**Reduction and phase-out of PFOS in priority sectors in China**

**Terms of Reference (TOR) for CS-16**

**Study on PFOS/PFOSF containing waste management and disposal in China**

**1. Background**

In May 2009, the fourth meeting of Conference of the Parties to *the* *Stockholm Convention on Persistent Organic Pollutants (POPs)* (hereinafter referred to as *the Convention*) has passed an Amendment, which added 9 new POPs, including perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride (PFOS/PFOSF), into the Convention. PFOS and PFOSF were listed in Annex B and the Convention detailed 12 "specific exemptions" and 8 "acceptable uses". On August 30, 2013, the NPC Standing Committee approved this amendment, which officially took effect in China on March 26, 2014.

It is once reported that China was the world's only country, which produces PFOSF (raw materials for the synthesis of PFOS). The annual PFOSF production in China was widely used in firefighting, electronics, metal plating, pesticides, oil drilling and other industries and fields. PFOS production and use involves a wide range of industries, diversified products, which puts the compliance of obligation of Convention in very difficult situation. On March 11, 2019, the Ministry of Ecological Environment and other eleven ministries jointly issued a bulletin (bulletin No. 10, 2019). Since March 26, 2019, PFOS could only be used in 7 acceptable purposes including firefighting and metal-plating in closed-loop.

To implement the amendment requirements, and to promote PFOS reduction and phase-out in China, Foreign Environmental Cooperation Center of Ministry of Environment and Ecology (FECO) cooperated with the World Bank (WB) developed the *Reduction and phase-out of PFOS in priority sectors in China* project (hereinafter referred to as *the PFOS Project*). The PFOS project is aimed to help China fulfill the Convention’s obligation of reduction and phase-out of PFOS.

The production and use of PFOSF/PFOS products definitely might generate waste. Some PFOS related chemicals have been included in ‘List of hazardous chemicals for key environmental management’[[1]](#footnote-1).However, PFOS/PFOSF containing waste has not included in the ‘National List of Hazardous Wastes’, also it’s absent in the ‘Identification standard for hazardous wastes - identification for toxic substance content’ (GB 5085.6-2007). The current situation hinders the environmental sound of PFOS/PFOSF containing waste.

This TOR is for hiring a consulting firm to study on PFOS/PFOSF containing waste management and disposal in China and abroad, to propose the suggestions or technical routines about Chinese standards and regulations on PFOS/PFOSF waste identification and disposal.

**2. Objectives**

The objectives of this assignment include:

* The international practice of PFOS/PFOSF containing waste management
* Identification methods and disposal technical routines based on the status of PFOS/PFOSF containing waste in China
* Regulatory suggestions on PFOS/PFOSF containing waste management in China in align with hazardous waste management system in China

**3. Task assignments**

To achieve the above objectives, the consulting firm is required to carry out the following tasks:

**3.1**  **The international practice of PFOS/PFOSF containing waste management**

(1) The international status on regulations and technical standards of PFOS/PFOSF containing waste management and disposal

Desktop study on the international regulatory and technical guidance and standards on PFOS/PFOSF containing wastes management, including the definition of PFOS/PFOSF containing wastes, the relevant concentration limit, identification, sampling, analysis, handling, packaging, transportation and disposal requirement. The regions and countries should include but not limited to US, EU and EU member states as Germany, Belgium, Japan.

(2) The international practice on classification and identification methods of PFOS/PFOSF containing waste and case study

This study shall focus in actual practice in the classification in PFOS/PFOSF production facilities and application facilities and relevant end waste formats, and operational identification procedure and corresponding the cases for PFOS/PFOSF containing waste identification. The regions and countries cover but not limited to US, EU and EU member states as Germany, Belgium, Japan.

(3) The international status on Disposal technologies PFOS/PFOSF containing waste and case study

Collect existing technical guidance for the disposal of PFOS/PFOSF containing waste, should include but not limited to a) Australia: “Options for disposal of perfluorooctane sulfonate (PFOS) waste”[[2]](#footnote-2);b)Japan: “Guideline on the Treatment of Wastes Containing Perfluorooctane Sulfonic Acid (PFOS), and Its Salts in Japan”[[3]](#footnote-3);c) New Zealand: “Companion guide on managing fire-fighting foams with PFAS, including PFOS and PFOA”[[4]](#footnote-4);d) UK: ‘Guidance - dispose of waste containing persistent organic pollutants (POPs)’ issued by Environment Agency of UK[[5]](#footnote-5).

This study should focus on commercialized disposal technologies of PFOS/PFOSF containing waste and relevant case study, including but not limited to High Temperature Incineration, High Temperature Plasma destruction and co-destruction by cement kiln.

**3.2 Suggestions on identification methods and disposal technical routines based on the status of PFOS/PFOSF** **containing waste in China**

(1) Develop the identification guidance for PFOS/PFOSF containing waste

Develop the identification guidance for PFOS/PFOSF containing waste, the essential elements including but not limited to, a) the classification of PFOS/PFOSF containing waste in China, b) the operational procedure for identification of PFOS/PFOSF containing waste, the c) determination method for PFOS/PFOSF content in the waste, referring to the existing standard sampling and analytical methods.

(2) Propose the disposal technology solution based the typical PFOS/PFOSF containing waste in China

Identify and characterize the main PFOS waste streams, including from organic fluorine industry, chrome plating industry, firefighting industry, pest control, oil industry etc.

For each waste stream, propose options for disposal, including any waste pretreatment and options for final disposal.

Identify feasibility, challenges, pros and cons of the various options, taking into account multi-pollutant control and trade-offs and applicability to other chemicals and sustainability of the various options.

Make recommendations for pilots or investment needed, as may be needed.

Organize the expert workshop to request comments and suggestions. According to the feedbacks collected, finalize the proposal.

**3.3 Regulatory suggestions on PFOS/PFOSF containing waste management in China in align with hazardous waste management system in China**

(1) Propose the limit for PFOS/PFOSF content in the waste

(2) Propose the suggestions on how to include PFOS/PFOSF containing waste into current the hazardous waste management system

Feasibility study on including PFOS/PFOSF containing waste into the ‘National List of Hazardous Wastes’ and revising Identification standard for hazardous wastes - identification for toxic substance content’ (GB 5085.6-2007) by including the PFOS/PFOSF containing waste into the standard.

(3) Organize the expert workshop to request comments and suggestions. According to the feedbacks collected, finalize the proposal.

**3.4Others**

(1) Participate in the workshops and trainings organized by FECO or local PMO under this project.

(2) Attend the routine meetings organized by FECO or local PMO under this project, and present the progress as required by the organizer.

**4. Outputs**

The outputs of this assignment including the following both in Chinese and in English:

1. Report on International practice of PFOS/PFOSF containing waste management.
2. Identification guidance for PFOS/PFOSF containing waste.
3. Report on disposal technical routines based on the status of PFOS/PFOSF containing waste in China.
4. Regulatory suggestions on PFOS/PFOSF containing waste management in China.

**5. Schedule**

The duration of this assignment is September 2020 - December 2021.

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| --- | --- | --- |
| **No.** | **outputs** | **Estimated time of outputs** |
| 1 | Report on International practice of PFOS/PFOSF containing waste management | 2 months after contract signed |
| 2 | Identification guidance for PFOS/PFOSF containing waste | No more than 7 months after contract signed |
| 3 |  Report on disposal technical routines based on the status of PFOS/PFOSF containing waste in China | No more than 10months after contract signed |
| 4 | Regulatory suggestions on PFOS/PFOSF containing waste management in China  | No more than 12 months after contract signed |

**6. Qualification**

1. **The candidate consulting firm/University/Academy/Institute should, as a minimum, have the following qualifications:**
2. At least 10 years’ experience in the hazardous waste management, disposal technology evaluation or hazardous waste identification .
3. Project experience in formulation or revision of environmental standards or hazardous waste identification.
4. More than 5 years of fluorinated-chemical industry related consultation is preferred.
5. **The team leader must meet the following qualifications:**
6. With professional title at least Senior engineer/ Associate professor/Associate researcher
7. More than 8 years working experience of chemical management or hazardous waste identification and disposal.
8. At least 3 projects relevant to the hazardous waste management, disposal technology evaluation are preferred, and the working experience of the development of environmental standard is favoured.
9. **Other Participants must meet the following qualifactions:**
10. Intermediate professional title or with master degree.
11. More than 3 years working experience in chemical management or hazardous waste identification and disposal.

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| --- | --- | --- | --- |
| **Personal** | **Number of people** | **Months per person** | **Total months per kind of expert** |
| Team leader | 1 | 2 | 2 |
| Other Participants | 2 | 5 | 10 |
| Total months | 12 |

1. <http://www.zhb.gov.cn/gkml/hbb/bgt/201404/t20140409_270296.htm> [↑](#footnote-ref-1)
2. <https://www.nicnas.gov.au/__data/assets/pdf_file/0005/44087/PFOS-disposal.pdf> [↑](#footnote-ref-2)
3. <http://www.env.go.jp/en/focus/docs/files/201304-89.pdf> [↑](#footnote-ref-3)
4. <https://epa.govt.nz/news-and-alerts/alerts/managing-fire-fighting-foams-manufactured-with-pfas-chemicals/> [↑](#footnote-ref-4)
5. <https://www.gov.uk/guidance/dispose-of-waste-containing-persistent-organic-pollutants-pops> [↑](#footnote-ref-5)