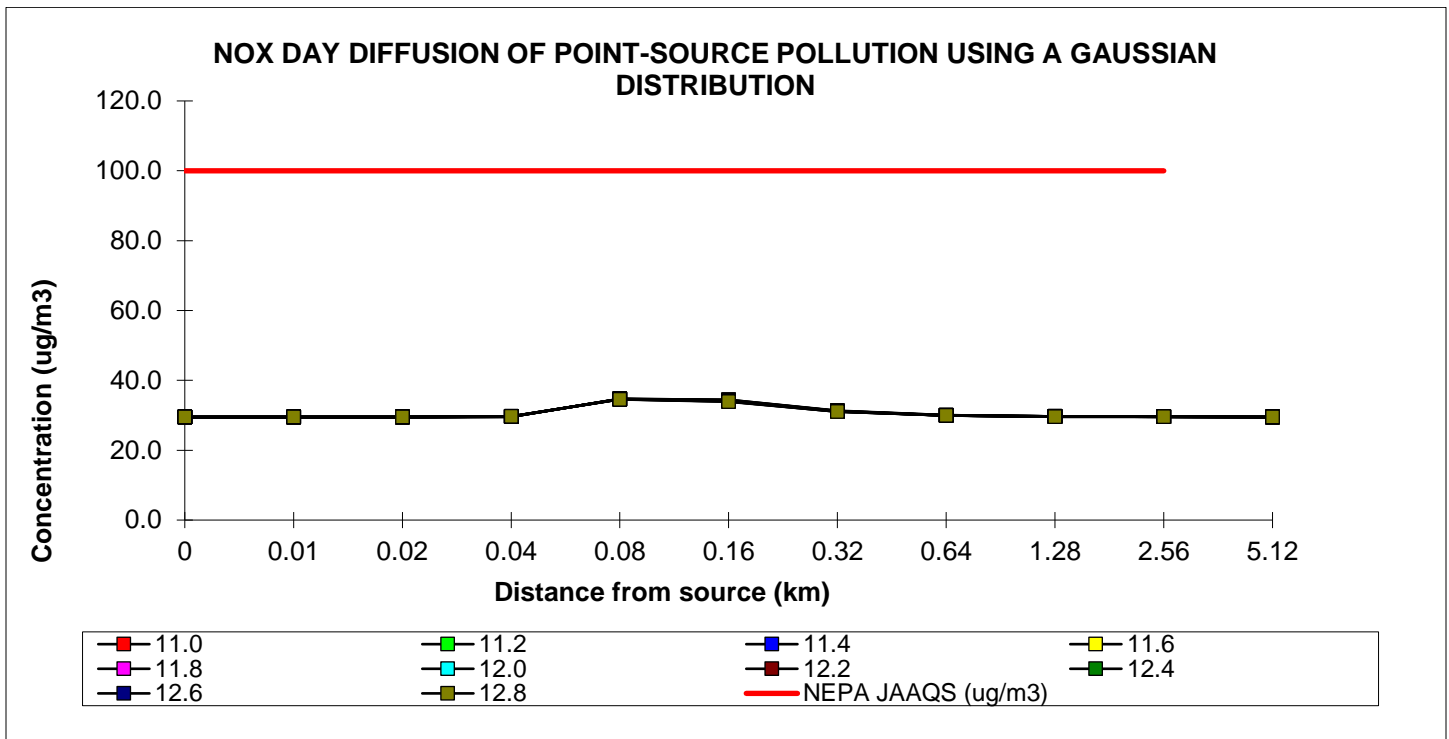


Figure 3.12 NOx day diffusion of point-source pollution using a gaussian distribution

3.2.2.3.3 Night Time

Plume dispersion for night-time conditions at Ferry Pen property was also conducted. The major difference between this modelling situation and the day-time is the atmospheric stability class. During the night-time the wind direction is in a WNW to SSW direction with average wind speeds of 3.60 – 5.70 m/s which corresponds to a stability class D – neutral. Using that information along with the stack height, gas exit velocity, emission rate and ambient temperature, the dispersion plot can be developed for incineration during the night. The emissions for the incinerator will not exceed the JAAQS for both SOx and NOx (Figure 3.13 & Figure 3.14) The fall out location for the pollutants (SOx and NOx) will be 0.16 km – 1.28 km from the source in a Westerly to SSW direction.

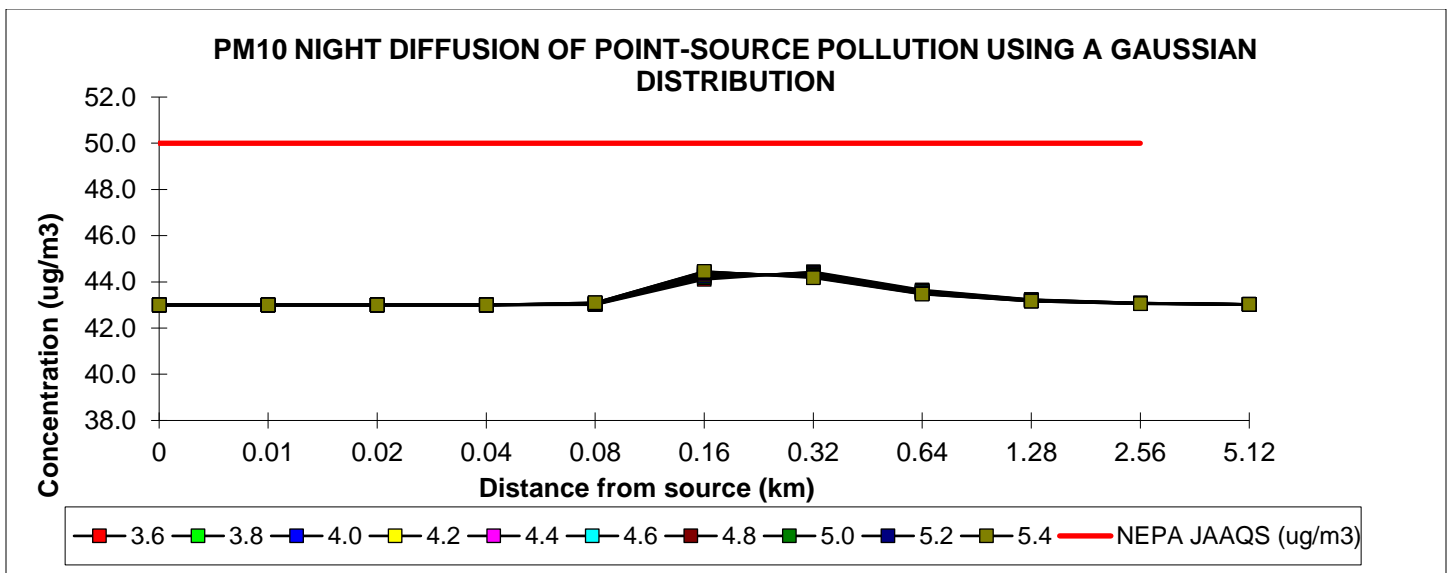


Figure 3.13 PM10 night diffusion of point-source pollution using a gaussian distribution

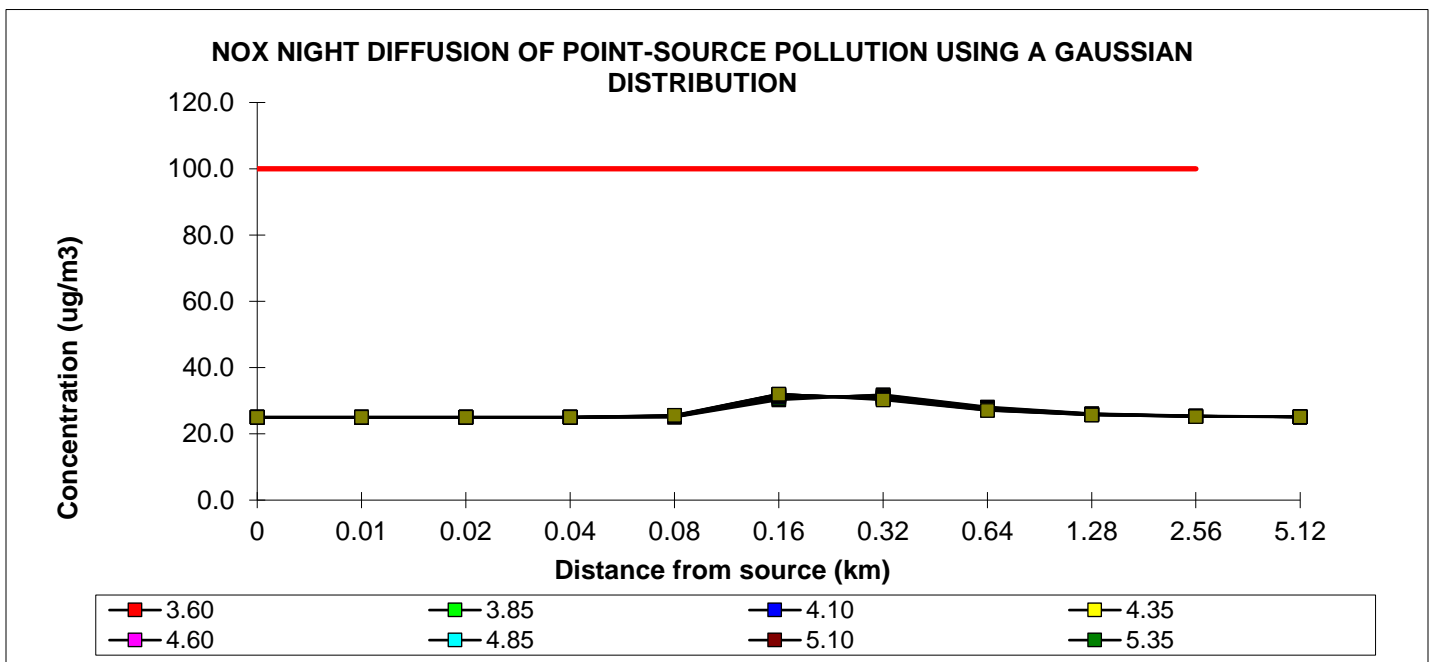
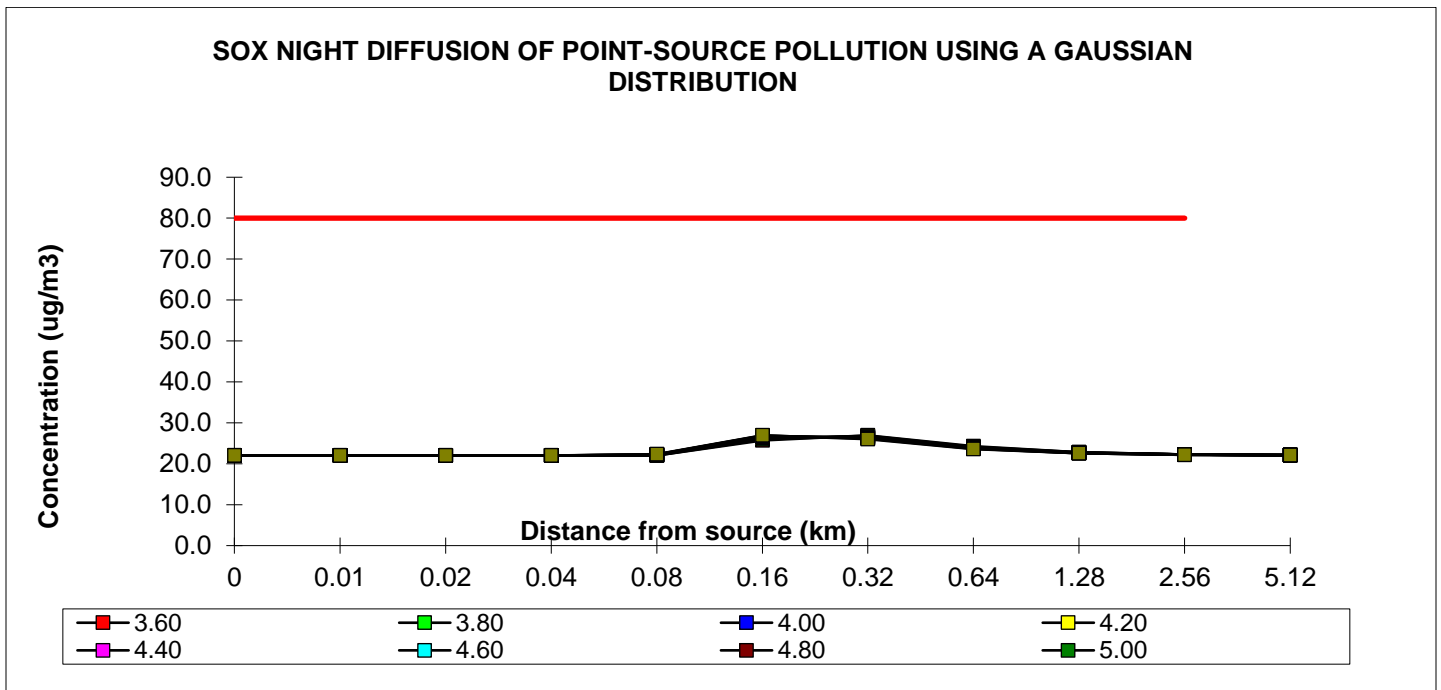


Figure 3.14 SOx night diffusion of point-source pollution using a gaussian distribution (top) NOx night diffusion of point-source pollution using a gaussian distribution (bottom)

4 Appendices

4.1 Lot 31 Title



JAMAICA

Certificate of Title under the Registration of Titles Act

REGISTER BOOK	Folio	753
	Volume	1518

S77 2136954
 D.P. No 14899
 Date Issued: 27th day of July, 2018
 Parent Title(s): Volume 1187 Folio 395
 Plan Annexed Yes

I. Registered Owner

CUMBERLAND PEN LAND HOLDINGS a company incorporated under the Laws of Jamaica at 53 Knutsford Boulevard, Kingston 5, Saint Andrew is now the proprietor of an estate in fee simple subject to the incumbrances notified hereunder.

II. Description of Property

Parish: ST. ANDREW
 Property Name: LOT D, PART OF CUMBERLAND PEN KNOWN AS FERRY PEN SAINT ANDREW NOW CALLED KINGSTON 876, COMMERCIAL PARK
 Lot No: 31

Together with 4 (Four) Common Properties on the Aforesaid Plan

TITLE REFERENCE	LOT NO	DP NO	SHARE	USE (DESCRIPTION)
VOLUME 1187 FOLIO 395	53	14899	1/52nd	Lot (Open Space)
VOLUME 1187 FOLIO 395	54	14899	1/52nd	Lot (Open Space)
VOLUME 1187 FOLIO 395	RESERVED ROAD SECTION 1	14899	1/52nd	Roadway (Reserved Road)
VOLUME 1187 FOLIO 395	RESERVED ROAD SECTION 2	14899	1/52nd	Roadway (Reserved Road)

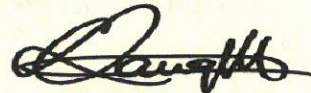
for Registrar of Titles



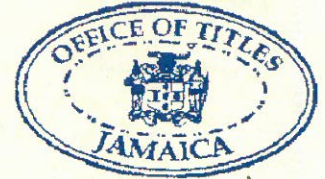
Incumbrances above referred to:

Miscellaneous No. 1138123 dated the 5th day of January, 2001 and registered on the 20th of February, 2001 whereby in consideration of the sum of Three Million Dollars the registered proprietor of the land comprised in this Certificate of Title (hereinafter called "the Grantor") hereby grants to JAMAICA PUBLIC SERVICE COMPANY LIMITED at 6 Knutsford Boulevard, Saint Andrew (hereinafter called "the Grantee") its successors and assigns in perpetuity the liberty and right now at all times hereafter of constructing, maintaining, repairing, inspecting, removing replacing and operating an electric transmission and or distribution line of towers and/or poles anchors and guys together with all necessary wires cables insulators and other apparatus necessary for the purpose of the transmission line and or distribution of electricity from any of the Company's

generating stations in through upon over or under the said land along the centre line of the path shown in red on the plan(s) hereunto annexed and the liberty and rights at all times hereafter of cutting down, trimming and removing any trees, growth, bushes, crops and vegetation which may at any time be namely growing nor extending over the strip of land lying within 5.73 metres (18.78 feet) of either side of the path shown on the said plan(s) and which may in the opinion of the Company interfere with or impede or be likely to interfere with or impede any of the matters or things herein mentioned or referred to, together with the free and uninterrupted right of entry way and passage for the Company its agents, workmen and servants at all times upon and over the said land either with or without apparatus, appliances, vehicles and animals for all or any of the purposes aforesaid including full liberty and right to do all such things as may be reasonable necessary to enable the Company to enjoy and exercise the liberty and right hereby granted to the Grantee causing as little damage as practicable to the said land in the exercise of the rights herein granted subject to the covenants further set out in the wayleave Agreement.



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The restrictive covenants set out hereunder shall run with the land above-described (hereinafter called "the said land") and shall bind as well the registered proprietor his personal representatives and transferees as the registered proprietor and shall, enure to the benefit of and be enforceable by the registered proprietor for time being of the lands or any portion thereof comprised in Certificate of Title

registered at Volume 1187 Folio 395.

1. No water used for domestic purposes in respect to the said lands or any water except storm water shall be permitted or allowed to flow from the said lands or any part thereof on the remaining portion of the said lands or road street or lane adjacent thereto but that all such water as aforesaid shall be got rid of by being run into an absorption pit or pits by evaporation or percolation of the said lands. 2. No building or permanent structure except for a guard house, garbage receptacle, and standby generator room shall be erected less than 6.1 metres from the property boundary along Tom Cringle Drive and the proposed reserved and private property roads. 3. No building or permanent structure shall be erected less than 12.2 m from the Duhaney or Fresh River. 4. There shall be no further subdivision of the said land save and except as approved by the KSAMC. 5. No sign or hoarding or other advertisement shall be erected on the said land except as otherwise permitted by the KSAMC. 6. All buildings and permanent structures to be erected on the said land shall be setback a minimum of 3.1m from any drain easement or drain reserve or as stipulated by the NWA or the KSAMC.



for Registrar of Titles



The land above described (hereinafter called "the said land") is subject to the conditions imposed by the Kingston & St. Andrew Corporation in resolution dated May 2, 2018.

1. Submission to and approval by the KSAC of layout plans indicating the form(s), type(s) of development, phasing and details of each and every type of building to be constructed. 2. The setback of 6.1 metres except for a guardhouse, garbage receptacle, and standby generator room shall be from the property boundary along Tom Cringle Drive and the proposed reserved and private property roads to the eave of any building respectively. 3. The proposed roads shall be held as private roads to be maintained by the registered proprietors. 4. A detailed drainage plan shall be submitted with detailed building plans for the said land illustrating the interception of surface drainage /storm water runoff and disposal on-site into dry wells/absorption pits or storage tanks for approval by the KSAMC. 5. Surface drainage/storm water runoff shall be effectively intercepted and disposed of by means conforming to the approved detailed surface drainage infrastructure plan and hydraulic report date stamped December 6, 2016. 6. There shall be no deviation from the approved detailed surface drainage infrastructure plan without consent of the Chief Executive Officer, National Works Agency. 7. Roof water from the buildings on the said land shall be collected in gutters along the eaves, drained to down pipes and disposed of into an absorption pits/dry well at the lowest areas within the site or to a water

storage tanks to the satisfaction of the KSAMC. 8. Storm water from impervious surfaces (not including roofs) shall be disposed of into an absorption pit/dry well at the lowest areas within the site or to a water storage tank to the satisfaction of the KSAMC. 9. The registered proprietors shall construct or cause to be constructed tanks of minimum volume of 2 days supply. The tanks shall be fully operational for the supply of potable water before the occupation of any of the lots

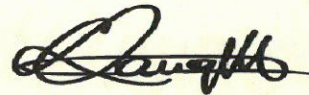


for Registrar of Titles



III. Memorandum of Transactions

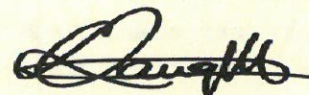
Mortgage No. 2004020 registered in duplicate on the 31st day of May, 2016 to PROVEN INVESTMENTS LIMITED at 20 Micoud Street, Castries, Saint Lucia to secure Eight Million Dollars United States Currency with interest. Subject to Caveat Nos. 36709 and 64297.



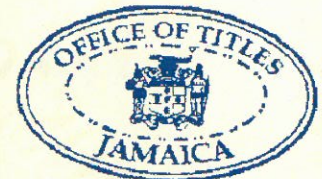
for Registrar of Titles




Transfer No. 2113515 registered on the 30th day of May, 2018 of Mortgage No. 2004020 to NATIONAL COMMERCIAL BANK JAMAICA LIMITED at "the Atrium" 32 Trafalgar Road, Saint Andrew. Subject to Caveat Nos. 36709 and 64297. Consideration money Eight Million Dollars United States Currency.



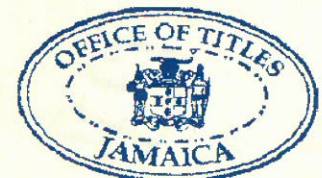
for Registrar of Titles



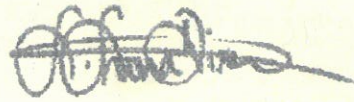
Mortgage No. 2113517 registered in duplicate on the 30th day of May, 2018 to NATIONAL COMMERCIAL BANK JAMAICA LIMITED at "The Atrium" 32 Trafalgar Road, Saint Andrew. Subject to Caveat Nos. 36709 and 64297 to secure the monies mentioned in the mortgage stamped to cover Two Hundred and Thirty Two Million Dollars with interest.



for Registrar of Titles



Discharge No. 2149996 entered the 2nd day of October, 2018 of Mortgage Nos. 2004020 and 2113517.



for Registrar of Titles



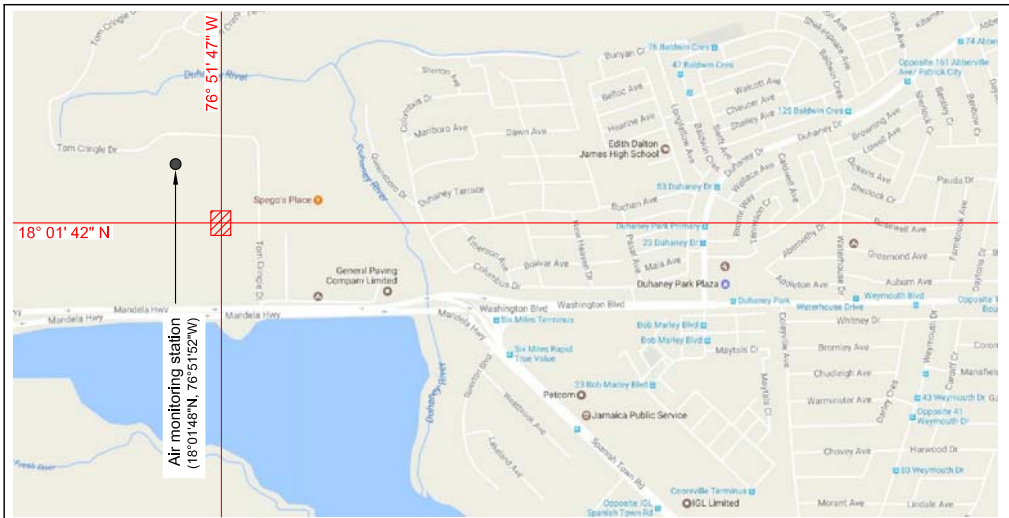
Transfer No 2149997 registered on the 2nd day of October, 2018 to CEAC OUTSOURCING COMPANY LIMITED at 20 Windsor Avenue, Kingston 5, Saint Andrew. Subject to Caveat Nos. 36709 and 64297 Consideration money Three Hundred and Sixty Five Thousand Dollars United States Currency.



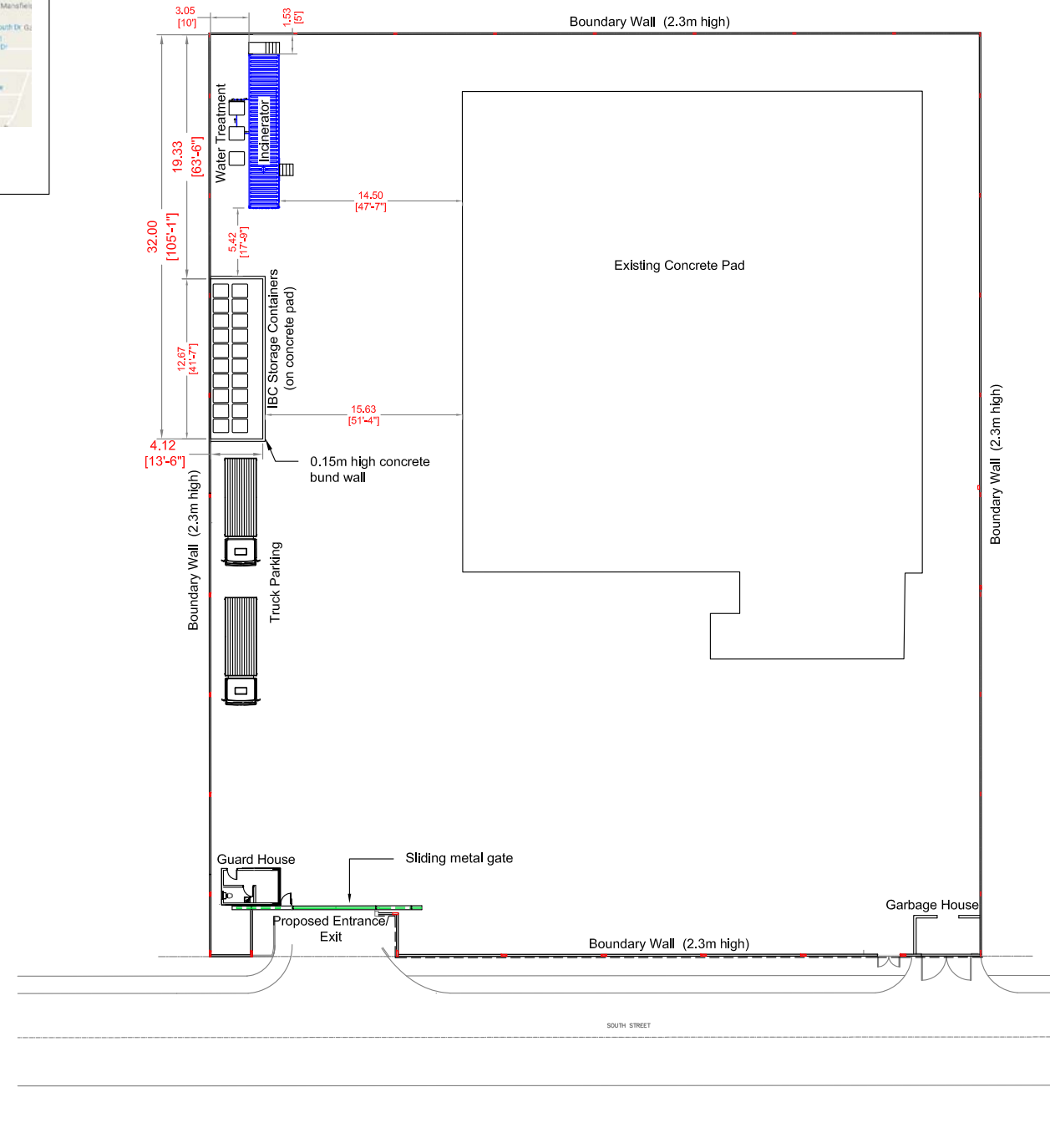
for Registrar of Titles



4.2 Site Plan



Location Map
Scale = 1:25,000



Typical Site Layout
Scale = 1:500



Developers: **Business Name**
Address
Parish
Phone: #
Fax: #
e-mail:

Civil Engineers: **CEAC Solutions Co. Ltd**
20 Windsor Avenue
Kingston 5
Phone: (876)-946-2210
Fax: (876)-978-8760
e-mail: admin@ceacsolutions.com

Consultant: **Business Name**
Address
Parish
Phone: #
Fax: #
e-mail:

Notes:
1. Notes

Drawing Status	
<input type="checkbox"/>	For submission
<input type="checkbox"/>	For tender
<input type="checkbox"/>	For construction
<input type="checkbox"/>	For review

Revisions		
No.	Description	Date

Client: CEAC Outsourcing Co. Ltd.

Project Name: HazPro Incinerator

Sheet Name: Typical Site Layout

Project number: CEAC-2019-01
Date: 2019-02-08
Drawn by: MH
Designed by: CB & HC
Checked by: CB

CEAC-2019-01-C.001

Scale: As shown

4.3 MOH No Objection Letter



MINISTRY OF HEALTH

□ RKA BUILDING, 10-16 GRENADA WAY □ 45-47 BARBADOS AVENUE ☒ 24-26 GRENADA CRESCENT □ 10^A CHELSEA AVENUE
KINGSTON 5, JAMAICA, W.I.
Tel: (876) 633-7400/7433/7771/8172
Website: www.moh.gov.jm

ANY REPLY OR SUBSEQUENT REFERENCE SHOULD BE
ADDRESSED TO THE PERMANENT SECRETARY AND THE FOLLOWING
REFERENCE QUOTED:

EHU NO: 01/7/19-9
REFNO: 2019-10017-EP00039

National Environment & Planning Agency
10-11 Caledonia Avenue
Kingston 5

March 18, 2019

RE: Environmental Permit Application to relocate Mobile Incinerator to Ferry, St. Andrew

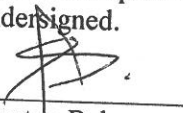
The Environmental Health Unit (EHU) reviewed documents/designs in a NEPA submission dated **February 21, 2019 and received March 4, 2019**, supporting the abovementioned development.

The EHU **Objects** to the burning of the following waste stream as indicated in the document submitted.

- I. Radioactive waste
- II. Heavy metals to include mercury
- III. Batteries

No objection is made to the relocation of the facility as proposed.

If you have questions or require more information please contact Marsha-Ann Palmer or the undersigned.



Everton Baker
DIRECTOR Environmental Health Unit

- C. Medical Officer (Health)
KSA Health Department
Attention: Chief Public Health Inspector

4.4 Letter to NEPA Regarding Matters for Clarity

April 10, 2019

Application Management Division
Manager
Attn. Mrs. Aisha Bedasse-Jureidini
National Environment & Planning Agency
10 & 11 Caledonia Avenue
Kingston 5



Dear Mrs. Bedasse-Jureidini,

RE: ENVIRONMENTAL PERMIT APPLICATION FOR MONILE INCINERATOR AT FERRY PEN, ST. ANDREW

We are in receipt of your letter dated April 8, 2019 for the captioned. The comments raised in NEPA letter are clarified in Table 1. In the appendix are images of the various storage containers, ship generated waste and medical waste handling.


Table 1 CEAC's Responses to NEPA's Questions/Comments

Item No.	NEPA Comments	CEAC's response
1	Further details on what impacts, if any, the operations of the facility will have on the construction operations and workers at the site and how this will be mitigated	<p>We have assumed this question is referring to construction workers in the approved Ferry/Cumberland sub-division (now being constructed) and workers at the existing commercial enterprise within the sub-division.</p> <p>Impacts and Mitigation measures:</p> <ol style="list-style-type: none">1. <u>Air Quality</u>: Plume dispersion modelling indicate that emissions for the incinerator will not exceed the JAAQS for PM10, SOx, NOx and CO. Concentrations between zero and 1000 meters of the stack, in worst case atmospheric conditions are between 25% to 5 times better than the JAAQS. As such, the construction operations and workers will not be affected.2. <u>Noise</u>: The international standards for occupational noise ranges from 85 – 90 dBA for an 8-hour work day. For the incinerator at a distance of 1m from the source the noise levels are 65 dBA and 70 dBA for the primary and secondary burner respectively. Incinerator operators will not be required to be in the incinerator 40' container continuously throughout the day. The operators will be stationed at the Site office and inspect the incinerator at 15-minute intervals to record temperature and stack emission data. Whilst in the incinerator container, operators will be equipped with ear plugs with a Noise Reduction Rating of 32 dB which would reduce the noise levels to 52.5dBA and 57.5 dBA for the primary and secondary burners respectively.

Item No.	NEPA Comments	CEAC's response
		<ol style="list-style-type: none"> 3. <u>Fugitive Emissions</u>: the possible source of fugitive emissions will be the particle dispersion from the ash storage. The ash will be stored in covered containers to prevent the dust particles from escaping. 4. <u>Odour</u>: the main source of odours at the facility will be from the food waste and medical waste. The food waste will be stored in a refrigerated container to contain the odour and as a means of vector control. The medical waste will be given priority of incineration at the facility to reduce the storage time of the waste to ~ 1 day or less.
2	<p>Justification for a temporary relocation versus relocating to a permanent site, considering the time frame provided is from four (4) to eight months (8).</p>	<p>COCL has been in discussions with the agency to develop a permanent base at Sheckles, Clarendon. However, in the interim COCL is seeking to relocate the incinerator to Lot 31 Ferry Pen for a period of four (4) – eight (8) months. The removal to Sheckles is dependent on regulatory approvals and conveyancing timelines that are not clear at this time.</p> <p>COCL currently owns Lot 31 Ferry Pen (Vol/Fol: 1518/753), which is scheduled to be developed to a Business Process Outsourcing (BPO) facility. The building has not yet been constructed and in the interim COCL is proposing to utilize a portion of the lot for the storage and operation of the incinerator, until the building is completed and ready for tenancy.</p>
3	<p>The site proposed may present similar concerns as that which was raised for the following sites, Central Village, St. Catherine, Hayes, Clarendon and Hamilton Drive, Palmers Cross, Clarendon, which was previously considered by the Agency through the DAC (please refer to response dated 11December 2018; attached for ease of reference.)</p>	<p>The issues cited are not relevant to the proposed Ferry incinerator site. The letter dated December 11, 2018 highlighted issues such as:</p> <ol style="list-style-type: none"> 1. Close proximity to residences, schools and public institutions (estimated distance of less than 50m) 2. The area being zoned for residential and government use. <p>These issues are not applicable for the following reasons:</p> <ol style="list-style-type: none"> 1. The distance to the nearest residents exceeds the minimum distance of 50 m: <ol style="list-style-type: none"> a. North East: 290 metres to Tankweld and CHEC facilities b. East: 650 metres to New Haven Community c. South East: 173 meters to Nestle Facility d. South West: 690 meters to Ferry Community 2. A wind rose plot for Ferry (Figure 3.6 in the project brief) shows that the wind will be blowing in a North Westerly

Item No.	NEPA Comments	CEAC's response
		<p>and Westerly direction away from the residences >99% of the time.</p> <p>3. The land is zoned for light industry/commercial use according to the TCPA KSA Provisional Development (2017)¹</p>
4	<p>Page 11 of the Project Brief states the proposed container for the wastewater from the scrubber is a 250US gallon IBC water container. These containers can only hold a maximum of 950L (based on the use of US gallon conversion to litres), therefore a difference of 490L would exist. Please clarify this discrepancy. Additionally, it states that the scrubber wash water will be transferred to a septic tank for storage prior to being emptied via a cesspool emptier. Please clarify if this is a holding tank rather than septic tank.</p>	<p>This was an error the statement should read as follows: “The venturi scrubber utilizes 1 L/min, therefore for incinerating for 24 hours per day the total water consumed is 1440 L/day (1.44 m³/day)”</p> <p>The wastewater generated by the scrubber is approximately 60% of the water consumed, that is, 864 L/day. 40% of the water consumed is lost to evaporation due to the high temperatures in the scrubber. Therefore, the two 250-gallon IBC containers provide adequate storage for the wastewater generated. Typically, the tanks have to be topped up with fresh water (from NWC) daily to meet the consumption needs of the scrubber.</p>
5	<p>Kindly clarify if there will no longer be any incineration of sludge/obsolete agrochemicals. The Project Brief speaks to ship generated waste (food) and medical waste, however the Agency would like to confirm whether all of the waste streams previously approved for incineration at New Yarmouth are still being considered for inclusion at the Ferry Pen location.</p>	<p>Sludge/obsolete chemicals will still be incinerated. Table 3.1 indicates an annual capacity of 50 tonnes/year for this waste stream.</p>
6	<p>The Agency notes that applications are also in house for the proposed Port Reception Facility at Granville, St. James, along with the associated incinerator proposed at that location. In this context, the Agency would like to clarify the potential source(s) of the ship generated waste (food) proposed to be incinerated at Ferry Pen (such as which ports or entities have been/ will be approached).</p>	<p>Currently CEAC Outsourcing Co. Ltd. (COCL) has been approached by one ship, and two cruise ships in 2018, for the incineration of food waste:</p> <ol style="list-style-type: none"> 1. Golar Freeze to incinerate 2500 kg of food waste from the ship. This food waste will be collected from the Monymusk Gun, Rod and Tiller Club, Clarendon. <p>It is uncertain the how many other requests will be received. However, COCL will notify the Maritime Authority of Jamaica (MAJ) of NEPA's EP approval. MAJ will then add COCL to their list of approved waste service providers.</p>

¹ http://nepa.gov.jm/new/legal_matters/laws/Planning_Laws/TCPA_KSA_Provisional_Development_Order_2017.pdf (page 453)

Item No.	NEPA Comments	CEAC's response
7	The proposed storage of the ship generated waste in refrigerated containers was also noted; however, the size of said containers was not disclosed. The number of hazardous waste containers was also not disclosed. Additionally, the proposed size of the septic tanks for the facility was not included. Please provide information for same.	<p>Ship Generated Waste: 6'x12'x8' ft cooler/refrigerated truck (see attached example of freezer trailer)</p>  <p>Medical & Hazardous Waste: 20 250-gallon IBC containers Septic Tank: 600 gallons (a premanufactured plastic septic tank from roto plastics)</p>
8	Section 1.2 Motivation and Previous Operations (Table 1.1) refers to the total quantities of waste treated, but does not specify a period of time. Please indicate the specific period for which this information refers.	August 20, 2018 – January 10, 2019 (~5 months)
9	Section 3.1.1 Waste streams require additional details for the transport procedures for various waste collected.	<p>The transportation procedures for the Ferry Location will be the same as the transportation procedures listed in the Work Plan for the New Yarmouth Estate location. Namely:</p> <ol style="list-style-type: none"> 1. Pursuant to the Environmental Permit Specific Conditions – Transportation, all vehicles transporting waste will have hazard labelling signs clearly displayed on the vehicles. The Transport & Emergency Response (TERM) Card will be retained in the vehicle at all times during the transportation of hazardous waste. CEAC will ensure that there are no spills or leaks to the environment during the transfer of

Item No.	NEPA Comments	CEAC's response
		<p>hazardous waste into the vehicle and while being transported.</p> <ol style="list-style-type: none"> 2. A transportation log will be kept for each movement of the waste to or from the mobile incinerator facility. At each instance of transportation, a manifest will be issued to the client and a copy will be retained by CEAC for record keeping purposes. The manifest will contain the generator/client's information, the type, volume and category of hazardous waste as well as the CEAC personnel responsible for the transportation. The manifest will be dated and signed by a representative of the generator and the CEAC personnel responsible for the transportation. <p>More specifically for the various waste streams:</p> <ol style="list-style-type: none"> 1. Medical Waste: the COCL box truck will drive to the location where the waste is stored. At the medical facility MW is stored in red bags and sharps containers. These containers will be placed in the COCL box truck which has been modified to have impermeable walls and floors. The waste will then be driven to the Ferry location. 2. Ship generated waste: the ships will transport the food waste to the port in sealed containers. COCL will be at the port awaiting the ship. COCL will transfer the food waste to the box truck, in which the waste will be stored in modified IBC containers. The waste will then be driven to the Ferry location. 3. Hazardous waste/Obsolete Chemicals: the COCL box truck will drive to the location where the waste is stored. Wastes containing free liquids will first be stored in sealed containers and then will be stored in modified IBC containers in the box truck. Solid wastes should already be stored in sealed containers (from the waste generator). The sealed containers will be stacked in the box truck. The waste will then be driven to the Ferry location.
10	<p>Section 3.1.4 Storage of Hazardous Waste/Section 3.2.1.1 Safe Handling of Medical Waste: The Storage and Handling procedures of hazardous waste taken from the sources to the facility for which incineration is needed. The method of sealing of the modified containers also needs to be Outlined.</p>	<p>The containers are not sealed. They are latched closed and covered with a tarpaulin to prevent exposure to rainfall.</p>

Sincerely,

CEAC SOLUTIONS COMPANY LTD.



Lauren Campbell

Operations & Chemical Engineer

Attached: Images of Collection & Transportation of various waste streams

Modified IBC Containers for Transportation



Modified IBC Containers for Storage



Ship Generated Waste handling



Figure 1 Food waste from ship at port



Figure 2 Loading of Box truck with food waste (left) refrigerated truck (right)

Medical Waste Handling



Figure 4 Medical Waste at waste Generating Facility



Figure 3 Loading of Box truck with medical waste (left) Unloading of truck at Incinerator Facility (right)

PPE



Figure 5 Incinerator operator wearing heat resistant PPE (left) Incinerator operator wearing chemical resistant PPE (right)



Figure 6 Respirator supplied to incinerator operators supplied with both particulate and multi-gas cartridges



Polar King[®]
INTERNATIONAL, INC.

SEAMLESS FIBERGLASS
COOLER & FREEZER
TRAILERS





Polar King[®]
INTERNATIONAL, INC.



**Shown with optional mounted spare tire.*

"Our entire experience was a stellar example of customer service and satisfaction being a company's number one priority. We would certainly use their products in the future."

>> Zeb Mayhew Jr., LCTP-Oak Alley Plantation Restaurant & Inn, Vacherie, LA

SEAMLESS FIBERGLASS COOLER & FREEZER TRAILERS

>> Delivering solutions for your refrigerated needs.

Founded in 1982, Polar King International, Inc. is known throughout numerous industry segments as the premier manufacturer of mobile and stationary walk-in refrigeration units. Using our patented fiberglass design and the highest quality materials and craftsmanship, anything with the Polar King logo represents the best in refrigerated storage.

We take great pride in being a family owned company, offering exceptional products and customer service. The size of our company continues to grow, but our commitment to providing an outstanding customer experience remains unchanged. In fact, we still answer every phone call with a real person and never use automated e-mail responses. Our constant mission to provide customers with reliable long lasting products is the cornerstone of our commitment to ensuring a successful partnership to provide solutions to your refrigeration needs.



**Shown with optional chrome wheels.*

Polar King refrigerated trailers are the practical solution for operators requiring refrigeration on the go, or at various locations. Our units are designed for food storage in any location, allowing you to take your business virtually anywhere. If your business requires off-site refrigeration, is looking to increase bulk food purchases, or just needs to ensure a back-up plan is in place should an existing walk-in fail, then a Polar King unit is right for you!

"Polar King units are top of the line. We now have two of them; both a cooler and a freezer. Our long range plans call for one more and we'll be in touch to place another order."

>> Bill New, Firebird Raceway Inc., Eagle, ID



**Shown with optional stainless steel door kick plate.*

SEAMLESS FIBERGLASS COOLER & FREEZER TRAILERS

FIBERGLASS ADVANTAGE

Polar King cooler and freezer trailers incorporate Polyisocyanurate insulation completely encased in fiberglass, both inside and out. This method provides superior structural strength since it forms a one-piece structure. There are no seams on a Polar King unit; therefore the structure remains completely intact so air and moisture cannot deteriorate the insulation.



SUN A seamless exterior assures economical operation even in the most intense heat. Tested above 175°F, Polar King's fiberglass design is the perfect fit for warm weather climates.



RAIN The inherent strength of fiberglass allows a Polar King unit to withstand blowing debris and abuse associated with heavy thunderstorms.



SALT Saltwater can be a real challenge for operations near the coast, especially when dealing with a metal walk-in. Because fiberglass does not rust, dent or corrode, this problem is eliminated.



SNOW Even heavy snow is no match for a Polar King. The roof can be rated to withstand a snow load of up to 100 lbs. per sq./ft. Because of Polar King's construction, there is no need for steel framing.



>> SEAMLESS INSIDE AND OUT

Both over the road and on-site Polar King units are built to last. Our unique seamless, one-piece, fiberglass construction will not rust, scratch, dent or corrode. To top it off, every Polar King trailer comes with a 1-year complete structural warranty ensuring you superior durability even in the worst of weather conditions.

It's common to see Polar King refrigerated trailers at festivals, sporting events and other short term outings that don't traditionally offer refrigerated space for vendors and caterers. Also great during times of breakdown or repair, Polar King trailers are excellent insurance against the unexpected. Designed primarily for off-site refrigeration where an electrical connection can easily be obtained. Or for power on the go, Polar King offers gasoline and diesel generators for maximum flexibility.



**Shown with optional generator and fuel storage tank.*

"You guys really do it right, customer service is obviously priority one at Polar King."

>> Kevin Rudolph, Rudolph Brothers & Co., Canal Winchester, OH

6' x 8'
Transportable
Cooler or Freezer

6' x 10'
Transportable
Cooler or Freezer

SEAMLESS FIBERGLASS COOLER & FREEZER TRAILERS

STANDARD SIZES & FEATURES



- >> Convenient and Portable
- >> Durable Fiberglass Construction
- >> Efficient Refrigeration System
- >> Simple 2" Ball Hitch Connection
- >> 3500# Torsion Axle



STANDARD SIZES

Available in standard 6' x 8' single axle, 6' x 10' dual axle, 6' x 12' dual axle and many custom sizes, these trailers can be configured as coolers and/or freezers. Some of which operate on a 115V electrical connection.

6' x 12'
Transportable
Cooler or Freezer

6' x 12'
Transportable
Combination
Cooler | *Freezer*

For applications requiring higher mileage transit, our **Glacier King -20** vans provide the ultimate in frozen delivery. Built as an alternative to traditional refrigerated straight trucks, these vans provide a cost effective and efficient design, achieving up to 18 mpg/hwy. With operating temperatures down to -20°F , the **Glacier King -20** is the perfect answer to LTL delivery and hotshot applications.



GLACIER KING -20

- >> Optional electric standby
- >> 144" and 170" wheelbase
- >> Temp range from -20°F to 32°F
- >> Optional hot gas heat for temps up to 90°F
- >> No CDL license required for standard models
- >> Fuel efficient Mercedes diesel engine
- >> Over 2,000 lb. payload
- >> Financing available



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OPTIONS / ACCESSORIES

All Polar King trailers are built from the ground up, allowing you to add custom options of most any type to your new refrigerated trailer. From gas and diesel generators to galvanized frames, we have the capabilities to design the perfect trailer for your application.

Choose from hundreds of accessories, such as:

- >> Double Doors
- >> Retractable Step
- >> Loading Ramp
- >> Beverage Tappers
- >> Custom Finishes
- >> Gas/Diesel Generators



"In order to expand our catering sales, we realized it would make sense to buy our own trailer and we haven't looked back since. I have no doubt that investing in our trailer has been beneficial to our catering business and I would highly recommend Polar King as a reputable company that builds a great refrigerated trailer."

>> Dennis Langhoff / Multi-Unit Subway Franchisee, Lonsdale, MN





4424 New Haven Avenue, Fort Wayne, IN 46803

800-752-7178 www.polarking.com



SEAMLESS FIBERGLASS
COOLER & FREEZER TRAILERS