

## WATER RIGHTS AND WRONGS

“ In today’s world water is something more than a source of life.

Deprivation linked to water is a source of poverty, of inequality, of social injustice, and of great disparities in life chances. That deprivation matters because water is a human right – and none of us should turn a blind eye to the violation of human rights. Nor should we tolerate a world in which over 1 million children are, in a perversely literal sense, dying for a glass of water and a toilet.<sup>1</sup>

Kevin Watkins  
Director of the Human Development Report Office

”



## 20 Litres Every Day... The Bare Minimum

ON WORLD WATER DAY 2001 THE UN SECRETARY-GENERAL CHALLENGED THE WORLD TO SOLVE THE WATER CRISIS, AND THE UNDP RESPONDED:



World governments must make 20 litres of fresh, clean water every day a universal human right – as 20 litres is the minimum a person needs to live.



Our lack of progress is obvious. In many countries masses of people still have access to less than 20 litres, or drink dirty water containing faeces, pesticides or other poisons. Also, where safe sources do exist, they are only available to those who can pay.



To fill a container can cost between US \$0.25 & \$1.25, so for the 660 million people who live on only \$2 a day, buying water is simply not possible.<sup>2</sup>

# CASE STUDY

## Saving Water: Veteran Affairs Medical Center, Portland, Oregon, USA

The Veteran Affairs Medical Center in Portland, Oregon (USA) found that its water consumption was 244 million liters per year. As a result, they sought a way to reduce their consumption. The Federal Energy Management Program<sup>3</sup> conducted an audit based on water consumption in taps, dishwashers, boilers, toilets and sterilizers, among other equipment used by the centre.

The audit revealed that sterilization with ethylene oxide (EtO) was consuming more water than other equipment used, including steam sterilization systems (see figure 1)<sup>4</sup>

The centre found that sterilization with EtO required 75 liters of water per minute for system cooling nine hours a day

FIGURE 1  HOT STERILIZATION SURFACES WATER GALLONS REQUIRED AT THE VETERAN AFFAIRS MEDICAL CENTER



FIGURE 2  AMOUNT OF WATER REQUIRED BY EtO FOR STERILIZATION



Figure 2 illustrates the amount of water required for EtO sterilization per hour, day and year. Auditors found 64.6 million gallons of water were used every year. Based on the centre's estimated yearly water usage, a single EtO system could use 3,942,000 gallons of water per year. This could account for up to 6% of total yearly water spend



Because of this audit, the centre established several water saving actions, including switching to a different sterilization method.



The simple removal of the EtO sterilizer suggested run-rate savings of US \$9,000 a year. Although switching to a new sterilization system involved paying US\$30,000 upfront, the audit anticipated a return on investment in 3.3 years.<sup>4</sup>

### ▼ STERRAD SYSTEM WARNINGS

#### HOT STERILIZATION SURFACES

At the end of a cycle, the interior of the sterilizer may be hot. Do not touch the inside of the chamber or door with your bare or gloved hands. Allow the sterilizer to cool before touching interior surfaces.

#### AVOID EXPOSURE TO ULTRAVIOLET LIGHT

The hydrogen peroxide monitor uses an ultraviolet light source located inside the camera behind the door. To avoid eye injury, do not stare directly at the ultraviolet light source for an extended period of time.

# Air Pollution



## THE HARMFUL ADDITION OF TOXIC GASES

such as CO and others to the atmosphere that affect the normal development of plants & animals and negatively impact human health.<sup>5</sup>

Air pollution is caused by exhaust fumes from combustion engines, by domestic heating appliances and by industries, released into the atmosphere as gases, vapours or solid particles capable of staying in suspension, with values above normal and which impair the life and health of both humans and animals and plants.<sup>6</sup>

Low-temperature sterilization systems such as ethylene oxide and formaldehyde, although not combustion systems, release CO and CO<sub>2</sub> into the atmosphere, making the already very complex pollution problem in many cities worse. These same gases are responsible for the greenhouse effect in which average temperatures are rising across the planet.

## RELEASE OF CO<sub>2</sub>

ETO → 3.36KG CO<sub>2</sub>

FO → 0.96KG CO<sub>2</sub>

AMOUNT RELEASED PER CYCLE<sup>7</sup>

# The sterilization cycle of STERRAD™ systems releases oxygen O<sub>2</sub> and water vapour H<sub>2</sub>O into the environment



Although carbon dioxide itself is not toxic in the air and actually supports plant growth, it is toxic in enclosed environments and its environmental danger lies in the fact that environmentalists showed in the 1990s that excess carbon dioxide is another form of pollution, as it is the main reason for global warming.<sup>8</sup>



**We can all do a lot to improve the quality of the air we breathe**



Use your car less and public transport more



Walk or ride your bike



Recycle whenever you can



Stop smoking and encourage other people to stop too



Make sure everything you buy and use is environmentally friendly



## ETHYLENE OXIDE (EtO)

Toxic and carcinogenic for operators

A fan and resistance are switched on during the aeration cycle (14 hours)

Residual gases released into the environment include but are not limited to CO and CO<sub>2</sub>, responsible for the greenhouse effect



## FORMALDEHYDE (FO)

FO is carcinogenic to operators and presents a risk to patients if the process is not correct<sup>9</sup>

It is a residue that decomposes into CO<sup>10</sup> in the environment

Large amounts of water are used to break down FO after each cycle



## STERRAD™ HYDROGEN PEROXIDE GAS PLASMA

Non-toxic and non-polluting O<sub>2</sub> and H<sub>2</sub>O cycle waste

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**ASP** Advanced Sterilization Products

ASP International GmbH Zug Branch  
Bahnhofstrasse 2, Zug 6300, Switzerland  
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ADVANCED STERILIZATION PRODUCTS, INC.  
33 Technology Drive, Irvine CA 92618, USA

EC

REP

ASP, The Netherlands BV  
BIC 1, 5657 BX Eindhoven, The Netherlands

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- 4) U.S. Department of Energy, Federal Energy Management Program. Water Efficiency Case Study - Veteran Affairs Hospital, January 3, 2007
- 5) <http://contaminacion-ambiente.blogspot.com/>
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- 10) Formaldehyde CAS number is 50-00-0: [https://commonchemistry.cas.org/detail?cas\\_rn=50-00-0](https://commonchemistry.cas.org/detail?cas_rn=50-00-0)

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