

# **SENTUO OIL REFINERY LIMITED**

## **ENVIRONMENTAL IMPACT ASSESSMENT**

### **PROPOSED OIL REFINERY**

**AT TEMA, GREATER ACCRA REGION, GHANA**

## ***APPENDICES***



***ENVIRONMENTAL PARTNERSHIP LIMITED***  
*P. O. Box KN 41920955*  
*Kaneshie, Accra*

*June 2020*

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Reg No. CS135322019



TIN : C002735055X

## Certificate of Incorporation

I hereby certify that

**SENTUO OIL REFINERY LIMITED**

is this day incorporated under the Companies Act, 1963 (Act 179) and that the liability of its members is limited.

Given under my hand and official seal at Accra, this 17<sup>th</sup> day of June 2019



For: Registrar of Companies

Appendix 1-1.2 Certificate to Commence Business

Reg No. CS135322019  TIN : C002735055X  
REPUBLIC OF GHANA

The Companies Act, 1963, Act 179  
**Certificate To Commence Business**

**I hereby certify that**

**SENTUO OIL REFINERY LIMITED**

having complied with the provisions of Sections 27 and 28 of the Companies Act, 1963, Act 179 is entitled to commence business with effect from **17<sup>th</sup> day of June 2019**

Given under my hand and official seal at Accra, this 17<sup>th</sup> day of June 2019

  
For: Registrar of Companies

Appendix 1-1.3 Correspondence: Acquisition of Industrial Plot No. IND/HI/21/5

SENTUO OIL REFINERY CO. LTD

TEMA.

THE MANAGING DIRECTOR

TDC DEVELOPMENT COM. LTD

P.O. BOX CO 46,

TEMA.

Dear Madam,

ACCEPTANCE OF OFFER ON INDUSTRIAL PLOT NO. IND/HI/21/5, INDUSTRIAL. 7TEMA

This is to acknowledge receipt of your letter offering me above-mentioned Plot. I wish to inform you of my acceptance of the terms and conditions stated therein.

The Land License Fee has been fully paid waiting for the necessary documents.

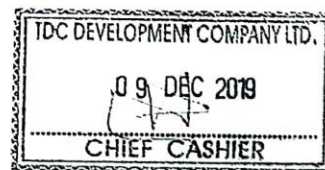
Counting on your usual co-operation

Thank you.

Yours faithfully,

*[Handwritten Signature]*  
for SENTUO OIL REFINERY CO. LTD

0244370060



# TDC DEVELOPMENT COMPANY LIMITED



P. O. Box CO 46, Tema - Ghana  
Tel: 233 - 302-202731 - 4  
Fax: 233 -303 -202737 233-303 - 207162  
E-mail: tdc@tdc.org.gh

Our Ref.....IND/HI/21/5.....

Your Ref:.....

Date: 10th Dec, 2019

THE MANAGING DIRECTOR  
SENTUO OIL REFINERY  
TEMA

Dear Sir/Madam,

RIGHT OF ENTRY LETTER  
INDUSTRIAL PLOT NO. IND/HI/21/5 - TEMA  
ACREAGE: 95.31 ACRES (38.59 HA)

We formally grant you access to the above-mentioned site offered you with effect from **16<sup>th</sup> December, 2019**.

This is in respect of your acceptance of the terms and conditions of the offer and the payment of the first year's Ground Rent.

Any enquiry in respect of the lease may be directed to the **Estates Officer (Lands)** at the Estates Department.

Yours faithfully,

  
**KWASI DARKO ASARE**  
**(HEAD OF ESTATES)**  
**for: MANAGING DIRECTOR**

cc: Managing Director (TDC)  
" Revenue Accountant "



# TDC DEVELOPMENT COMPANY LIMITED



P. O. Box CO 46, Tema - Ghana  
Tel: 233 - 302-202731 - 4  
Fax: 233 -303 -202737 233-303 - 207162  
E-mail: tdc@tdc.org.gh

Our Ref..... **IND/HI/21/5** .....

Your Ref:.....

Date: 10-12-2019

Dear Sir/Madam,

## OFFER FOR INDUSTRIAL PLOT NO. IND/HI/21/5 - TEMA

It is proposed to lease to you the above mentioned plot measuring approximately 95.31 Acres or (38.59 HA) on the following basis:

- i. **TERM:** 60 years commencing from date right of entry has been granted.
- ii. **GROUND RENT:** GH¢228,744.00 per annum payable yearly in advance prior to the date right of entry is granted.
- iii. **USE:** The land shall be used for **Industrial Purposes only.**
- iv. **BUILDING PERIOD:** The lessee shall be expected to commence building operations within 6 months of the site being handed over subject to a reasonable extension for legitimate cause of delay and to have the plot fully developed within 2 years from the date right of entry has been granted.
- v. **BUILDING PLANS:** Proposals for the development of the plot and site plans must be submitted to the Company for approval and a Building Permit obtained prior to commencement of any building operations.
- vi. **OTHER COVENANTS AND CONDITIONS:**
  - (a) The lessee shall be responsible for all outgoing including Rates and taxes.
  - (b) The lessee shall pay all legal and other expenses in connection with the preparation of the lease.
  - (c) The lessee shall not be permitted to sublet or transfer the whole or Part of the plot of land without consent of the Company.
  - (d) The lease shall contain all such other covenants that are normally included in lease of Lands in the Tema Acquisition Area.

2. Notwithstanding any provisions contained herein, your tenancy shall be subject to any new policy, rules and bye-laws that may be adopted and or passed by the TDC Development Company Limited and or the Government in so far as it affects or they affect the TDC Development Company Limited.
3. Your written acceptance of this offer must reach the Company within one calendar month from the date hereof to enable us grant you access to the site.
4. As soon as we are satisfied that there is an uninterrupted and substantial physical Development of the plot, our Legal Department will be advised to commence action on the preparation of the lease.
5. The Site Plan of the area allocated is attached.

Yours faithfully,



**ALICE ABENA OFORI - ATTA (MS.)  
(MANAGING DIRECTOR)**

**THE MANAGING DIRECTOR  
SENTUO OIL REFINERY  
TEMA**

cc: Managing Director (TDC)  
" Revenue Accountant "



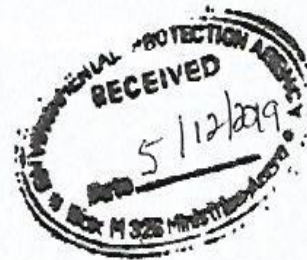
**Appendix 1-1.4 Registration of Project: EPA Form EA 2**



Plot # ND/A/66/11, Cemetery  
Junction Kpone, Tema - Ghana  
P.O. Box CT 1470, Cantonments,  
Accra-Ghana  
+233 24 580 5835  
+233 54 550 4092  
info@sentuooilrefinery.com  
www.sentuooilrefinery.com

4<sup>th</sup> December 2019

The Chief Executive Officer  
Environmental Protection Authority  
Head office  
Ministries  
Accra



Dear Sir,

**ENVIRONMENTAL PROTECTION AUTHORITY PERMIT**

I write on behalf of Sentuo Oil Refinery Limited to submit Form EA2 to kick-start our proposal to obtain Environmental Protection Authority permit for our proposed plan to construct a petroleum refinery at Tema Industrial Area.

Accept my esteemed regards as we anticipate your favorable response.

Thank you.

Yours faithfully,  
For and on behalf of  
Sentuo Oil Refinery Limited.

A handwritten signature in black ink, appearing to read "Francis Andoh".

Francis Andoh  
Lead Consultant

Environmental Impact Assessment  
Registration Form

**PROPOSED:** PETROLEUM REFINERY

Address for correspondence SENTRO OIL REFINERY  
PLOT # ND/A/66/11, CEMETERY  
JUNCTION, KPONE, TEMA -

Contact Person FRANCIS ANDOH Position LEAD CONSULTANT

Phone No. 0244510340 Fax No. —  
fandoh@sentrooilrefinery.com

1. Proposed Undertaking/Development:

CONSTRUCTION OF PETROLEUM REFINERY  
FACILITY. INTEND TO PRODUCE ABOUT  
1.5 MILLION TONNES OF PETROLEUM  
PRODUCTS PER YEAR.

Sector: PETROLEUM/ENERGY SECTOR.

Shareholders: \_\_\_\_\_

2. Proposed Site: TEMA, NSAR VALCO.

Town/Village: TEMA INDUSTRIAL AREA.

(Attach Location Map)

District: TEMA.

Region: GREATER-ACCRA REGION.

**Appendix 1-1.5 Letter to Stakeholders**

**ENVIRONMENTAL PARTNERSHIP LIMITED**



Registered Office/Courier Address  
H/No 113, Sowoutoum  
Mob: 0267548553/0244530955  
Our Ref: EPL/20/SENTUO/03  
Email: [snobiya@gmail.com](mailto:snobiya@gmail.com)

P. O. Box KN 4192  
Kaneshie – Accra  
31 January 2020

**TO ALL STAKEHOLDERS**

Dear Sir/Madam,

**ENVIRONMENTAL IMPACT ASSESSMENT OF PROPOSED OIL REFINERY  
AT TEMA IN THE GREATER ACCRA REGION**

SENTUO Oil Refinery Limited (SORL) intends to construct and operate an oil refinery on Industrial Plot No. IND/HI/21/5 at Tema in the Greater Accra Region. The location of the proposed project site, which is 38.59 hectares (95.31 acres), is indicated in the attached map.

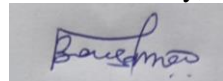
According to the relevant existing environmental and socio-economic regulations as contained in Ghana's Environmental Assessment Regulations, L.I. 1652 (1999), the magnitude of this project requires an Environmental Impact Assessment (EIA) study to show compliance with the relevant laws and regulations.

SORL has therefore commissioned Environmental Partnership Ltd. (EPL) to conduct an EIA study on the construction and operation of the oil refinery. As part of the assessment process, it is mandatory that beneficiaries and stakeholders be consulted to seek their views on their concerns and appreciation of the project.

EPL would therefore be pleased to have your written comments on the proposed activities to be carried out by SORL.

We look forward to hearing from you soon.

Yours faithfully,



S.B. Nobiya  
(DIRECTOR)

## Appendix1-1.6

## Comments from EPA on Scoping Report

Tel: (0302) 664697 / 664698 / 662465

667524 / 0289673960 / 1 / 2

Fax: 233 (0302) 662690

Email: [info@epa.gov.gh](mailto:info@epa.gov.gh)

Ghana Post (GPS): GA-107-1998



**Environmental Protection Agency**

P. O. Box MB 326

Ministries Post Office

Accra, Ghana

Website: <http://www.epa.gov.gh>

Our Ref: CE: 7316/05

21<sup>st</sup> May 2020

Your Ref: EP/EA/01/19

ENVIRONMENTAL PARTNERSHIP  
KANESHIE -ACCRA  
GHANA

Dear Sir,

**RE: SUBMISSION OF A SCOPING REPORT FOR THE PROPOSED OIL  
REFINERY AT TEMA, GREATER ACCRA REGION**

We write to acknowledge receipt of your Scoping Report and a cover letter dated 16<sup>th</sup> April 2020 and referenced EP/EA/01/19 on the above subject.

As per the requirement of the Environmental Assessment Regulations (LI 1652), the Agency constituted a team to conduct screening of the proposed site prior to commencement of the review of the scoping report. The findings of the screening are as follows:

1. the proposed site is a wetland area,
2. there is a stream traversing the site,
3. there is a main sewer line traversing the site
4. the site is traversed by GRIDCO pylons, carrying high voltage power

In accordance with the requirement of the Environmental Assessment Regulations, 1999 (LI 1652), the Agency reviewed the Scoping Report and submit the following observations for consideration:

1. the Planning Committee of Tema Metropolitan Assembly (consisting of Planning, Environment and Health, Engineering and Architecture, and EPA, Greater Accra East) who had earlier on visited the site on Wednesday 26 February 2020 observed and recommended the following:
  - a. the area is environmentally sensitive;
  - b. the area falls under the jurisdiction of Tema Metropolitan Assembly;
  - c. the area forms part of the core catchment of the Chemu Lagoon;
  - d. the area is a wetland as indicated by the presence of aquatic vegetation (*Typha sp.*) and mangrove trees (*Avecinia sp.*);
  - e. the area acts like a buffer such that it gets flooded during periods of heavy rains;
  - f. A sewer line runs through the area and may be interfered by construction activities;
  - g. the proposed oil refinery would add to an already congested situation;
  - h. The project area is too close to Tema New Town;
2. Summary of key Environmental Concerns raised by key stakeholders during the scoping process are as follows:
  - a. possible flooding of project area and maintenance of buffer zone



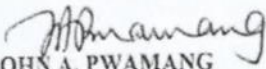
- b. potential negative impacts on the adjacent Tema New Town;
  - c. increased congestion in the proposed project area;
  - d. consideration for another location for the proposed refinery;
  - e. potential interference with pipelines and other facilities in the proposed project area; and
  - f. proposed project area is a wetland;
3. Consideration of project alternative sites was limited to only two areas, (Tema Heavy Industrial Area and Petroleum Hub in Western Region) whilst other nearby areas were not considered at all.
4. Consultation with Adjoining Community (Tema New Town)  
We observed that the adjoining community (Tema New Town) who are likely to be impacted negatively has not been consulted.

In view of the above we recommend that you take the above issues into account in the conduct of the Environmental Impact Assessment (EIA) Study and preparation of the Environmental Impact Statement (EIS).

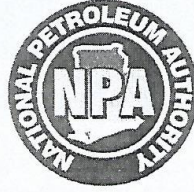
You are therefore requested to submit ten (10) copies of the draft EIS for review.

Should you require any further clarification or guidance, please do not hesitate to contact the Agency.

Yours faithfully,

  
JOHN A. PWAMANG  
AG. EXECUTIVE DIRECTOR

Cc: The Acting Regional Director  
Environmental Protection Agency  
Accra East



**PUBLIC NOTICE – NPA. N. 017**

**REQUIREMENTS FOR A PERMIT TO CONSTRUCT A PETROLEUM  
REFINERY/PETROCHEMICAL PLANT IN GHANA**

A permit shall be granted in the following sequential stages culminating in the grant of a license to operate the plant.

- a. Licence to establish a Refinery
- b. Permit to construct a Refinery, and
- c. Licence to operate a Refinery.

**LICENCE TO ESTABLISH A REFINERY**

The application for a licence to establish a Refinery shall be accompanied by a non-refundable administrative fee of USD\$20,000.00 as well as the following documents or information:

**1.1 BASIC INFORMATION**

- a. Company's Name and Address.
- b. Street and Mailing Address of the Applicants' principal office,
- c. Direct Telephone Number, Fax Number and Email Address, if available,
- d. Certificate of Incorporation,
- e. Certificate to Commence Business,
- f. Regulations 8 to 82; Second Schedule to the Companies Code, 1963 (Act 179)
- g. Proof of Title to the land,
- h. Feasibility studies of the Refinery project.

**1.2 BASIC DESIGN AND CONCEPT ENGINEERING**

To facilitate the approval, the following data shall be provided by the applicant:

**1.21 Conceptual Study**

- i. Preliminary Marketing Plan, indicating whether domestic, export, or if both markets are being targeted.
- ii. Preliminary product slate, indicating volumes or tonnage and product specifications. The specifications must conform to local specifications if the product is to be sold on the domestic market.

[1]



## 2.1 ENGINEERING DESIGN AND PROCUREMENT

The detailed engineering and equipment specifications shall conform to acceptable National/International Standards listed in **Appendix 1** or their equivalents, so as to guarantee the safety and operability of the plant and equipment.

The following documents shall be submitted to the Authority to ensure compliance:

- i. Process Flow Diagram, Detailed Piping and Instrumentation Diagram (P&ID) of the process units, utilities and off sites,
- ii. Final process technology selection and licensors,
- iii. Detailed Material balances,
- iv. List of equipment,
- v. Equipment test procedures,
- vi. Approved building plans,
- vii. Quality control program of the designers,
- viii. Final Project implementation schedule,
- ix. Detailed Post Construction Environmental Impact Assessment,
- x. Detailed crude oil (feedstock) supply and product meter proving procedure and evacuation schemes and
- xi. Electrical single line diagrams.

The Authority's Engineers shall participate in the project monitoring/construction and supervision, including all project review meetings. The Authority's Engineers shall liaise with the project consultant to monitor the progress of work during the constructional phase of the project. Additionally, the project proponent shall provide logistical support to the Authority for project monitoring.

## 2.2 CONSTRUCTION PERMIT FEE FOR REFINERY

The Refinery construction permit fee is based on the production capacity of the Refinery as detailed in **Table 1.0** below:

<b>Production Capacity</b>	<b>Less than 1,000 MT/day</b>	<b>1,000-5,000 MT/day</b>	<b>Greater than 5,000MT/day</b>
<b>Fees (USD)</b>	<b>30,000.00</b>	<b>75,000</b>	<b>100,000.00</b>

**Table 1.0**

## C LICENCE TO OPERATE

Following the completion of mechanical erection, the Authority's Engineers will carry out on-the-spot physical inspection of the plant to ascertain conformity with the approved design. Upon the receipt of a satisfactory report, the Authority will grant approval for commissioning of the plant and subsequently issue a license to operate the Refinery.

**APPENDIX 1**  
**REFERENCE CODES**  
**STANDARDS AND SPECIFICATIONS**

The design parameters shall among others generally follow the specifications codes outlined in the current editions of:

- Refining Safety Code Part 3 of the Institute of Petroleum Model Code of Safe Practice.-
- API Standard 2510 Design and Construction of LP Gas Installation at Marine and Pipeline Terminals, Natural Gas Processing Plants, Refineries, Petrochemical Plants and Tank Farm.
- API Recommended Practices 520 and 521 for pressure relieving and depressurizing systems.
- National Fire Protection Association (NFPA) Standards No. 59A.
- Liquefied Petroleum Gas Association Code of Practice.
- Electrical Safety Code: Part 1 of the Institute of Petroleum Model Code of Safe Practice
- American National Standard Institute (ANSI) B31.3-Process Piping for Chemical Plant and Petroleum Refining.
- American Society of Mechanical Engineers – ASME – Boiler Pressure Vessel Code, (Section 1).
- American Society of Mechanical Engineers (ASME) Mechanical Standards Class “B” Heat Exchangers Section 7.
- API 510 Pressure Vessel inspection code – Maintenance, inspection, rating, repair and alteration.
- API RP 550 Manual on installation of Refinery instruments and control systems.
- API Standard 650 Welded steel tanks for oil storage
- National Electrical Manufacturers Association (NEMA)
- Tubular Exchanger Manufacturers Association (TEMA) Standards for shell and tube exchangers.

Appendix 5-1.1

Details of Results of Water Analyses

V1A



**Analysis Results**

Water Research Institute, Environmental Chemistry Division

CSIR Premises, Airport Res. Area

P. O. Box M. 32

Accra, Ghana

Phone: (+233-21) 775351/52 Fax: (+233-21) 777170 E-mail: info@csir-water.com

Order ID

Company Name: SOL

Contact First Name

Contact Last Name

Billing Address

Postal Code

City

Community

Site Name

Sample V1

Receipt date: 11/03/20

Analysis start date: 11/03/20

Analysis stop date: 24/03/20

Parameter	Method No.	Unit	Value	GS 175-1 WHO Guideline values	GS1212:2019
Turbidity	3	NTU	52.2	5	75.0
Colour (apparent)	2	Hz	150	15.0	200
Odour		-	-	Inoffensive	-
pH	4	pH Units	7.94	6.50-8.50	6.0-9.0
Conductivity	1	µS/cm	7600	-	1500
Tot. Susp. Solids (SS)	5	mg/l	100	-	50.0
Tot. Dis. Solids (TDS)	6	mg/l	4596	1000	1000
Sodium	30	mg/l	1304	200	-
Potassium	29	mg/l	13.5	30.0	-
Calcium	23	mg/l	134	200	-
Magnesium	26	mg/l	227	150	-
Total Iron	31	mg/l	0.046	0.300	5.00
Ammonium (NH <sub>4</sub> -N)	13	mg/l	0.155	0.00-1.50	1.00
Chloride	24	mg/l	2551	250	250
Sulphate (SO <sub>4</sub> )	19	mg/l	120	250	250
Phosphate (PO <sub>4</sub> -P)	17	mg/l	0.235	-	2.00
Manganese	26	mg/l	0.323	0.400	-



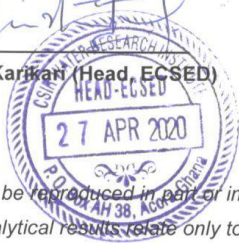
VIB

Parameter	Method No.	Unit	Value	GS 175-1 WHO Guideline values	GS1212:2019
Nitrite (NO <sub>2</sub> -N)	14	mg/l	0.070	1.00	-
Nitrate (NO <sub>3</sub> -N)	15	mg/l	0.859	10.0	50.0
Total Hardness (as CaCO <sub>3</sub> )	25	mg/l	1268	500	-
Total Alkalinity (as CaCO <sub>3</sub> )	22	mg/l	414	-	150
Calcium Hardness (as CaCO <sub>3</sub> )	23	mg/l	336	-	-
Mag. Hardness (as CaCO <sub>3</sub> )	26	mg/l	932	-	-
Fluoride	20	mg/l	<0.005	1.50	10.0
Bicarbonate (as CaCO <sub>3</sub> )	22	mg/l	505	-	-
Carbonate	22	mg/l	0.00	-	-
DO	-	mg/l	4.80	-	-
COD	-	mg/l	57.0	-	250
BOD	-	mg/l	6.90	-	50.0

Approved by:



Dr. Anthony Yaw Karikari (Head, ECSED)



The report shall not be reproduced in part or in full, without the written approval of the test laboratory. The analytical results relate only to the samples analysed. The bracket (<) indicates value below detection limit.

FZA



## Analysis Results

Water Research Institute, Environmental Chemistry Division

CSIR Premises, Airport Res. Area

P. O. Box M. 32

Accra, Ghana

Phone: (+233-21) 775351/52 Fax: (+233-21) 777170 E-mail: info@csir-water.com

**Order ID**

**Company Name: SOL**

**Contact First Name  
Billing Address**

**Contact Last Name**

**Postal Code**

**City**

**Community**

**Site Name**

**Sample FZ1**

**Receipt date: 11/03/20**

**Analysis start date: 11/03/20**

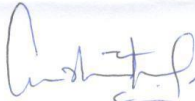
**Analysis stop date: 24/03/20**

Parameter	Method No.	Unit	Value	GS 175-1 WHO Guideline values	GS1212:2019
Turbidity	3	NTU	78.0	5	75.0
Colour (apparent)	2	Hz	150	15.0	200
Odour		-	-	Inoffensive	-
pH	4	pH Units	7.71	6.50-8.50	6.0-9.0
Conductivity	1	µS/cm	2830	-	1500
Tot. Susp. Solids (SS)	5	mg/l	113	-	50.0
Tot. Dis. Solids (TDS)	6	mg/l	1698	1000	1000
Sodium	30	mg/l	362	200	-
Potassium	29	mg/l	90.0	30.0	-
Calcium	23	mg/l	62.1	200	-
Magnesium	26	mg/l	60.9	150	-
Total Iron	31	mg/l	0.650	0.300	5.00
Ammonium (NH <sub>4</sub> -N)	13	mg/l	0.465	0.00-1.50	1.00
Chloride	24	mg/l	844	250	250
Sulphate (SO <sub>4</sub> )	19	mg/l	30.0	250	250
Phosphate (PO <sub>4</sub> -P)	17	mg/l	0.347	-	2.00
Manganese	26	mg/l	0.527	0.400	-

F2B

Parameter	Method No.	Unit	Value	GS 175-1 WHO Guideline values	GS1212:2019
Nitrite (NO <sub>2</sub> -N)	14	mg/l	0.124	1.00	-
Nitrate (NO <sub>3</sub> -N)	15	mg/l	1.10	10.0	50.0
Total Hardness (as CaCO <sub>3</sub> )	25	mg/l	406	500	-
Total Alkalinity (as CaCO <sub>3</sub> )	22	mg/l	200	-	150
Calcium Hardness (as CaCO <sub>3</sub> )	23	mg/l	155	-	-
Mag. Hardness (as CaCO <sub>3</sub> )	26	mg/l	261	-	-
Fluoride	20	mg/l	<0.005	1.50	10.0
Bicarbonate (as CaCO <sub>3</sub> )	22	mg/l	244	-	-
Carbonate	22	mg/l	0.00	-	-
DO	-	mg/l	0	-	-
COD	-	mg/l	350	-	250
BOD	-	mg/l	134	-	50.0

Approved by:



Dr. Anthony Yaw Karikari (Head, ECSED)



The report shall not be reproduced in part or in full, without the written approval of the test laboratory. The analytical results relate only to the samples analysed. The bracket (<) indicates value below detection limit.





**COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH**  
**WATER RESEARCH INSTITUTE**

Our Ref:

18th March, 2020

**ANALYTICAL REPORT**

MR. BEN NOBIYA

Tel:

Attn: Mr. Ben Nobiya

Date of Arrival : 09.03.20  
Time of Arrival : 01:30 p.m.  
Start of Analysis: 09.03.20  
End of Analysis : 11.03.20

Journal Number EBHD 03-20-53

Sample Identification	Total Coliform (TC) (cfu/100ml) Method: APHA 9222A	Faecal Coliform (FC) (cfu/100ml) Method: APHA 9222D	<i>E. coli</i> (cfu/100ml) Method: APHA 9260F	Total Heterotrophic Bacteria (cfu/1ml) Method: APHA 9215B
F24	372x10 <sup>2</sup>	93x10 <sup>2</sup>	93x10 <sup>2</sup>	142x10 <sup>2</sup>
Y14	21x10 <sup>2</sup>	20x10 <sup>2</sup>	0	131x10 <sup>2</sup>
Ghana Standards GS 175-1	0	0	0	500
WHO Guidelines	0	0	0	-

REMARKS: These results apply only to the samples tested.

Yours sincerely,

Dr. Gloria Addico  
Head, Environmental Biology & Health Division

**Appendix 5-2.1****List of Species of Flora in the Project Area*****Trees and Shrubs***

Avecinnia africana  
Cocos nucifera  
Dialum guineense  
Lagerstromia speciosa  
Musa paradisiaca  
Persea americana  
Phyllanthus amarus  
Terminalia catapa  
Azadirachta indica  
Conocarpus erectus  
Elaeis guineensis  
Mangifera indica  
Parkinsonia aculeata  
Pithecelobium dulce  
Ricinus communis  
Zanthoxylem xanthoxyloides

***Herbs***

Agave sisalana  
Alternanthera pungens  
Cassia heisuta  
C. occidentalis  
Commelina sp.  
Cuscuta australis  
Cyperus rotunda  
Ipomea aserifolia  
Nerium sp. (Oleander)  
Oldenlandia corymbosa  
Pupalia lappaca  
Scoparia dulcis  
Solanum melonginia  
Stacytarpheta cayanensis  
Tridax procumbens  
Vigna ambacensis  
Aloe buettneri  
Callotropis procera  
C. mimosoides  
Cleome viscosa  
Crotolaria retusa  
Cyperus articulatus  
Euphorbia heterophyla  
Ipomea involucrata  
Lemna paccicostata  
Physalis angulata  
Rhyncospora corymbosa  
Sessuvium portulacastrum  
S. nigrum  
Striga sp.  
Typha domingensis

***Grasses***

Andropogon gayanus  
Cynodon dactylon  
Eleusine indica  
Panicum repens  
Paspalum arundinaceum  
P. Vaginatam  
S. virginicus  
Chloris pilosa  
Dactyloctenium aegyptium  
Imperata cylindrica  
Sorghum arundinaceum  
Paspalum orbiculare  
Sporobolus robustus  
Vetiveria fulvibarbis

***Phytoplankton***

Chlorophyta (Green algae)  
Scenedesmus sp.  
Staurastrum sp  
Ulothrix sp.  
Bacillariophyta (Diatoms)  
Diatoma  
Melosira  
Nitzschia  
Synedra  
Cyanophyta (Blue-green algae)  
Agmenellum  
Oscillatoria  
Anabaena  
Spirulina  
Gyrosigma  
Navicula  
Stephanodiscus

## Appendix 5-2.2 List of Fauna in the Project Area

<i>Common Name</i>	<i>Latin Name</i>
<b><i>Birds</i></b>	
Common/Hooded Vulture	Neophron monachus
Pied Crow	Corvus albus
Cattle Egret	Ardeola ibis
Grey-headed Bulbul	Pycnonotus barbatus
Kingfisher	Halcyon senegalensis
Common Tern	Sterna hirundo
Grey heron	Ardea cineria
Striped swallow	Hirundo abyssinica
Ahanta francolin	Francolinus ahantensis
Grey-headed sparrow	Passer griseus
<b><i>Rodents</i></b>	
Ground squirrel	Xerus erythropus
Giant rat	Cricetomys gambianus
Field mice	
<b><i>Reptiles</i></b>	
Boscs monitor	Varanus exanthematicus
Agama lizard	Agama agama
African python	Python sebae
Black cobra	Naja melano leuca
Skink	Scinidae
Scorpion	Chactas sp.
<b><i>Fishes</i></b>	
Cat fish	Clarias sp.
Cichlids	Hemichromis fasciatus
	Tilapia zillii
	Sarotherodon melanotheron
Brackish land crab	Cardiosoma armata
Sand crab	Ocypode africana
Mangrove oyster	Crassostrea gasar

Appendix 6-1.1

List of Stakeholders Consulted

10 February 2020

SENTUO OIL REFINERY Ltd.

List of stakeholders consulted.

Name	Designation/Address	Signature/date
Nii Adjety Agbo II	Mankralo - TIC	
Nuumo Ashiboye Koti II	Sakumo Wulams - TIC	
Nuumo Abo Dede Hamkii	Naa yoo Wulams - TIC	
Nii Amach Somponu II	Shipi - TIC	
Nii Tetteh Atanya II	Adigon Mantse - TIC	
Nii Tetteh Isuru Orlor III	Akwashongtse - TIC	
Nii Odumetey II	Woleiatse - TIC	
Nii Amach Akitipoi II	Okyeame - TIC	
Nii Annang Adzor	Ashaimon Regent - TIC	
Jeffrey N.A. Lamo	Registrar - TIC	
Noah Mantey	Asst. Registrar - TIC	
Francis Anah	Sentuo Oil Ref.	
Gordon Aken-Yemga	EPL	
Ozorwaa Awulu	Sentuo Oil Ref.	
S. B. Madiya	EPC	
Charles BINEY	EPL	
Barnabas Amisibo	EPL	



10 February 2020

SORL MEETINGS WITH EPL ON EIA

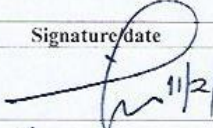
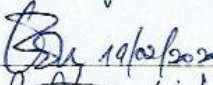
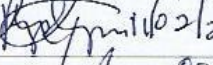
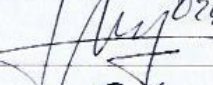

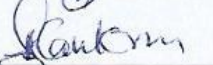

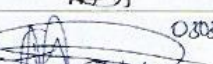
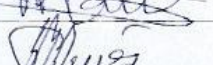

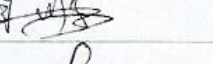
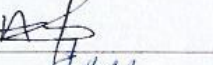


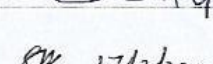
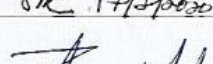
16<sup>th</sup> FEB 2020

NAME	ORGANIZATION	Tel No	E-mail
1. Samani Baen Nobiya	EPL	0244530911 0243813550	S110btye@gmail.com yanga16@yahoo.com
2. Gordon Akon-Yamga	EPL		
3. Barnabas Amisigh	EPL	0243947776	bba@barnabas002@yahoo.com
4. Charles Biney	EPL	0244374556 0244760680	cbiney@gmail.com sentuo@gmail.com
5. JOJO NUTAKOR	Sentuo Group		
7. Emmanuel Ayansu	Sentuo	0244323113	eayansu@yahoo.com
8. Francis Anebh	✓	024470340	anebh@yahoo.com
9. Oforiwa Dusuwa	✓	0507270155	Oforiwa@northwestgh.com

11&12 February 2020

SENTUO OIL REFINERY Ltd.

List of stakeholders consulted.

Name	Designation/Address	Signature/date
<del>Paras</del> SENTUO	VALCO, Box 625, Tema	 11/2/2020
Emmanuel Akyea MAS	GEL, Box 14A 16105 Accra TEMA-GHANA	 19/02/2020
Mawunyo PUPLAN	PMB 283 Community 1	 10/2/2020
Agathe WODIE	#0 BOX SC 376 VALCO	 0247273785
ODURO JOHN (DSP)	POLICE RHQ /TEMA	
Don Williams + Brandon	G. NTS /TEMA	
Mercy Gwikpa	EPA-Tema	
Hilda Nuss	ECG-Tema	 0308816611
SABU MUMUNI ABATTOIR		
LITABO ZITA	SOL cement	
Akosua Tema	GWL Tema	
Bright Andy Berko	GHHA Tema	
Esther Anku	Chief Inspector	
Sylvester Inkoom	Head (Inspection & Monitoring)	 17/2/2020
Imprah Fuhiri	Minister (Infrastructure & Planning)	
Benjamin Dade 16/pe	Petroleum Commission Sr. Max E office	

0549293024



12-26 February 2020

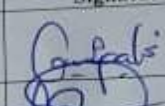
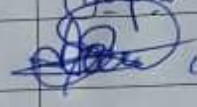
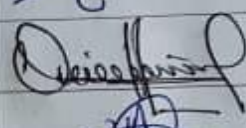

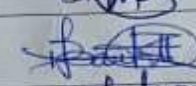
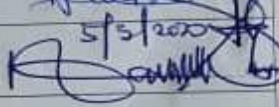
**SENTUO OIL REFINERY Ltd.**  
List of stakeholders consulted.

Name	Designation/Address	Signature/date
Daniel Eduful	QHSE Manager Sonapack GH Ltd (Toma)	
Isaac Ampofo	Engineer Ministry of Energy	
Mdau mensah	Water Resources Comm	
	18-02-2020	
Mhaji Shikw A-Kodin	med Tema (TMA)	
Sakina Nyankomawan	Planning Officer (TMA)	
	26 February 2020	
Irene Opoke	EPA - Greater Accra East	
Godsway Kotoku	MDPU	
Patrick Ackong	Eng/Architect	
W. Ojose-Sankyi	MDPU - TMA	
Nelson Aditsey	EHU - TMA	
Chelpang Yakubu	MDPU - TMA	
Kumah Beuben	MDPU - TMA	

05 March 2020

SENTUO OIL REFINERY Ltd.

List of stakeholders consulted.


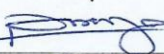

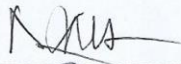
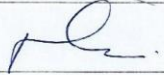
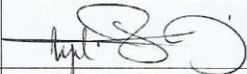

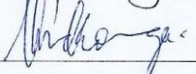
Name	Designation/Address	Signature/date
Ing. Mac-Dre Hanyabui	GWCL, Tema	 19/02/2020
Patrick Awoatwe	GWCL, Tema	 19/02/2020
05 - 03 - 2020		
Mike Gwusu Amosko	Med KKMA	
James Pratt	TDR	
Emoshio Clottey	KKMA - PPD officer	 5/3/2020
Samuel Smafi Kyi	KKMA - Muv. Eng.	

10 March 2020

10-03-2020

SENTUO OIL REFINERY Ltd.

List of stakeholders consulted.

Name	Designation/Address	Signature/date
Francis Opolcu-Boateng	TECH. DIRECTOR.	
Prosper Nuhoho	Maint/Eng Director	
Edward Arthur	Technical	
H. ADU-AGYEI	PLANT ENGINEER	
S. B. Nohoya	EPL	
Charles Biney	EPL	
Mike Tsigbey	EPL	
Gordon Akim-Lanyo	EPL	



**TEMA DEVELOPMENT CORPORATION**

P. O. BOX 46  
TEMA - GHANA  
TEL : 233 (303) 202731-4  
FAX : 233 (303) 202737  
233 (303) 207162  
E-mail : tdc@tdc.org.gh

IND/A/20/1-3,21/1B

Our Ref.....

Your Ref.....

Date: 28/12/2011

Dear Sir,

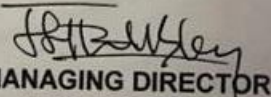
**APPLICATION FOR INDUSTRIAL PLOT NOS. 20/1-3,21/1B**  
**INDUSTRIAL – TEMA**

It is proposed to lease to you the above-mentioned plot measuring approximately 217.11 Acres (87.89 HA) on the following basis:

- i. **TERM:** 60 years commencing from date right of entry is granted,
- ii. **GROUND RENT:** You are required to pay a pepper- corn rent of GH¢1.00 per acre per annum.
- iii. **USER:** The land shall be used for the erection of Factories only.
- iv. **BUILDING PERIOD:** You will be expected to commence building operations within 6 months of the site being handed over, subject to a reasonable extension for legitimate cause of delay and to have the plot fully developed within 2 years from the date right of entry has been granted.
- v. **BUILDING PLAN:** Proposals for the development of the plot and site plans must be submitted to the Corporation for approval and a Building Permit obtained prior to commencement of any building operations.
- vi. **OTHER COVENANTS AND CONDITIONS**
  - (a) The lessee shall be responsible for all outgoing including Rates and Taxes,
  - (b) The lessee shall pay all legal and other expenses in connection with the preparation of the lease.
  - © The lessee shall not be permitted to sublet or transfer the whole or part of the plot.
  - (d) The lease shall contain all such other covenants that are normally included in lease of land in the Tema

- (e) When some plots are sold to any Institution the lessee will surrender the ground lease of each plot for terms to be agreed between the purchaser and the Tema Development Corporation.
2. Notwithstanding any provisions contained herein, your tenancy shall be subject to any new policy, rules and bye-laws that may be adopted and or passed by the Tema Development Corporation and or the Government in so far as it affects or they affect the Tema Development Corporation.
3. Your written acceptance of this offer together with first year's ground rent fee must reach the Corporation within one calendar month from the date hereof. It must be emphasized that this offer will lapse if not accepted within the time stipulated.
4. As soon as we are satisfied that there is an uninterrupted and substantial physical development of the plot, our Legal Department will be advised to commence action on the preparation of the lease.
5. The Site Plan of the area allocated is attached.

Yours faithfully,

  
MANAGING DIRECTOR  
(JOE ABBEY)

THE CO-ORDINATOR,  
TEMA TRADITIONAL COUNCIL  
P.O. BOX TT 22  
TEMA MANHEAN.

cc: Managing Director  
Director of Finance  
Director of Development  
Internal Auditor  
Records  
Float

**TEMA TRADITIONAL COUNCIL**  
( Stool Lands Administration )

KPUSHI ADOMIA KOTU OKROBON

Tema Mamea

Our Ref

Your Ref



Tel: 022 205557  
022 201231

Date: 04/01/12

**THE MANAGING DIRECTOR  
TEMA DEVELOPMENT CORPORATION  
TEMA**

Dear Sir,

**RE: APPLICATION FOR INDUSTRIAL PLOT NOS.20/1-3, 21/1B INDUSTRIAL – TEMA**

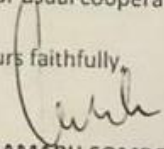
We refer to your letter number IND/A/20/1-3, 21/1B dated 28<sup>th</sup> December, 2011 on the above subject (a copy is attached for ease of reference) and write to express our appreciation to you and hereby also state our acceptance of the offer.

We wish to make payment to cover five years for the Ground Rent fee and shall be grateful for a prompt response if it is acceptable by your corporation.

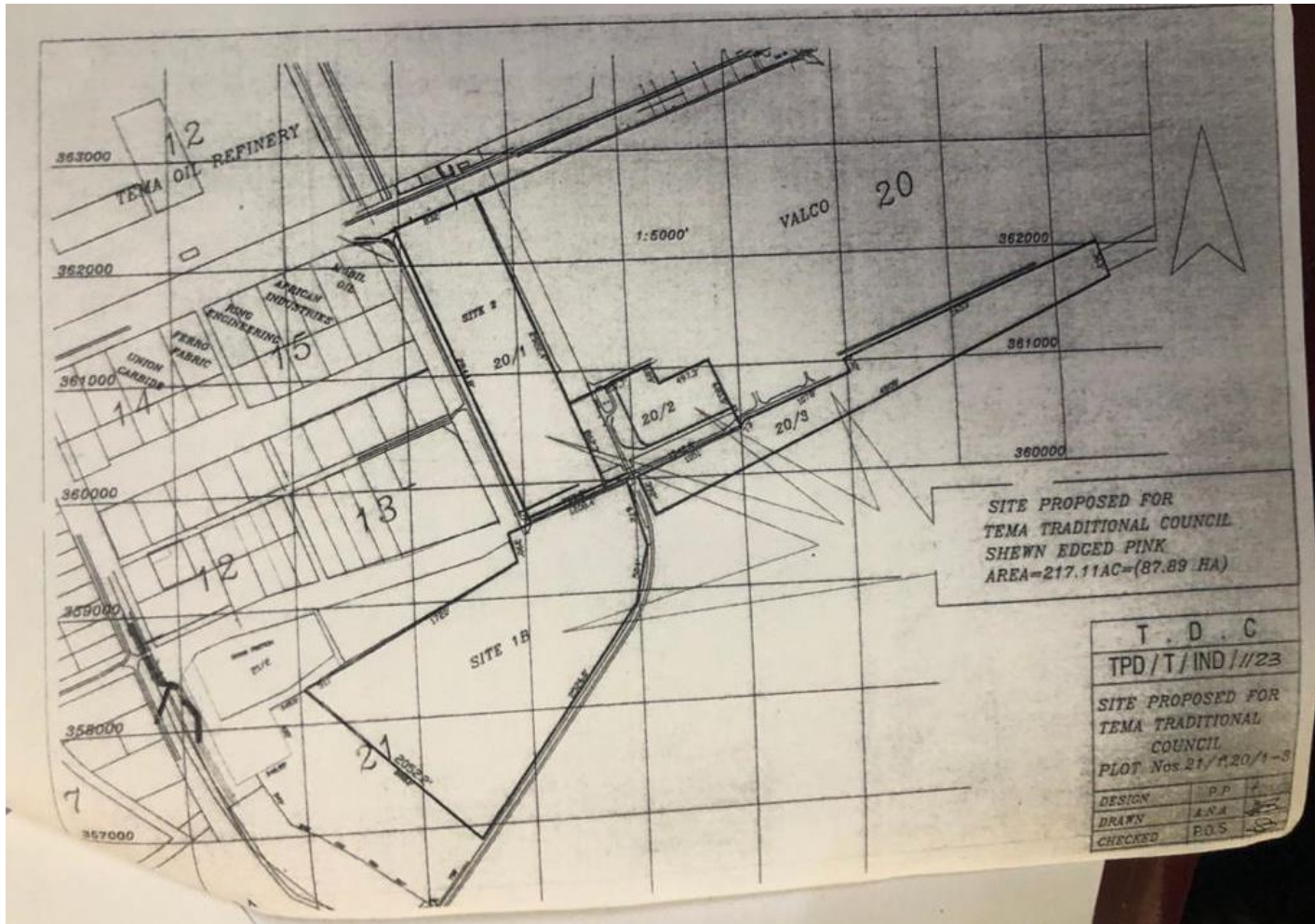
Further, a crosscheck on the grounds indicate a deficit of about 28 acres per the dimensions of the offer and so we would be thankful to you if you could arrange for your surveyors and ours to visit the site at your earliest convenient time to determine the actual size of the offer.

Your usual cooperation is appreciated.

Yours faithfully,

  
**NII AMARH SOMPONU II  
STOOL SECRETARY**





Appendix 6-2.2

Response from Ghana National Fire Service

*In case of reply the number and date of this letter should be quoted*



Ghana National Fire Service  
Regional Headquarters  
P. O. Box 683  
Tema - Ghana  
Tel: 0303 - 202518  
0303 - 202554

NFS/TR.6/VOL.II<sup>A</sup>/28  
My ref: No. ....  
Your Ref. No. ....

Date: 20 March, 2020

THE DIRECTOR  
ENVIRONMENTAL PARTNERSHIP LIMITED  
P.O. BOX KN 4192  
KANESHIE-ACCRA

**RE: ENVIRONMENTAL IMPACT ASSESSMENT OF PROPOSED  
REFINERY AT TEMA IN THE GREATER ACCRA REGION**

1. Your letter No. EPL/20/SENTUO/03 dated 31<sup>st</sup> January, 2020 on the above subject matter refers.
2. We appreciate efforts by your client to construct and operate an Oil Refinery in the Industrial Enclave of Tema.
3. In connection with the establishment of an Oil Refinery, the Fire Precaution (Premises) Regulation requires the Ghana National Fire Service to be involved in the pre-construction stage up to the operational stage.
4. At every stage of the project, the following are some roles the Ghana National Fire Service will play.
  - Feasibility Assessment/Reports
  - Issuance of Fire Permits
  - Consultation with relevant stakeholders
  - Routine Inspections
  - Issuance of Fire Certificate upon completion
5. We would appreciate it if the Ghana National Fire Service is fully consulted at each stage of the project.
6. Attached is an estimate of cost to be incurred by Sentuo Oil Refinery Limited as part of the various roles to be played by the Service. However, this cost is subject to the provision of actual drawings to be submitted to the Ghana National Fire Service and other exigencies.

  
TIMOTHY OSAFIO-AFFUM  
DOI, 2IC  
for: REGIONAL FIRE OFFICER

**ELECTRICITY COMPANY OF GHANA LTD.**

ELECTRO-VOLTA HOUSE



Your Ref.....

Our Ref. MD/EGO/V:1/05 Date 16<sup>th</sup> April, 2020.....

P. O. Box GP 521 Accra -Ghana

TEL: No. +233 (0) 302-676727-47

FAX: No. +233 (0) 302-666262

MAIL: ecgho@ecgh.com

Sentuo Oil Refinery Ltd  
 P.O. Box CT 1470,  
 Cantonments,  
 Accra  
 Tel: +233245805835

Attn: Xu Ning Kuan

Dear Sir,

RE: RELOCATION OF 33kV PYLONS

RESPONSE TO YOUR REQUEST FOR A REDUCTION IN THE QUOTATION FOR THE PROJECT

We refer to your letter dated 24th March 2020 on the above subject matter. We have carefully considered your request for a reduction in your capital contribution to the project. We are pleased to inform you that ECG has agreed to reduce it further by 5%, bringing the total reduction to 25% of the project cost. Based on the above, the payment for the two (2) design options are as follows:

- a) Use of Basic Tower Heights (17m): The cost of implementing the project using this design option is estimated at GH¢1,489,226.95. With the 25% reduction ECG is offering, you are required to pay the remaining 75% as your capital contribution amounting to GH¢1,116,920.21 with the breakdown as follows:
- |                                       |   |               |
|---------------------------------------|---|---------------|
| • Prime Cost (including contingency)  | = | GH¢826,582.95 |
| • Company Charges (15% of Prime Cost) | = | GH¢123,987.44 |
| • VAT & NHIL Charges                  | = | GH¢166,349.82 |

For record purposes, please note that the scope of works for the relocation of the referenced portions of the two (2) ECG tower lines includes the supply & installation of:

- 3No. SS, 1No. AC, 3No. DE and 1No. DE+90degree double circuit tower structures of 17m basic heights complete with connecting accessories.
- 9No. 14m and 5No. 12m & 14m Steel Tubular Poles complete with connecting accessories.





- Removal of 2No. AC & 2No. SS Double Circuit Towers, 3No. SS & 1No. AC Single Circuit Towers all complete with the surface portion of the foundation as well as retiring of 1500m of 265sq.mm and 3100m of 400sq.mm All Aluminium Conductor.
- Stringing of about 5650m of 400sq.mm and 3000m of 265sq.mm All Aluminium Conductor.

b) Use of Higher Tower Types (23m): The cost of implementing the above scope of works using 23m double circuit tower heights in place of the 17m basic height design option is estimated at GH¢1,571,865.32. With the 25% reduction ECG is offering, you are required to pay the remaining 75% as your capital contribution amounting to GH¢1,178,898.99 with the breakdown as follows:

• Prime Cost (including contingency)	=	GH¢872,450.69
• Company Charges (15% of Prime Cost)	=	GH¢130,867.60
• VAT & NHIL Charges	=	GH¢175,580.70

As stated in our earlier quotation letter, the successful relocation of the line is dependent on us (i.e. Sentuo & ECG) engaging GRIDCo for an official permission since the proposed routes mostly fall within the Right-of-Way of their 330kV and 161kV lines around the project area. You are therefore expected to confirm in writing, whether you are committed to proceeding with this work for the above Right-of-Way permit to be secured.

Please take note of the following key issues on the payment:

- 1) This quotation is subject to acceptance within four (4) calendar weeks from the date of this letter. You would be required to pay the difference in cost if any changes occur in the material and labour prices after this deadline.
- 2) Payment for this project shall be by banker's draft. Other acceptable modes of payment include cash or direct bank transfer. **Payments by personal or corporate cheques shall NOT be accepted.** Kindly note that any bank charges on the use of the direct bank transfer mode of payment shall be borne by Sentuo and NOT ECG.
- 3) For payment through direct bank transfer, the company's (Electricity Company of Ghana Ltd) Cedi Account details below must be used:
  - Account Name: ECG Account 3
  - Account Number: 1011130000421
  - Name of Bank: Ghana Commercial Bank (GCB) Ltd
  - Branch: High Street, Accra

- 4) The narration accompanying the payment should state “that the payment is in favour of Sentuo Oil Refinery Limited, and that it is a customer deposit”.

Please endeavour to officially submit evidence of payment to the Director of Engineering of ECG.

Yours faithfully,



**KWAME AGYEMAN-BUDU**  
MANAGING DIRECTOR

Cc: DMD/Engineering & Operations, ECG  
Director of Operations, ECG  
General Manager/Tema, ECG



# NATIONAL PETROLEUM AUTHORITY

No. 6 George Walker Bush Highway, Dzorwulu, Accra

C.P.M.B  
Cantonments, Accra

Tel: +233 302 766 195/6

Email: [info@npa.gov.gh](mailto:info@npa.gov.gh)  
Website: [www.npa.gov.gh](http://www.npa.gov.gh)

NPA/IML/APL/01/12

28<sup>th</sup> February, 2020

The Director  
Environmental Partnership Limited  
Accra

**Re: Environmental Impact Assessment of Proposed Oil Refinery at Tema in the Greater Accra Region**

We refer to your letter dated 31<sup>st</sup> January, 2020 in respect of the above subject matter.

The Authority has taken note of Sentuo Oil Refinery Limited's (SORL) intent to construct and operate an oil refinery facility at Tema in the Tema Metropolitan Area of the Greater Accra Region.

We wish to indicate that, there are existing requirements for undertaking such projects. Kindly find attached a copy of the Authority's Public Notice NPA N.017 which outlines the requirements for the grant and issuance of a permit to construct a petroleum refinery/petrochemical plant for your guidance and compliance. Additionally, attached is the Ministry of Energy's Public Notice to prospective Refinery Investors in respect of the requirement to establish a petroleum refinery in Ghana for your consideration.

Please do not hesitate to contact the Inspections and Monitoring and HSSE Department of the Authority should you require further clarification.

**Esther Anku**  
**(Chief Inspector)**  
**For: Chief Executive**

*Cc: The Lead Consultant, Sentuo Oil Refinery Limited, Accra. (Tel: 0545504092/ 0245805835)*







## WATER RESOURCES COMMISSION

Registered Office/Courier Address  
 No. E4 Leshie Crescent  
 Labone Estates  
 Accra-Ghana

Postal Address  
 P.O. Box CT 5630  
 Cantonments  
 Accra-Ghana

Our Ref: WRC/WI/V5/07

Date: February 20, 2020

Your Ref:

**Director**  
**Environmental Partnership Limited**  
**P. O. Box KN 4192**  
**Kaneshie - Accra**

Dear Sir,

**RE: ENVIRONMENTAL IMPACT ASSESSMENT OF PROPOSED OIL REFINERY AT TEMA IN THE  
 GREATER ACCRA REGION**

We write to acknowledge receipt of your letter with reference no. EPL/20/SENTUO/03 and dated 31 January 2020 on the above subject matter.

The Commission has assessed the site plan for the proposed site of the construction and operation of an oil refinery at Tema on Industrial Plot No. IND/HI/21/5 and comments as follows:

1. Construction and operation activities within and around the site should not have any negative impacts on the quality and quantity of any streams, rivers, lagoons, or boreholes in the vicinity, should not degrade existing vegetative buffer areas along water bodies and should not cause flooding of the company's site, and surroundings including the Tema Newtown Township.
2. A vegetative buffer zone of at least 20 m wide should be left around any stream flowing within or around the boundary of the site. Refer to the Buffer Zone Policy for recommended widths via this link: <http://www.wrc-gh.org/documents/acts-and-regulations/>
3. Ensure that the Tema Newtown Township and traditional heads are officially aware of and agree with the impending project to prevent avoidable conflicts in the future.
4. Sentuo Oil Refinery Limited should not divert, dam, store, abstract, use raw water resources (both surface and groundwater i.e. borehole) or construct boreholes without the official consent of the Commission through the submission of a filled Water Use application or Drillers Licence Form. The forms can be downloaded via this link: <http://www.wrc-gh.org/documents/forms/>

For further information and clarification, do not hesitate to contact the undersigned.

Yours faithfully,

**For: Executive Secretary**  
**Esi Biney**  
**(Principal Officer-Ecology)**