

# GUIDELINES TO DEMONSTRATE COMPLIANCE WITH THE EMP PRINCIPLES FOR OIL FIELDS IN CHAD

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## PREAMBLE

1. This note provides guidelines that clarify the environmental management requirements for future oil development in Chad. The guidelines will apply to all developers of new oilfields who propose to transport oil through any part of the Chad-Cameroon Pipeline.
2. The requirements arise from the Loan Agreement between the Republic of Chad and the International Bank for Reconstruction and Development (IBRD) for the Petroleum Development and Pipeline Project, and from associated Project Agreements with COTCO, TOTCO, Esso Chad, Chevron and Petronas<sup>1</sup>. The Loan Agreement states that (Section 4.10): *“The Borrower shall ensure that any oil developed outside the Doba Basin Oil Fields<sup>2</sup> which is proposed to be transported through any part of the Transportation System in Chad is developed in accordance with the principles set forth in the EMP with respect to environmental analysis and protection, consultation, information disclosure, resettlement and compensation and with the equivalent legal and administrative approval processes and information disclosure as applied with respect to the oil developed in the Doba Basin Oil Fields.”*<sup>3</sup> Similar wording also appears in the Loan Agreements between IFC, COTCO, TOTCO, Esso Chad, Chevron Petroleum Chad and Petronas Carigali (Chad EP).
3. The guidelines will allow users of the Pipeline to be in compliance with the conditions set down in the various Loan and Project Agreements for the use of the Pipeline. They constitute an intermediate step towards the incorporation of the Environmental Management Plan (EMP) Principles for the Chad Export Project<sup>4</sup> into the laws and regulations of the Government of Chad. They might also serve as an input into a code of conduct that the petroleum industry in Chad would prepare for the management of petroleum transportation contracts through the Chad-Cameroon pipeline.
4. The Loan Agreement defines the EMP as that part of the Environmental Assessment (EA)<sup>5</sup>, as detailed in Annex II, which describes the measures and actions that

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<sup>1</sup> The relevant sections are: Section 4.10, (b) for the Government of Chad, Section 2.10, (b) for COTCO, Section 2.10, (b) for TOTCO, Section 2.09, (b) for Esso Chad, Section 2.08 for Chevron Petroleum Chad, and Section 2.08 for Petronas Carigali (Chad EP).

<sup>2</sup> "Doba Basin Oil Fields" is defined as the Kome, Bolobo and Miandoum oilfields in the southern part of the territory of the Borrower (Chad).

<sup>3</sup> The corresponding provisions in the Loan Agreements signed between IFC and the separate members of the Consortium and their related companies refer to "Crude other than Three Fields Petroleum".

<sup>4</sup> The official name of the IBRD funded project is "Petroleum Development and Pipeline Project". However, the name used in the EMP for this project is "Chad Export Project". The two names refer to the same project.

<sup>5</sup> According to the Loan Agreement (Page 6, (z)), "EA" means the environmental assessment documentation for the Project, consisting of all the documents referred to in Schedule 5 to this

will be implemented by the Government of Chad and Esso Chad during the design, construction and operation of the Project, to “*eliminate, mitigate, reduce or address identified biophysical, socio-economic, socio-cultural, health and other similar issues and their impacts, to acceptable levels defined in the EA and to monitor the same...*” (Page 6 of the Loan Agreement)<sup>6</sup>.

5. The EA and EMP for the Chad Export Project were specifically prepared to comply with the safeguard policies of the World Bank Group that were applicable in 1999. The Bank’s safeguard policies are also recognized as a reference standard for international best practice in the management of environmental and social risks associated with large investments. In this document, the principles of the safeguard policies of the World Bank Group are emphasized, rather than the details, because future users of the pipeline transport capacity will not necessarily be directly bound to the World Bank Group by agreements. It is also not appropriate for guidelines, laws and regulations of the Government of Chad to make explicit reference to internal policies of the World Bank Group

6. Neither the Loan Agreement, the EA, nor the EMP, define the “the Principles set for the in the EMP” (EMP Principles) referred to in Section 4.10 of the Loan Agreement mentioned above. For the purposes of this document, the EMP Principles requirement will be taken to mean compliance with those principles that were applied to the development of the Doba Oil Field, which reflect international best practice, as applicable to the petroleum sector, and are embodied in the specific measures and actions contained in the EMP.

7. This note outlines a set of guidelines to demonstrate compliance with the international best practice, and thus to the Chad Export Project EMP Principles. The full references to the Chad Export Project EMP and the 1999 EA package are provided in the reference list (Annex II). The guidelines are based on the principles of the Safeguard Policies of the World Bank Group (WBG), and are patterned on the Environmental and Social Policies of Esso<sup>7</sup>.

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Agreement, as such may be amended or supplemented from time to time in accordance with its provisions and the provisions of this Agreement.

<sup>6</sup> The full text is (Page 6 of the Loan Agreement, (aa)): “EMP” means the Environmental Management Plan which is that part of the EA consisting of: (i) the Environmental Assessment Executive Summary and Update; (ii) the Environmental Management Plan-Chad Portion; (iii) the Environmental Management Plan-Cameroon Portion; (iv) the Project Description and Decommissioning Portions of the Supporting Documents (Volume 1); Supporting Documents (Volumes 2, 3, 4, 5 and 6); and (v) the General Oil Spill Response Plan, which together describe the measures and actions that will be implemented by the Borrower, Chad and ESSO CHAD (on behalf of the Upstream Consortium) during the design, construction and operation of the Project to eliminate, mitigate, reduce or address identified biophysical, socio-economic, socio-cultural, health and other similar issues and their impact, to acceptable levels defined in the EA and to monitor the same, as such may be amended or supplemented from time to time in accordance with its provisions and the provisions of this Agreement and provided that, where there is any inconsistency between the terms of the EMP and the terms of this Agreement, the terms of this Agreement shall prevail;”

<sup>7</sup> 1999 EA Executive Summary, Chapter 4, §4.1

### THE EMP GUIDELINES

8. The overarching objectives of the EMP Guidelines are to: (i) eliminate potential biophysical, socioeconomic, and health impacts of oilfield developments or reduce them to acceptable levels, and (ii) ensure the compatibility of these developments with the balanced environmental and economic needs of the people of the Republic of Chad.
9. All new oilfield developments must be accompanied by:
- (i) An *Environmental Impact Assessment (EIA)* that identifies and evaluates adverse environmental or social impacts induced by the proposed development, including cumulative impacts.
  - (ii) An *Environmental Management Plan (EMP)* that indicates how the risks identified in the EIA will be mitigated.
  - (iii) A *Compensation and Resettlement Plan*<sup>8</sup> for physical resettlement of affected people and/or for temporary or permanent use or acquisition of affected peoples' lands and other assets, to be identified and addressed during the early phases of the EA process.
  - (iv) *Consultations*, to be carried out during the preparation of the EIA, the EMP and the Compensation and Resettlement Plan, and during construction and production.
  - (v) *Public disclosure* of all relevant documents in English and in French. Culturally appropriate forms of communication should be utilized where French is not understood.
10. The Government of Chad will define the legal and administrative processes to ensure that the above mentioned issues are addressed in accordance with international best practice, and will designate the authority<sup>9</sup> responsible for overseeing these processes.
11. The oilfield developer must ensure that the appropriate Chadian authority has delivered a certificate of environmental compliance confirming their satisfactory fulfillment of all requirements under the applicable Chadian laws and regulations before construction on the oilfield starts.
12. In addition to the above compliance certificate to be issued by authority responsible, and before agreeing to transport any oil in the Chad Transport System, TOTCO must have received from prospective shippers/developers an independent third party certification of compliance with the EMP guidelines outlined here above.
13. Shippers/developers shall deliver to TOTCO annually thereafter a certificate of compliance with their EMP issued by an independent third party.

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<sup>8</sup> The term "compensation and resettlement plan" is used here because those terms were used in the 1999 EA and EMP. Those terms are meant to convey both economic and physical displacement and encompass the meaning of involuntary resettlement as referenced in World Bank Group OD 4.30 and OD 4.12, Involuntary Resettlement.

<sup>9</sup> The designated authority is currently the Ministry of Environment and Water Resources.<sup>9</sup>

14. The independent third party<sup>10</sup> shall be contracted by the Government in a competitive bidding process. The cost of such independent third party work will be paid by the Government who will be reimbursed by the oil field developer.

### **Environmental Impact Assessment (EIA)**

15. The oilfield developer will prepare an EIA that is specific to the proposed development. The oil developer will agree with the appropriate Chadian authority on the extent of the EIA required, based on the type, sensitivity, and scale of the proposed development. For example, a minor add-on to an existing field might only require a complement to an existing EA. If an older EIA deemed to meet international best practice has previously been carried out for a similar project in the same area, then an update of the relevant topics may be considered sufficient.

16. The table below lists the biophysical, socioeconomic and health topics that an EIA might be required to cover, depending on the location and context of the proposed development of new oil fields:

<i><b>Biophysical</b></i>	<i><b>Socioeconomic</b></i>	<i><b>Health</b></i>
Air emissions, including dust	Migration to the project area and induced development	Respiratory diseases
Sewage/waste water discharge Solid and hazardous waste	Local and national business opportunities and revenues	Sexually transmitted diseases
Oil spill prevention and response	Employment and provisions for demobilization	Vector borne diseases and their control
Surface and ground water protection	Housing	Water borne diseases and their control
Surface and groundwater consumption	Land use, direct as well as induced development	Food borne diseases and their control
Loss of ground water recharge area	Sacred and cultural sites, including archaeological sites, graveyards and burials	Occupational exposure
River/Stream flow disruption	Semi sedentary and transhumant affected people and resources	Accidents and injuries
River/Stream bed and bank disruption	Fishery resources	Road safety
Soil protection and erosion control	Community disruption and conflict	Emergency response measures
Vegetation	Indigenous Peoples and other vulnerable groups	Use of herbicides for vegetation control need also to cover other pesticides for rodent, vermin, mosquito, etc. control.
Aquatic resources		
Natural habitats and biodiversity		

<sup>10</sup> The requirement for third party compliance assessments and certification will be in place for new developments submitted to the Chad Government for approval in the next 3 years. Thereafter, the requirement will be reconsidered in light of the anticipated continued growth in the capacity of the Chad authorities.

17. The EIA must include a description of the applicable legal and institutional framework, an evaluation of the design, and a comparison of design, technical and siting alternatives, including the "no action" alternative.

18. The EIA must demonstrate that development of the oilfield will not result in significant degradation or conversion<sup>11</sup> of nationally protected areas or internationally recognized sites for biodiversity. No significant degradation or conversion of other natural habitats will be permitted unless the EIA demonstrates through an analysis of alternatives that there are no other feasible options, that means to minimize loss of natural habitat have been taken into account, that benefits exceed the environmental costs, and that measures have been designed and committed to in the EMP by the oilfield developer to provide compensatory mitigation to offset the impacts of the loss.

19. The EIA must include measures to minimize and manage the use of pesticides for public health and vegetation control during construction and oil production. The use of biological and environmental pest management practices must be promoted. Any pesticide use must follow international standards with respect to selection, use, storage, transport and disposal.

20. The EIA must identify and assess public health and safety issues, including contagious diseases, HIV/AIDS and interactions between project workers and the local population.

21. The EIA must assess the risk that development of the oilfield will affect physical cultural resources (archaeological and paleontological sites, historical sites, sacred sites, graveyards and burials). Hence:

- The oil developer must conduct field based baseline survey to determine the presence of such resources. The analysis of alternatives in the EA must take into account ways to avoid or minimize impacts on identified physical cultural resources.
- The oil developer will consult local people in documenting the presence and significance of physical cultural resources.
- If "chance findings" that have not been identified in the baseline survey emerge during the construction phase, these will be evaluated by a specialist (archaeologist or anthropologist) and mitigation procedures and plans will be developed accordingly.

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<sup>11</sup> Significant conversion is the elimination or severe diminution of the integrity of a critical or other natural habitat caused by a major, long-term change in land or water use. Significant conversion may include, for example, land clearing; replacement of natural vegetation (e.g., by crops or tree plantations); permanent flooding (e.g., by a reservoir); drainage, dredging, filling, or channelization of wetlands; or surface mining. In both terrestrial and aquatic ecosystems, conversion of natural habitats can occur as the result of severe pollution. Conversion can result directly from the action of a project or through an indirect mechanism (e.g., through induced settlement along a road).

Degradation is modification of a critical or other natural habitat that substantially reduces the habitat's ability to maintain viable populations of its native species.

22. Although Indigenous Peoples were not pertinent to the Chad portion of the Chad Export Project EMP, they were addressed in the Cameroon portion and cannot be ruled out as possibly being subject to impacts in new oilfield development. Hence, oilfield developers must carry out studies to determine if Indigenous Peoples (such as those identified in Cameroon or other similar peoples) are affected. If so, consultations will need to be undertaken to solicit informed participation in designing a plan and implementing measures to ensure the Indigenous Peoples are not excluded from the project's benefits and to avoid adverse impacts on them or minimize, mitigate or compensate for such effects. It is important that mitigation actions be taken in a culturally appropriate manner consistent with the expressed views of the potentially affected Indigenous Peoples.

### **Environmental Management Plan**

23. The EMP will derive from the EIA findings and analysis, and will detail: (i) the measures to be taken by the developer during construction and production, to eliminate or avoid adverse environmental or social impacts identified in the EIA, or to reduce them to acceptable levels, (ii) the actions needed to implement these measures (iii) the agents or agencies responsible for those actions, and (iv) the anticipated costs and sources of funding.

24. The EMP might include the following tools<sup>12</sup>, depending on the nature of the proposed oil development.

- Change Management Plan;
- Community Health Outreach Program;
- Decommissioning Plan;
- Environment Alignment Sheets;
- Environmental Monitoring Plan;
- Health Plan;
- Management Plan for Physical Cultural Resources (including chance find procedures);
- Spill Response Plan;
- Public Safety and Awareness Plan;
- Socioeconomic Plan;
- Soil Erosion Mitigation Plan;
- Waste Management Plan; and
- Induced Access Management Plan.

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<sup>12</sup> The listed tools were developed for the implementation of the Chad Export Project EMP (Chad Portion of the EMP for the Chad Export Project, Volume 1, p 3.2 & 7.1)

### Compensation and Resettlement Plan

25. The oilfield developer must draft a Compensation and Resettlement Plan, as necessary, and incorporate it into the EMP.
26. The essential goals of the Compensation and Resettlement Plan are that:
- (a) displaced persons [both physically and economically displaced] improve or at least restore their livelihoods and standards of living in real terms relative to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher,
  - (b) Compensation is perceived as fair by the local population<sup>13</sup>.
27. To accomplish these goals:
- (a) The project design should assess all feasible alternatives to avoid or minimize the need for physical resettlement or other compensation.
  - (b) The potential economic and social impacts that are caused by physical and economic displacement (including relocation or loss of shelter, loss of assets or access to assets, loss of income sources or other means of livelihood, loss of assets or access to assets, loss of income sources or means of livelihood, whether or not the affected person must move to another location), are to be identified and addressed during the early phases of project preparation and the EIA process through appropriate census and socio-economic surveys of the affected population.
  - (c) The oilfield developer will consult with project-affected persons, local communities and local NGOs. When possible and to the extent practicable local communities and/or their identified advisors, should be provided with the opportunity to help plan, implement and monitor the compensation and resettlement plan. Attention should be provided to the needs of vulnerable groups among those displaced.
  - (d) The oilfield developer will inform displaced persons of their rights, consult them on options, and provide them with technically and economically feasible resettlement and compensation alternatives and needed assistance, including assistance during relocation and transitional support and assistance where appropriate.
  - (e) Compensation and/or physical resettlement of affected people will be applicable to temporary or permanent use or acquisition of lands.
  - (f) Compensation for land and loss of assets attributable to the project will be at full replacement cost.
  - (g) Land-based resettlement will be preferred for displaced persons who are land-based.
  - (h) For those without formal legal rights to lands or claims to such land that could be recognized under the laws of the country, resettlement assistance will be provided to help improve or at least restore their livelihoods.

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<sup>13</sup> Chad Export Project EMP, Chad Portion, Vol. 3; p. 1.9, table 1.1

28. In summary, prior to displacement or loss of access to assets, compensation and/or resettlement will be provided for all lost assets or access to assets such that, at a minimum, restoration of former living standards, income earning capacity and production levels can be attained.

29. The oilfield developer will establish and publicize transparent, clear and easily accessible mechanisms for receiving and addressing: grievances related to physical resettlement and/or compensation procedures. The developer will document all grievances and the responses provided to claimants.

30. Disclosure of compensation and resettlement plans is discussed in paragraph 30.

### **Consultations**

31. Consultations with project-affected persons, project-affected communities and local nongovernmental organizations concerning the proposed oilfield development are essential to promote a proper understanding of the nature and extent of any social and environmental impacts that may result from the development, and to seek inputs from those communities in the development and implementation of appropriate mitigation measures. Furthermore, consultation programs aim to reconcile misconceptions about the project and its impacts and mitigation.

32. Consultation is a continuous process that starts out early in the EIA process so that appropriate adjustments in project design can be made, according to an adaptive process. Stakeholders and partners are required to be given the opportunity to comment on and review the draft EIA, EMP, and Compensation and Resettlement Plan.

33. Consultation will: (i) be timely, open, and not restricted; (ii) will include affected people, local NGOs and other stakeholders, (iii) will take place at least twice, initially on the scope of the EIA, and subsequently on the draft EIA, EMP and Compensation and Resettlement Plan. The draft EIA will identify the locations and dates of consultations held, with whom and how comments and recommendations have been taken into account. The final EIA will provide similar information about consultations on the draft EIA.

### **Public Disclosure**

34. The oil developer must publicly disclose at the national and local levels the environmental documentation for the proposed development, including the EIA, EMP and the Compensation and Resettlement Plan, to ensure transparency and accountability, and to ensure meaningful consultations. More broadly, the oil developer should communicate with the public on environmental matters and share experiences with both the government and industry groups<sup>14</sup>. The EIA, EMP and the Compensation and Resettlement Plan will be disclosed to affected populations and local NGOs, prior to and after their finalization, as well as in appropriate public places and locations, in libraries and other places of public access in N'djamena and placed on relevant channels, such as websites. Information accompanying the disclosed documents will specify how comments can be made and to whom. The documents will be disclosed for a minimum

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<sup>14</sup> 1999 EA Executive Summary, Chapter 4 p 1

period of 45 days, to afford the opportunity for public comment. The final EIA, EMP and Compensation and Resettlement Plan will be revised based upon or otherwise respond to the comments received.

### **MONITORING OF COMPLIANCE**

35. The oilfield developer must agree with the relevant Chadian authority on procedures to monitor compliance with the EMP, the EMP tools, and the Compensation and Resettlement Plan, during construction and production. These procedures must include: (i) the provision of sufficient information by the developer to allow the authority to verify compliance, (ii) a reporting mechanism to local authorities, (iii) regular revisions as new issues arise and/or whenever the initial EMP procedures are found to be inadequate, unrealistic or not adapted to the field reality, (iv) an independent external environmental audit.

### **TECHNICAL GUIDELINES**

36. The oilfield developer must also follow the technical guidelines used for the Chad Export Project<sup>15</sup>. These technical guidelines are attached as Annex I. They cover:

- (a) Ambient Air quality: limits for onshore project facilities;
- (b) Air quality: stack emission for onshore project facilities;
- (c) Water quality;
- (d) Use of Chromate in Power Plant Water Treatment Process;
- (e) Ambient Noise for Onshore Project Facilities;
- (f) Emissions Monitoring for Onshore Project Facilities;
- (g) Transportation System Easement Maintenance During the Operations Phase;
- (h) Chad Oil Field Area Groundwater Baseline Information.

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<sup>15</sup> Loan Agreement N° 4558, Schedule 7 and Loan Agreement N° IFC Loan Number; Schedule 17.

**Annex I**  
**Environmental Guidelines**  
**Extract from the Loan Agreement N° 4558 Schedule 7- Loan Agreement**  
**N° 11124 and 11125 Schedule 17**

**Section 1. Ambient Air quality - Limits for Onshore Project Facilities**

Maximum concentrations of contaminants, measured outside the property boundary of Project facilities as defined for the land easement (NO<sub>x</sub> to be measured in the Project air shed as defined in the air quality model set forth in the “Dames and Moore, 1999b, Air Quality Technical Analysis, 1999 Update, Chad Export Project, May 1999”, included by reference in the EMP, Supporting Documents, Volume 1, Lists of Studies/Reports (the “Air Quality Study”)), inclusive of background ambient air quality levels, are as follows:

<i>Contaminant</i>	<i>Ambient Air Quality</i>
Particulate Matter (< 10 µm)	
Annual Arithmetic Mean	50 µg/m <sup>3</sup>
Maximum 24-hour Average	150 µg/m <sup>3</sup>
Sulfur Dioxide	
Annual Arithmetic Mean	80 µg/m <sup>3</sup>
Maximum 24-hour Average	150 µg/m <sup>3</sup>
Nitrogen Oxides, as NO <sub>2</sub>	
Annual Arithmetic Mean	100 µg/m <sup>3</sup>
Maximum 24-hour Average	150 µg/m <sup>3</sup>

A measured exceedance of the above limits caused by: (i) natural sources; or (ii) to the extent unrelated to the Project and/or the Oilfield Development, industrial development or the burning of materials outside Project property limits by third parties (excluding, for the avoidance of doubt, any contractors or service providers of COTCO, TOTCO and/or any member of the Upstream Consortium), in each case where such emissions have not already been taken into account in determining the background ambient air quality levels referred to above, shall not be considered a non-compliance with those limits, provided that COTCO, TOTCO and/or any member of the Upstream Consortium (as applicable) shall have provided evidence satisfactory to the Bank (acting reasonably) that the contaminants causing the relevant exceedance were caused as aforesaid. The exception to this is the measured exceedance for NO<sub>x</sub> for the Oilfield Development portion of the Project. Any measured exceedance of the NO<sub>x</sub> limits, irrespective of the source, shall be considered a non-compliance with those limits.

## Section 2. Air Quality - Stack Emission Limits for Onshore Project Facilities

The following stack emission limits apply to permanent major individual onshore Project facility sources under normal, steady state operating conditions, exclusive of startup/shutdown and emergency/upset conditions. Concentrations of contaminants should not be diluted. A major source is defined as a continuously operating, onshore single unit of the following types: combustion turbine, reciprocating engine, fired heater, boiler, or waste incinerator. Specifically excluded are intermittent sources such as engines driving emergency generators and fire pumps.

### Section 2.1

Maximum concentrations of contaminants from fired heaters, boilers and waste incinerators located in the oil field facilities area, the pump stations or the pressure reducing station are as follows:

<i>Contaminant</i>	<i>Emission Limit<sup>1</sup></i>
Particulate Matter	100 mg/Nm <sup>3</sup>
Nitrogen Oxides, as NO <sub>2</sub>	460 mg/Nm <sup>3</sup> for liquid fossil fuel 320 mg/Nm <sup>3</sup> for gaseous fossil fuel
Sulphur Dioxide	1,000 mg/Nm <sup>3</sup>
Volatile Organic Compounds	20 mg/Nm <sup>3</sup>
Odor	Not offensive at the receptor end (H <sub>2</sub> S at the property boundary should be less than 5 µg/m <sup>3</sup> )
Hydrogen Sulfide	30 mg/m <sup>3</sup>

### Section 2.2

Maximum concentrations of contaminants from the power plant combustion turbines in Chad are as follows. Concentrations should not be diluted:

<i>Contaminant</i>	<i>Emission Limit<sup>1</sup></i>
Particulate Matter	50 mg/Nm <sup>3</sup>
Sulfur Dioxide	0.20 metric tons per day per megawatt of electricity, and 2,000 mg/Nm <sup>3</sup>

<sup>1</sup> mg/Nm<sup>3</sup> refers to milligrams per cubic meter at 0° C and pressure of 1013 millibars under dry conditions at 15% oxygen.  
NO<sub>2</sub> refers to nitrogen dioxide.  
NO<sub>2</sub> limit of 250 mg/Nm<sup>3</sup> for combustion turbines is based on application of low NO<sub>x</sub> burner technology.

**Section 2.3**

Maximum concentrations of contaminants from combustion turbines (other than the power plant combustion turbines in Chad) and reciprocating engines, both with an equivalent electricity output of smaller than 50 MW are as follows. Concentrations should not be diluted:

<i>Contaminant</i>	<i>Emission Limit<sup>1</sup></i>
Particulate Matter	100 mg/Nm <sup>3</sup>
Nitrogen Oxides, as NO <sub>2</sub>	
For Combustion Turbines	250 mg/Nm <sup>3</sup>
For Reciprocating Engines	2,300 mg/Nm <sup>3</sup>
Sulfur Dioxide	2,000 mg/Nm <sup>3</sup>

**Section 2.4**

The particulate matter emission limit of 100 mg/Nm<sup>3</sup> in Section 2.3 of this Schedule for combustion turbines (other than the power plant combustion turbines in Chad) and reciprocating engines, with a heat input less than or equal to 10 million British thermal units per hour, may be increased to 150 mg/Nm<sup>3</sup> provided the Bank will have received evidence from COTCO and TOTCO justifying the increase. COTCO and TOTCO will provide this evidence in a report that shall be reviewed by the Bank, which agreement to such increases shall not be unreasonably withheld.

**Section 3. Water Quality****Section 3.1**

Liquid effluents directly discharged from onshore Project facilities to surface waters will comply with the following discharge limits:

<i>Parameter</i>	<i>Liquid Effluent Limit<sup>2</sup></i>
PH	6 to 9
Biological Oxygen Demand (BOD <sub>5</sub> )	50 mg/L
Chemical Oxygen Demand (COD)	250 mg/L
Oil and Grease	20 mg/L
Heavy Metals, Total	5 mg/L
Phenol	1 mg/L
Phenolic Compounds	100 mg/L
Sulfide	1 mg/L
Total Suspended Solids	50 mg/L
Cadmium	0.7 mg/L
Mercury	0.1 mg/L
Coliforms	Less than 400 MPN/100 mL (MPN – Most Probable Number)
Total Residual Chlorine	0.5 mg/L
Temperature - at the edge of a designated mixing zone	Maximum 5 °C above ambient temperature of receiving waters Maximum 3°C if receiving waters >28°C

### Section 3.2

Liquid effluents directly discharged from the FSO (Floating Storage and Offloading vessel) to surface waters will comply with applicable MARPOL 73/78 (International Convention for the Prevention of Pollution from Ships) Regulations or the following discharge limits, whichever is more restrictive:

<i>Parameter</i>	<i>Liquid Effluent Limit<sup>2</sup></i>
PH	6 to 9
Oil and Grease	20 mg/l
Heavy Metals, Total	5 mg/L
Phenolic Compounds Maximum total concentration	100 mg/L
Cadmium	0.7 mg/L
Mercury	0.1 mg/L
Maximum Sanitary Waste Residual Chlorine	0.5 mg/L

<sup>2</sup> mg/L refers to milligrams per liter.  
mL refers to milliliters.

Heavy Metals Total consists of antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, vanadium, and zinc.

**Section 4. Use of Chromate in Power Plant Water Treatment Process**

Formulations containing chromates will not be used in water treatment processes associated with turbines and reciprocating engines.

**Section 5. Ambient Noise for Onshore Project Facilities**

The steady state ambient noise design criteria for onshore Project facilities during the operations phase is 70 dBA (A-weighted decibels) measured at the property boundary of Project facilities as defined for the land easement.

**Section 7. Transportation System Easement Maintenance - Operations Phase**

The information in this section provides clarification to the Chad Portion and Cameroon Portion, Volume 1, Chapter 2, of the EMP and the Project Description (Supporting Documents, Volume 1).

The permanently maintained system easement for the pipeline will be 10 to 15 meters wide. The land within the easement will be returned to its former agricultural or other use provided such use is compatible with the operations and maintenance requirements of the Transportation System. For example, locating structures or the planting of trees will not be allowed within the confines of the system easement. Hand or mechanical cutting will be used as necessary to control vegetation that limits aerial observation of the easement (e.g., overhanging tree branches, brush over 1 to 2 meters high). Shrubs and tree saplings that take root on the easement will also be cut. The use of herbicides to control vegetation within the pipeline system easement is not planned. However, should it be necessary to utilize herbicides for vegetation management at certain locations along the system easement, any herbicide that would be used would be thoroughly evaluated before its use, would meet local regulations, and be in line with international guidelines.

The Transportation System easement will be inspected at least once per month by aerial patrol for signs of leakage or inappropriate activities such as the construction of structures, inappropriate agricultural practices, or unauthorized encroachment. Items that require additional attention such as soil erosion, watercourse changes, weathered pipeline markers, road and stream crossings, and growth of brush and trees will also be identified during the aerial patrols. Line walking will be used as necessary to supplement the aerial patrols and to further investigate potential problems identified during the aerial inspections. Vehicular use on the system easement for inspection purposes would be confined to specific locations such as at mainline valve stations and telecommunication sites - these facilities are typically near existing roads or trails. As is mentioned in the EMP-Cameroon Portion (Volume 1), natural barriers will be reinstated along the easement during construction to inhibit vehicular movement.

Regarding pedestrian and cattle access to the Transportation System easement, the primary mitigation measures are described in the Induced Access Management Plan contained in the EMP-Cameroon Portion (Volume 1, Appendix D) and the EMP-Chad Portion and Cameroon Portion, Volume 1, Chapter 2, Socio-economic Topic No. 8 (Semi-Sedentary and Transhumant Cattle Movements). The Induced Access Management Plan lists measures designed to reduce or preclude vehicular access to the

pipeline easement, and consequently the implementation of these measures will also serve to inhibit increased pedestrian movements in locations where induced access was determined to be important. Based on analyses undertaken by environmental and socioeconomic consultants, it is not practicable to prevent pedestrians and cattle from using the easement.

### **Section 8. Chad Oil Field Area Groundwater Baseline Information**

The information in this section provides clarification to the Chad Environmental Management Plan (EMP-Chad Portion, Volume 1, Chapter 2, Biophysical Topic No. 4), which specifies the institution of a regional groundwater monitoring program in the immediate vicinities of the three oil fields. This monitoring program will include water quality and level parameters from Project drilled wells and/or existing village wells. The program will be designed during the detail design phase of the Project and implemented prior to starting major civil work in the field.

**Annex II**  
**Definitions**  
**(extracted from the Loan Agreement N° 4558,**  
**Article 1 definitions and Schedule 6)**

**Chad Export Project EMP** means the Environmental Management Plan which is that part of the EA consisting of: (i) the Environmental Assessment Executive Summary and Update; (ii) the Environmental Management Plan-Chad Portion; (iii) the Environmental Management Plan-Cameroon Portion; (iv) the Project Description and Decommissioning Portions of the Supporting Documents (Volume 1); Supporting Documents (Volumes 2, 3, 4, 5 and 6); and (v) the General Oil Spill Response Plan.

**1999 EA** means the environmental assessment documentation for the Project, consisting of all the documents referred to in Schedule 6 of the Loan Agreement:

**A. Environmental Assessment Executive Summary and Update** (dated May 1999)

**B. Environmental Management Plan - Chad Portion** (dated May 1999)

**Volume 1**

- Base Document
- Management Plan for Cultural Properties
- Handbook for Site-Specific Environmental Mitigation Actions
- Environmental Monitoring Plan

**Volume 2**

- Biophysical/Socioeconomic/Health technical Requirements and Specifications

**Volume 3**

- Compensation & Resettlement Plan

**Volume 4**

- Regional Development Plan: Near Term Measures
- Revenue Management Plan
- Institutional Capacity Building

**Volume 5**

- Waste Management Plan

**Volume 6**

- Environmental Line List
- Environmental Alignment Sheets

**C. Environmental Management Plan-Cameroon Portion** (dated May 1999)

**Volume 1**

- Base Document
- Induced Access Management Plan
- Management Plan for Cultural Properties
- Handbook for Site-Specific Environmental Mitigation Actions
- Environmental Monitoring Plan

**Volume 2**

- Biophysical/Socioeconomic/Health Technical Requirements and Specifications

**Volume 3**

- Compensation Plan

**Volume 4**

- Environmental Foundation Plan
- Off-site Environmental Enhancement Plan
- Indigenous Peoples Plan

**Volume 5**

- Waste Management Plan

**Volume 6**

- Environmental Line List
- Environmental Alignment Sheets

**D. Supporting Documents** (dated May 1999)**Volume 1**

- Project Description
- Decommissioning
- Lists of Studies/Reports
- Lists of Consultant/Experts

**Volume 2**

- Alternatives Analysis

**Volume 3**

- Consultation and Public Review Program

**Volume 4**

- Oil Spill Response: Preliminary Approach

**Volume 5**

- Chad Biological Studies
- Cameroon Biological Studies

**Volume 6**

- Chad Public Health
- Cameroon Public Health

**E. General Oil Spill Response Plan** (dated September 1999)

<b>Annex III References</b>
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1. **Loan Agreement N° 4558:** (Petroleum development and Pipeline Project) between the Republic of Chad and the International Bank for Reconstruction and Development; March 29 2001

[http://www.worldbank.org/afr/ccproj/project/td\\_la\\_en.pdf](http://www.worldbank.org/afr/ccproj/project/td_la_en.pdf)

2. Loan Agreement N° 4558 IFC loan reference

3. **Loi N° 014/PR/98** définissant les principes généraux de la protection de l'environnement, 17 août 1998

Other useful web sites

4. Operational **Policy OP 4.12:** Involuntary Resettlement. 2, December 2001 and revised in April 2004.

(<http://lnweb18.worldbank.org/ESSD/sdvext.nsf/52ByDocName/SafeguardPolicies>)

5. **Pollution Prevention Abatement Handbook 1998:** World Bank Group publication

[http://www-wds.worldbank.org/servlet/WDS\\_IBank\\_Servlet?pcont=details&eid=000094946\\_99040905052283](http://www-wds.worldbank.org/servlet/WDS_IBank_Servlet?pcont=details&eid=000094946_99040905052283)

<http://www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuidelines>

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6. Best Practices in dealing with the social impacts of Oil and Gas Operation: Environmental and Social Impact Mitigation Practices.

<http://www.worldbank.org/ogsimpact/esimoverview.htm>

7. World Bank Group Environmental and Social Safeguard Policies – all policies are available in French:

<http://lnweb18.worldbank.org/ESSD/sdvext.nsf/52ByDocName/SafeguardPolicies>

8. Information on the Chad Export Project:

<http://cnpp-tchad.org>

<http://www.worldbank.org/afr/ccproj/>

[http://www2.exxonmobil.com/Chad/Chad\\_HomePage.asp](http://www2.exxonmobil.com/Chad/Chad_HomePage.asp)

**List of acronyms:**

CTNSC	Comité Technique National de Surveillance et de Contrôle
EA	Environmental Assessment
EMP	Environmental Management Plan
IBRD	International Bank for Reconstruction and Development
IFC	International Finance Corporation