

## Appendix B: Environmental management plan for operation of the STERILWAVE apparatus at Lady Pohamba Private Hospital, Windhoek.

Potential negative impacts from operation of the STERILWAVE apparatus can be fully mitigated, with implementation of the following monitoring and mitigation measures.

### 1. Monitoring for adequate disinfection of pathogens

The specifications of the STERILWAVE apparatus state that it achieves microbial inactivation over 8log10, and provides proof from research in its country of origin, France. Additionally, recent proof from authorities in China and France, in response to the Covid 19 pandemic, has shown complete disinfection of viral pathogens. Therefore there is no risk of contagious spread from the Sterilwave waste. Nevertheless, precaution advises that the output material should still be subjected to microbiological tests to verify the level of disinfection achieved under the specific circumstances at the hospital. A biological indicator kit can be acquired to check the sterilisation efficiency of the apparatus.

*Action: Undertake regular microbiological tests of the output material. This should be done through an independent monitoring agency or the official authorities.*

*Verification: Annual certificate of safety issued by MoHSS.*

### 2. Emission of gases

The STERILWAVE apparatus will give off gaseous exhaust. The specifications provided by the manufacturer stipulate that these are below the threshold of allowable emissions. This impact is therefore insignificant.

*Action: Periodic (monthly) monitoring of emissions should be undertaken, at least for the first year. If emissions are below Namibia's thresholds, then monitoring can be relaxed to once per year thereafter. This should be done through an independent monitoring agency or the official authorities.*

*Verification: Annual certificate of safety issued by MoHSS.*

### 3. Emission of odours

While odours from the operation of waste might be expected, the manufacturer stipulations state that odours are completely masked with the addition of a recommended gel. This impact is therefore insignificant as long as the mitigatory measure is implemented.

*Action: Ensure that the masking agent is employed to avoid offensive odours being emitted. This should be done by hospital staff.*

*Verification: MoHSS.*

### 4. Monitoring of waste segregation practices in the hospital

The effectiveness of the STERILWAVE treatment depends heavily on correct segregation of types of waste that are generated in the hospital. The CoW instructions are clear in this respect. The implementation of these instructions, and more that have come out with respect to preventing contagion of Covid-19, is critical. Therefore waste management procedures in the hospital should be regularly monitored so that the health care waste is segregated into the appropriate waste treatment streams.

*Action: Regularly (at least once per month) carry out spot checks of waste management procedures in the hospital, with respect to correct segregation of waste types and the different kinds of treatment given to each type. Any identified shortcomings in the procedures should be rectified immediately. This should be done by hospital senior staff, and verified through an independent monitoring agency or the official authorities.*

*Verification: Annual certificate of safety issued by MoHSS.*

### 5. Training, usage, and maintenance procedures of the STERILWAVE apparatus

The Namibian Integrated Health Care Waste Management Plan suggests worker training for this technology. This should include:

- a basic understanding of microwaves and steam-based treatment systems,
- standard operating procedures,
- occupational safety (proper waste handling techniques),
- record keeping,
- identifying waste that should not be treated in the unit,

- recognizing shredder problems and what to do when soft waste gets stuck in the shredder section,
- periodic inspections and preventive maintenance,
- contingency plans (e.g., what to do in case of a spill or power outage).

*Action:*

- *Training for use of the STERILWAVE apparatus should be implemented.*
- *The STERILWAVE apparatus should be periodically inspected and well maintained as described in the operating manual, to minimise operational problems and to detect them before they get serious.*
- *While microwave radiation is not hazardous (compared to eg X-rays), there should be periodic testing for microwave energy leakage.*
- *These actions should be done by hospital staff.*

*Verification: Annual certificate of safety issued by MoHSS.*

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