Terms of Reference on SOP development for Incinerator (use in Thimphu, Gelephu and Phuentsholing)

Background

Biomedical and hazardous waste continues to pose the most complex, technical, regulatory and administrative challenges to Bhutan's efforts in safe management of waste. While waste segregation is practiced in most health care facilities through color coded segregation system, biomedical waste from healthcare facilities are either autoclaved or buried in deep pits and dumped along with the municipal waste in landfill in most districts without any pretreatment posing significant threats to human health, wildlife and the environment. In addition, unsafe disposal and destruction of obsolete pesticides, herbicides, fertilizers and other toxic and hazardous waste release toxic pollutants which causes adverse environmental and intergenerational health impacts through the contamination of farmlands, water sources and air pollution.

With the first COVID 19 case detected in March 2020, 868 positive cases have been confirmed until date. A daily waste of 500 kg is collected from healthcare and quarantine facilities. Bhutan lacks engineered landfill for proper disposal of municipal and other types of biomedical and hazardous waste. Even after disinfection by autoclave, the healthcare waste is disposed of in open dumpsites, allowing the waste pickers to recover and recycle medical products, and animals to scavenge, exposing them to greater risks. Understanding the current technical, logistical and financial limitations listed above, that are barriers for the deployment of a large scale autoclaves, the Government of Bhutan decided to deploy incineration technologies to tackle immediate problems arising from the increased healthcare wastes generated as direct result of the COVID-19 pandemic.

The most reliable and commonly used incineration-based treatment process for health-care waste is pyrolytic incineration, also called controlled air incineration or double-chamber incineration. The pyrolytic incinerator comprises a pyrolytic chamber and a post-combustion chamber. Optimal combustion conditions are essential if there is to be almost complete destruction of wastes without the generation of significant amounts of harmful solid, liquid, or gaseous outputs (e.g. dioxins, furans). The burning temperature, waste residence time inside the furnace, gas turbulence, and size of airflow inputs are therefore critical.

The objective of this assignment is to develop a SOP on segregation, safe handling and disposal of biomedical and hazardous waste through the operation of the Incinerators in the identified districts of Thimphu, Phuentsholing , Gelephu

Scope of Work

The consultant should develop SOP clearly outlining the following details

1. Present a clear flow chart of biomedical and hazardous waste from source, segregation, incineration, and disposal of residual waste

2. Present detailed SOP from segregation, collection, transport, incineration, operation and management (steps involved and role of different stakeholders)

2.a SOP for the waste management processes in Waste Segregation, collection and transport SOP:

- SOPs at waste generation site including collection, storage and transport of biomedical and hazardous wastes.
- To list and Characterization of waste suitable for incineration (biomedical wastes, pesticides and other types of waste including hazardous waste generated from different sources) and waste characteristics not suitable for incineration which will not be accepted at the facility.
- Occupational Health and Safety measures as well as environmental safeguard for waste handling during segregation, collection and transport.
- Material Safety Data Sheet/ Safety Data Sheet (MSDS/SDS) format to be attached to all consignments of wastes and format of data sheet logging at different stages of waste handling.
- Training to hospital staff on how to segregate the medical waste from normal waste.
- Training manual for waste handlers at the generation site and transport.

2.b Incineration SOP

- The SOP at the incineration facility should cover aspects of waste receipt, temporary storage and operation of the incinerator, including pre-operation checks on the incinerator as specified by the manufacturer.
- Format for MSDS/SDS logging at the incineration facility including both at waste receipt and waste incineration phases.
- Training manual on the operation of the incinerator based on the user guideline/ operation manual of the manufacturer.

2.c SOPs on Monitoring of priority emissions from incineration (PM 10, SO_2, NO_x and CO_2).

- SOPs on Treatment and disposal of residual ash from incineration
- Stakeholder identification, Capacity building/ enhancement requirements
- Register of regulatory and statutory requirements including national emission and discharge standards and OHS Requirements. Format of self-compliance reports against the Register.

2.d HR Operation and maintenance cost estimation

- Manpower requirement for operation and maintenance
- Running costs covering costs of fuel, electricity, salary of staff, maintenance costs of vehicle including source of budget from the RGOB

3. Capacity building and sensitization workshop identified including field demonstration of identified stakeholders

Timeline and deliverable

Activity	Timeline	No of days
Desk/literature review and 0 draft with out line of SOP and consultation	3rd week April	5
1st draft report SOP , consultation and feedback incorporation	5th week April	12
2nd draft submission followed by feedback incorporation	2nd week April	5
Training &sensitization of key stakeholders and report submission	3rd week May	5
Final draft submission and acceptance by UNDP and NEC	4th week May	3

Payment modality

Payment	Deliverables
NA	0% draft submission with outline of SOP
1st payment- 20%	1st Draft submission
2nd payment- 30%	2nd draft submission and training completion/ report submission
3rd payment- 50%	Final draft submission and on acceptance by UNDP and NEC/MOH

Working arrangement

The consultant will work under the supervision of UNDP Portfolio manager and in close consultation with the NEC flagship team lead and focal person from the Ministry of Health

Duration and station

Total 30 person days spread over the month mid April- end May 2021 will be assigned to the national expert. Homebased and other locations (in-country) based on stakeholder consultation process

Qualification

- Master's Degree or equivalent Advanced Degree in Waste Management, environment management, Natural resource management, environmental science or related fields.

Experience:

- A minimum of five years of work experience related to waste management and environmental protection.
- Demonstrated experience developing training manuals and SOPs. High preferences shall be for experiences related to biomedical and hazardous incinerators.
- A good track record of operating the incinerators.
- Strong communication, written and presentation skills

Language Requirements:

- Fluency in English