



Sustainable Safe Drinking Water for Children of Developing Countries

Prepared for Elmvale Water Festival
Saturday August 16, 2008

Unsafe Water Kills More Children than Malaria, War and HIV/AIDS combined



BAD WATER KILLS MORE CHILDREN THAN WAR.
SUPPORT THE "ONE DROP OF WATER" PROJECT. SMS "DROP" TO 72 960 TO DONATE 50 SEK. WWW.UNICEF.SE

unicef 

How important is safe water?

- 2 million children (most under the age of 5) die each year for lack of clean drinking water (one every 8 seconds)
- 4 billion annual cases of diarrhea create chronic illness and keep children out of school
- Patients with water borne disease occupy 50% of hospital beds in Africa
- WHO reports that contaminated water contributes to 80% of all sickness and disease worldwide.













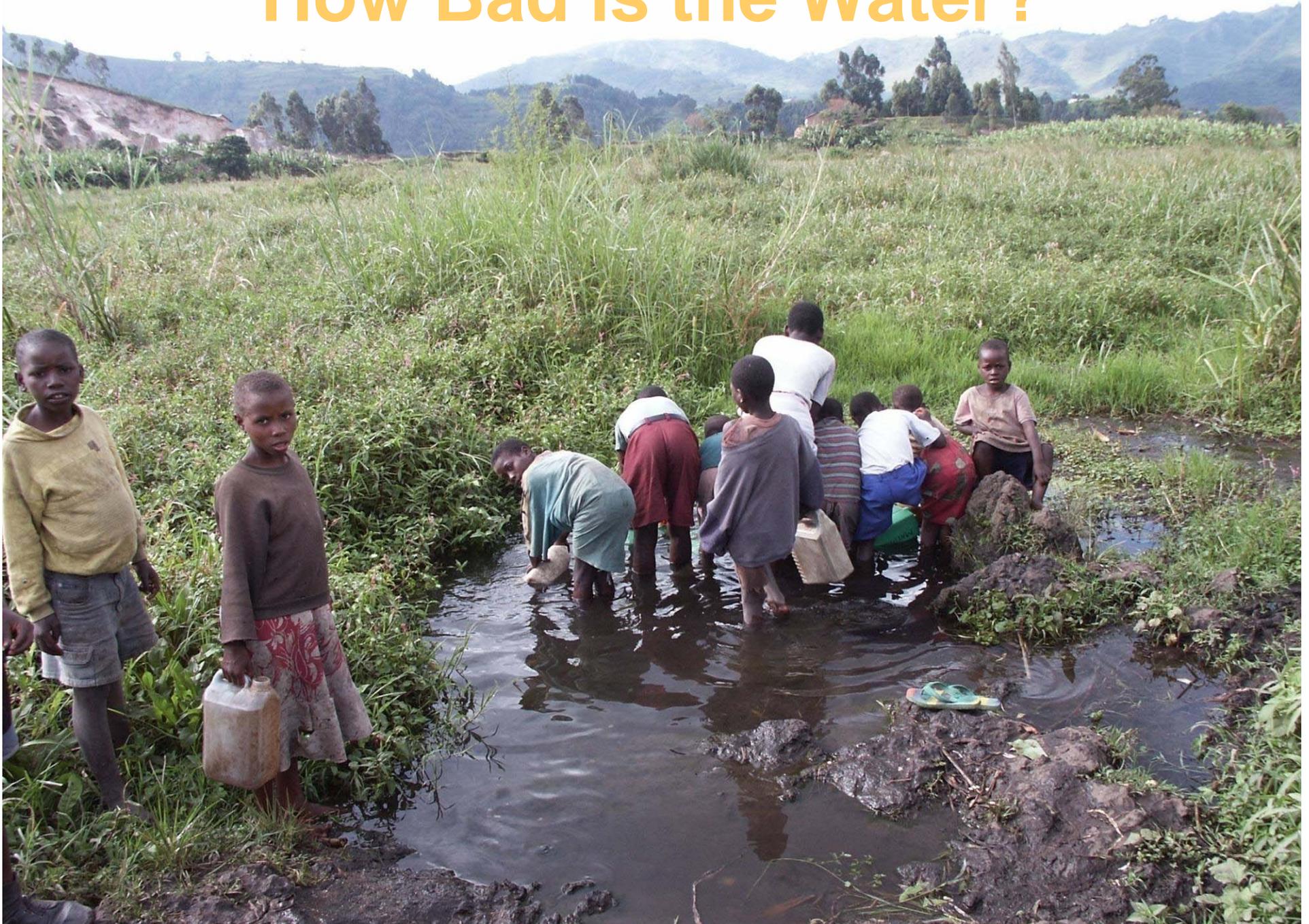






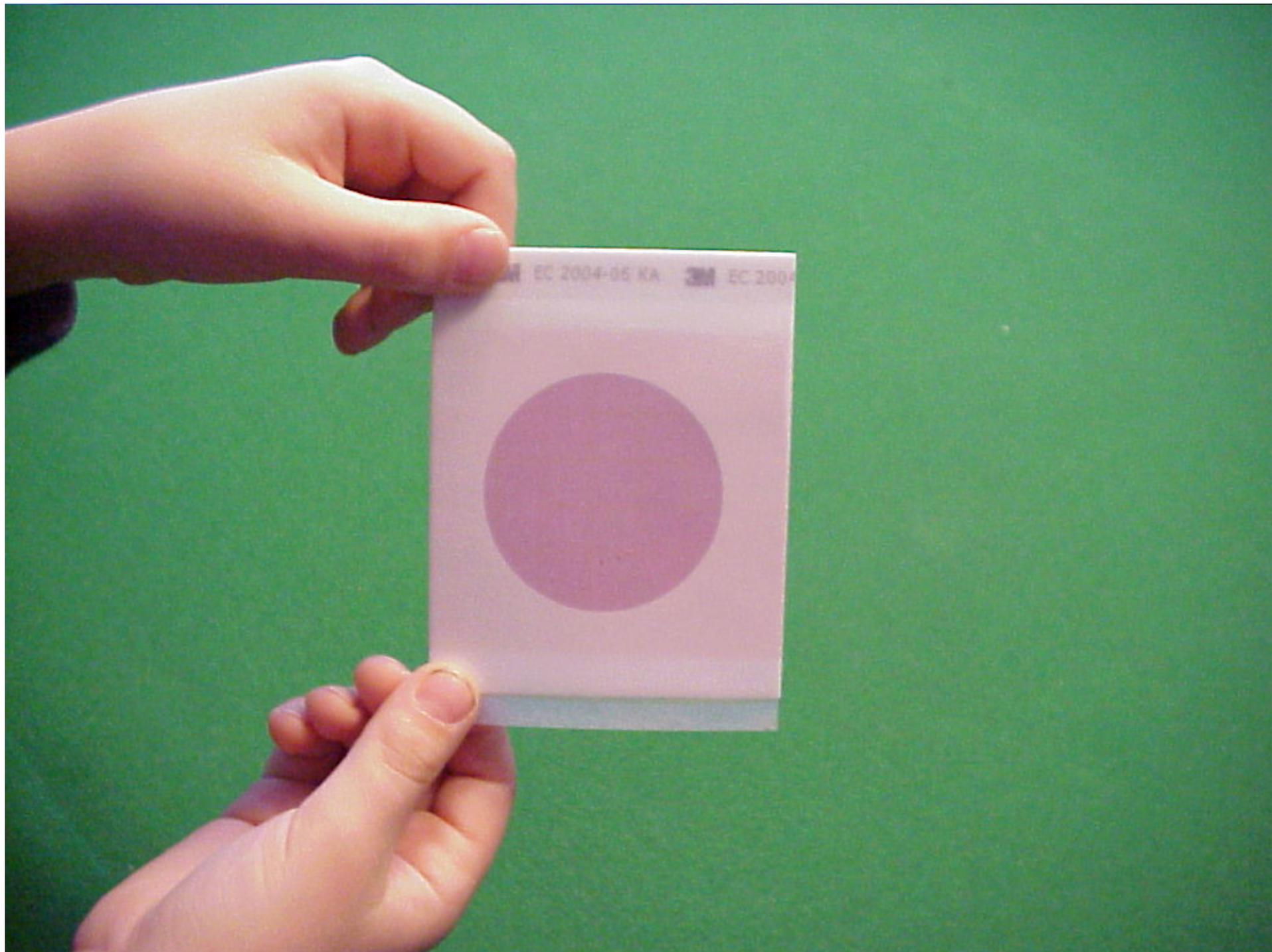


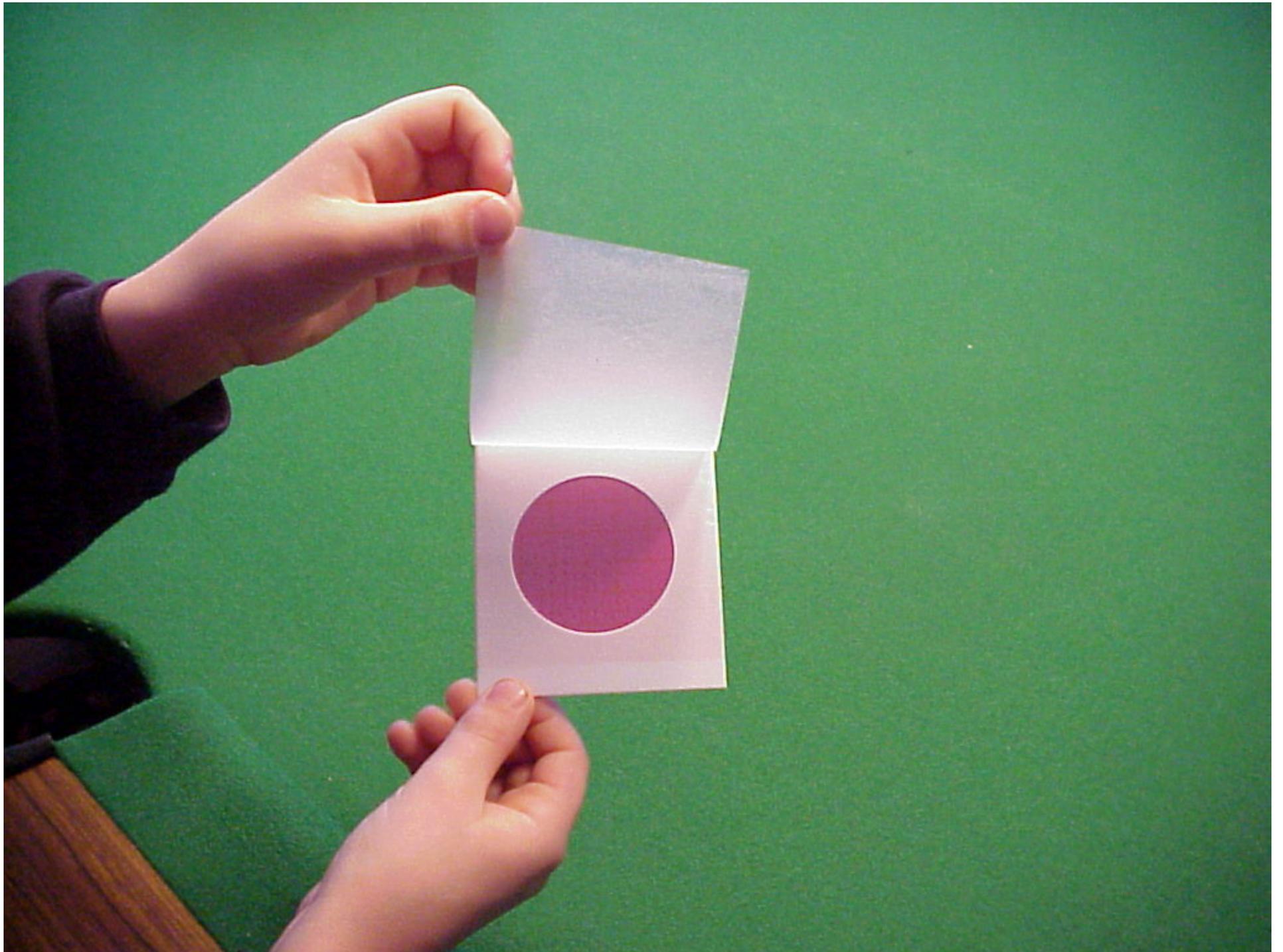
How Bad is the Water?



E. coli

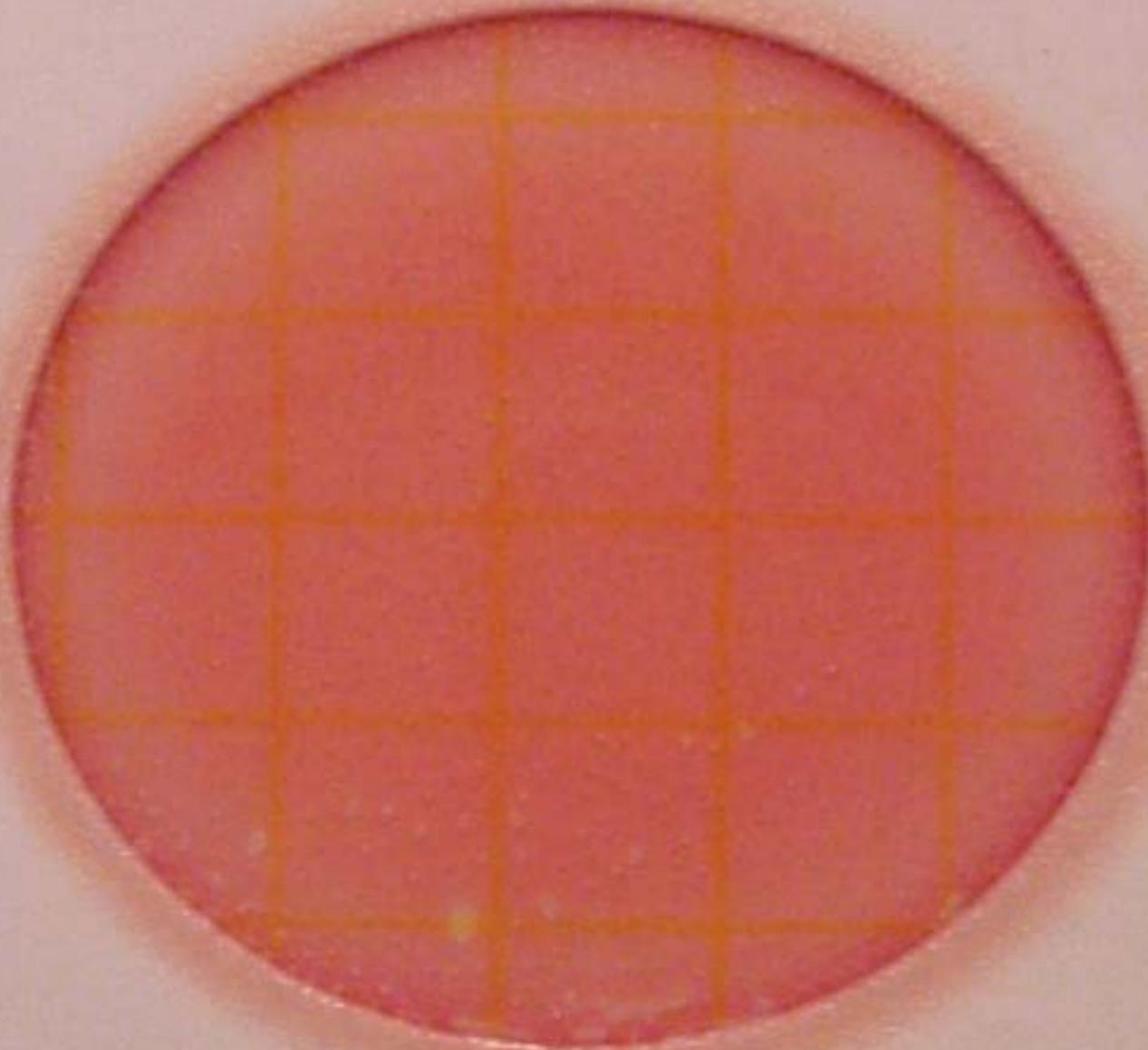
The image features a blue gradient background that transitions from a lighter blue on the left to a darker blue on the right. A thin, light blue curved line starts at the top left and arcs across the upper portion of the frame. In the lower right corner, there is a semi-transparent, light blue curved shape that overlaps the darker background.



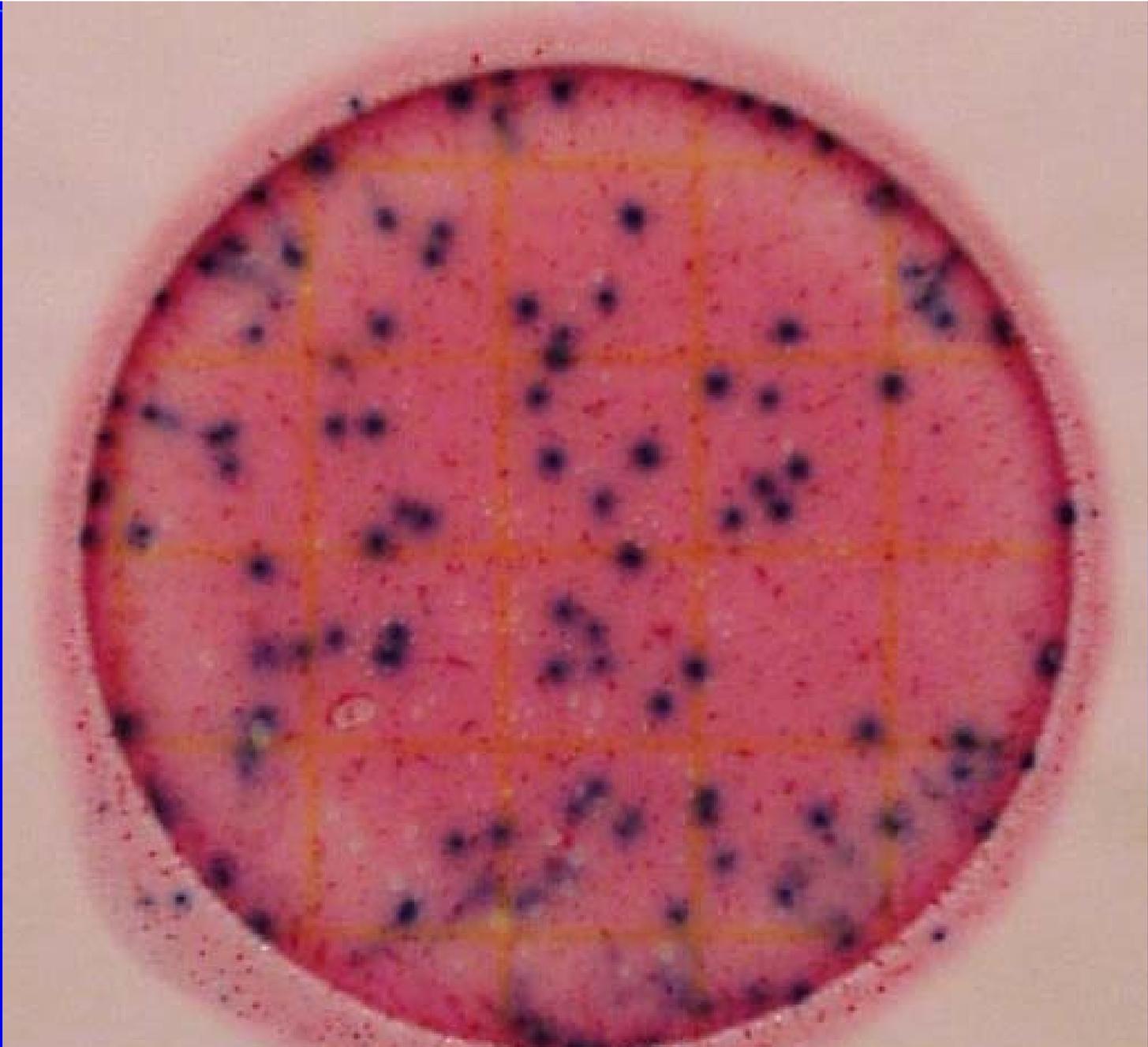








Drinking Water - Canadian Children



Drinking water – African children

WHO

E. coli levels in drinking water



WHO Accepted Methods of Purifying Drinking Water

- Boiling
- Chlorination
- **SODIS**
- Filtration

Solar **DIS**infection

Using the Sun's Ultraviolet (UV) Rays to
Disinfect Drinking Water

Where Did UV Disinfection Come From?

- Invented by the Creator of the universe
- Used by the Romans over 2000 years ago
- Father of modern day studies – Professor Aftin Acra, University of Beirut in Lebanon in early 1980s.
- Studied in detail for the past 20 years by a Swiss funded group SANDEC/EAWAG who coined SODIS



Fill disposable plastic bottles with water





Place bottles flat on a hard surface

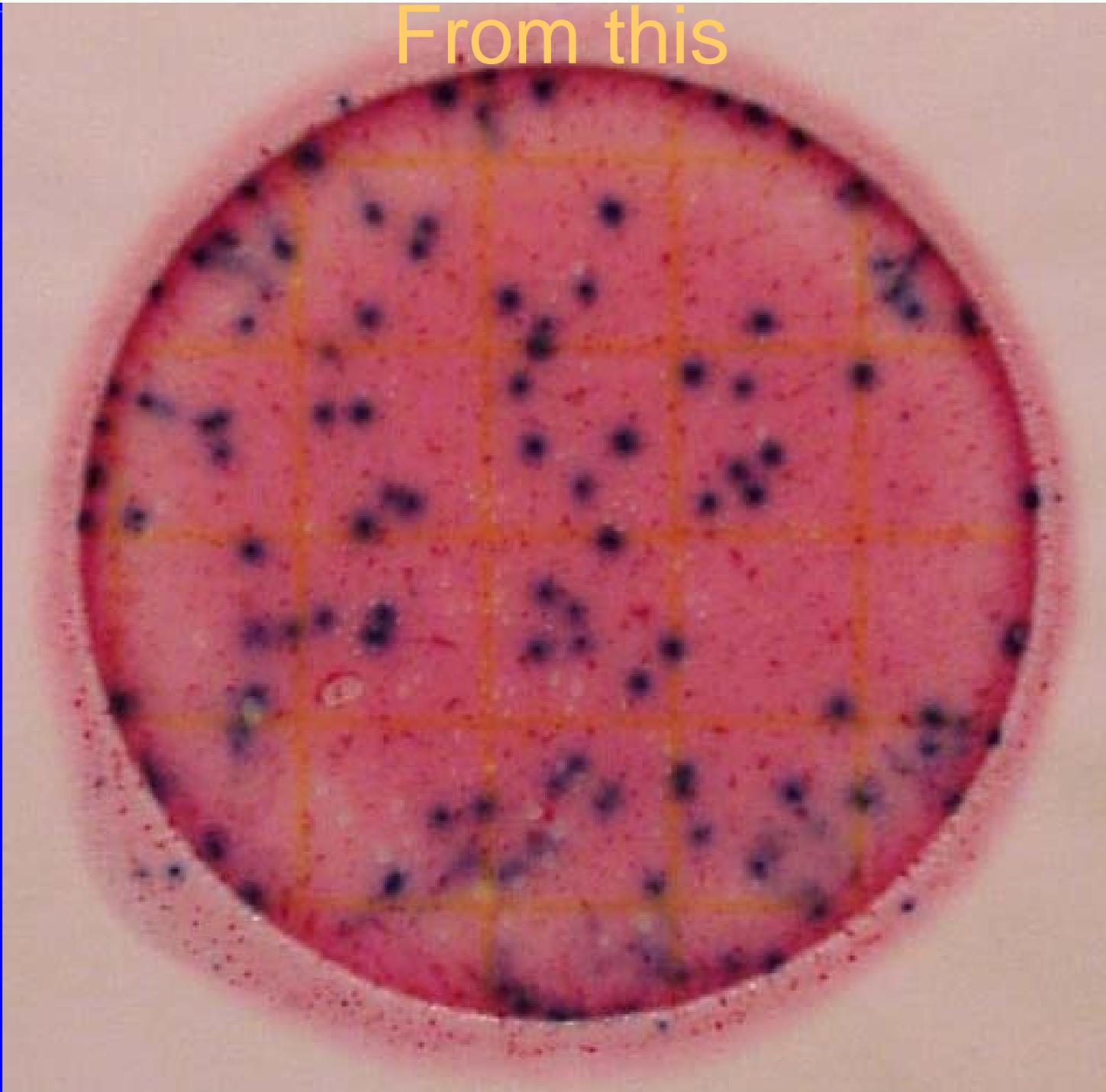
For 1 full sunny day



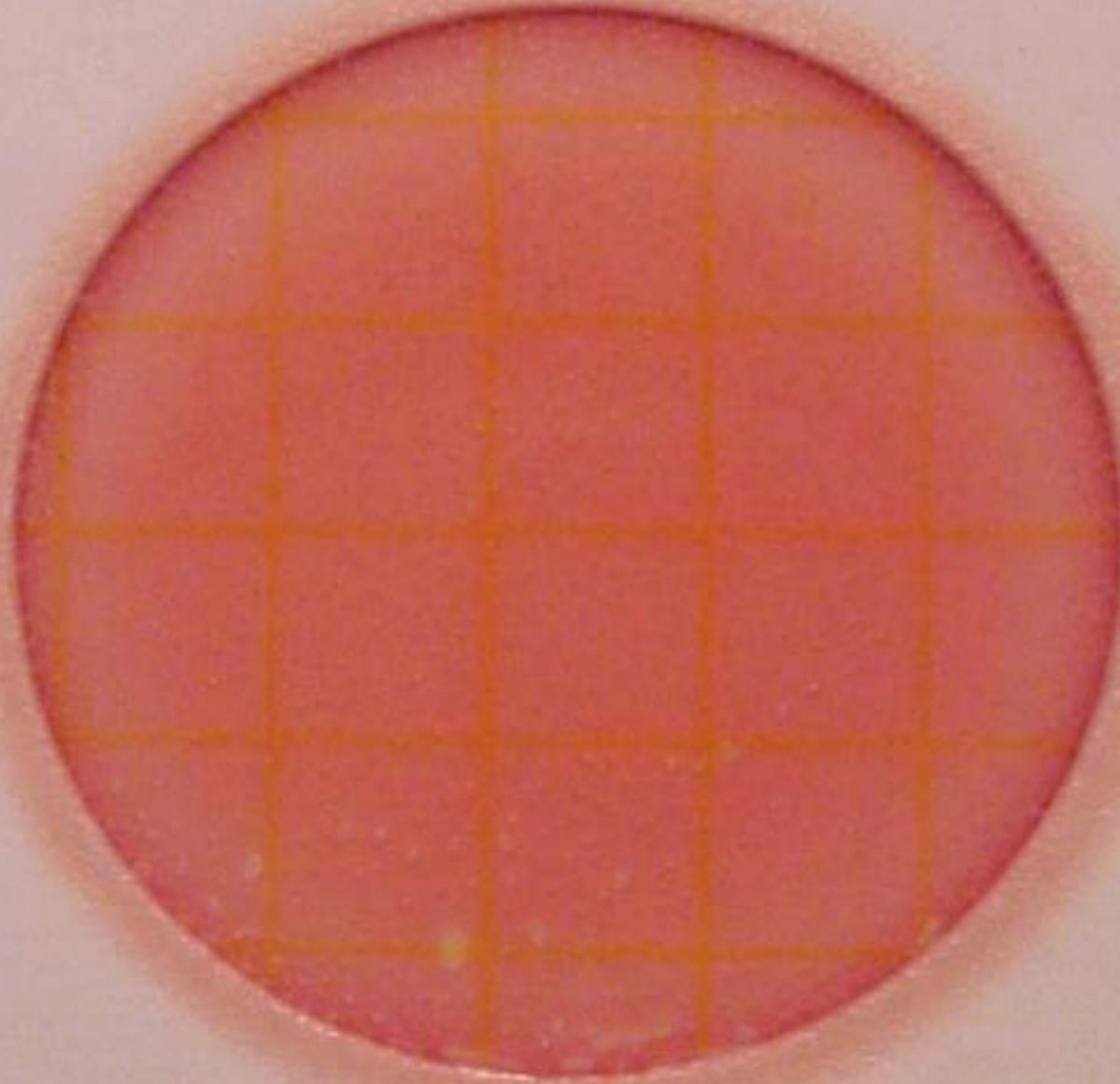
Or 2 full cloudy days



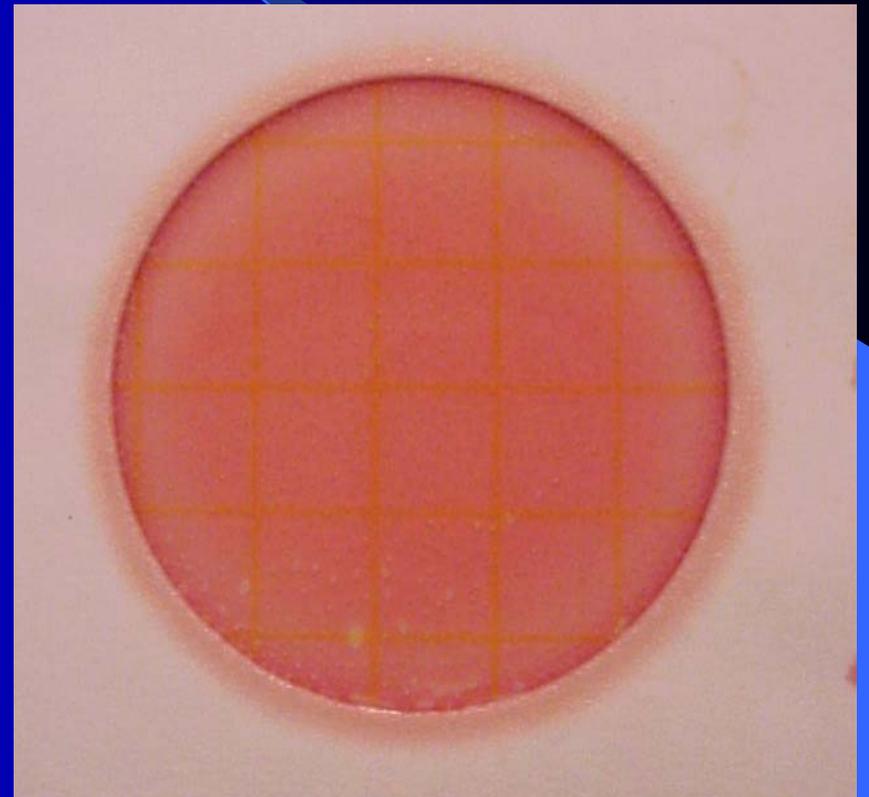
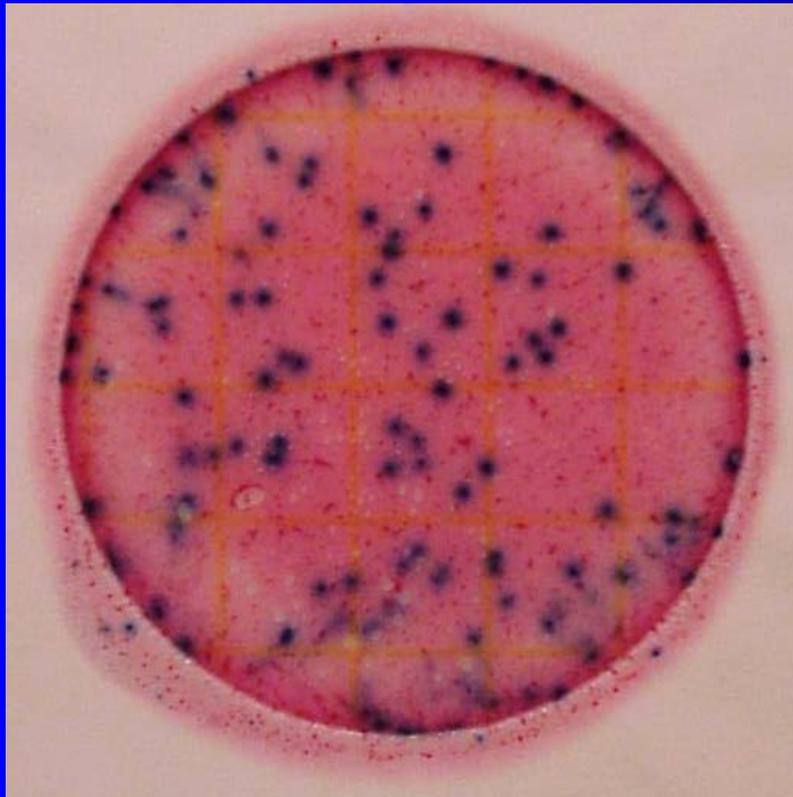
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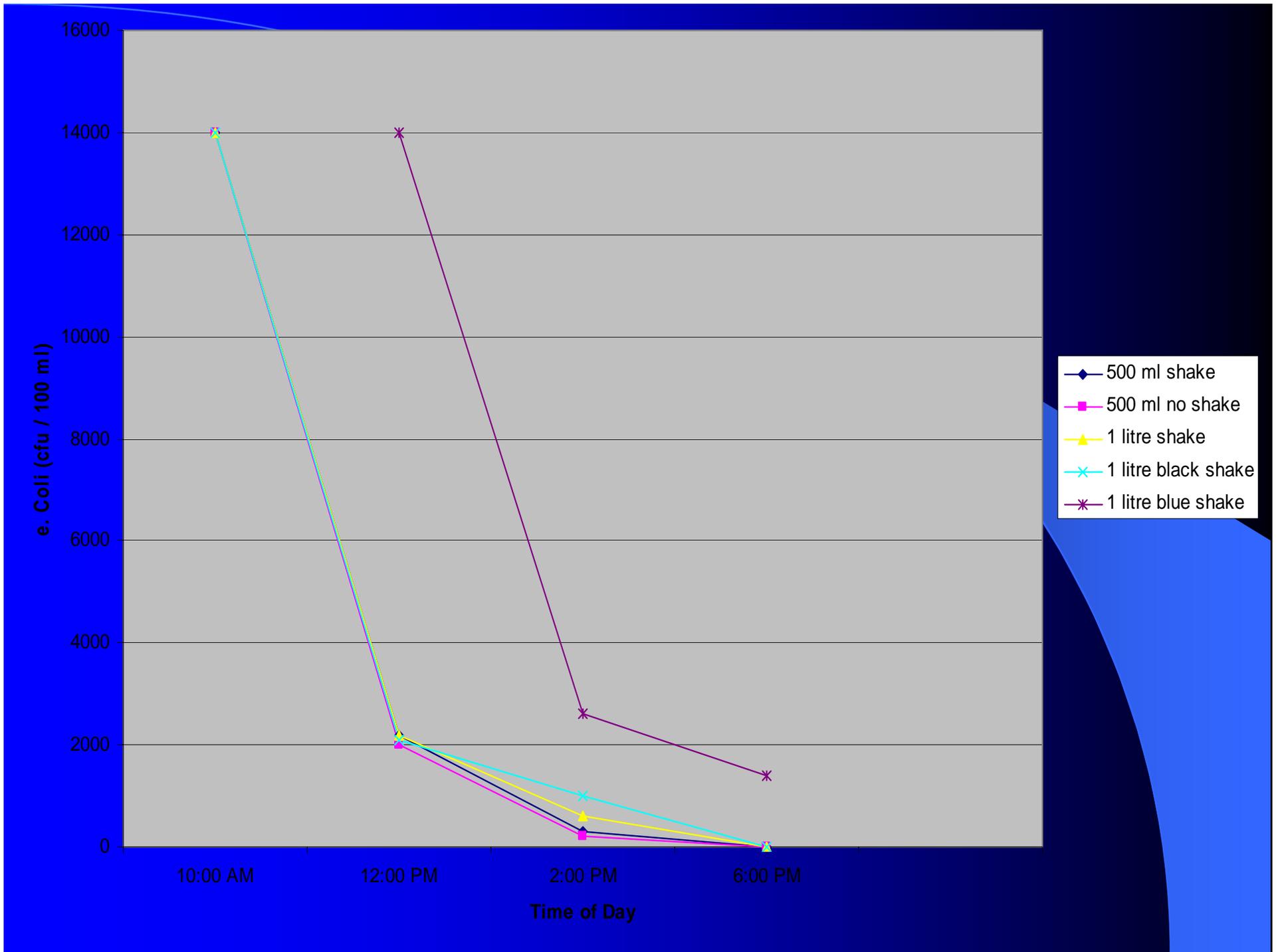


To This



E. coli Reduction after only a few hours of sun





Which pathogens are killed by SODIS?

Pathogen	Illness	Reduction through SODIS ** at water temperatures of 40°C and solar exposure of 6 hours
Bacteria		
E.coli	Indikator for Water Quality & Enteritis	3-4 log (99.9 -99.99%)
Vibrio cholera	Cholera	3-4 log
Salmonella spp.	Thyphoid	3-4 log
Shigella spp.	Dysentery	3-4 log
Campylobact. jejuni	Diarrhoea	4 log
Yersinia enterocolitica	Diarrhoea	4 log
Viruses		
Rotavirus	Diarrhoea, Dysentery	3-4 log
Polio Virus	Polio	3-4 log
Hepatitis Virus	Hepatitis	Red. of cases of SODIS users
Protozoa		
Giardia spp	Giardiasis	noninfective cysts
Cryptosporidium spp.	Cryptosporidiasis	noninfective cysts (10 hours)
Amoeba spp	Amoebiasis	1 hour above 50°C! cysts inactivated





















Changing Culture Through Children









What about plastic leaching?

What do you do with used bottles?







SODIS - Advantages

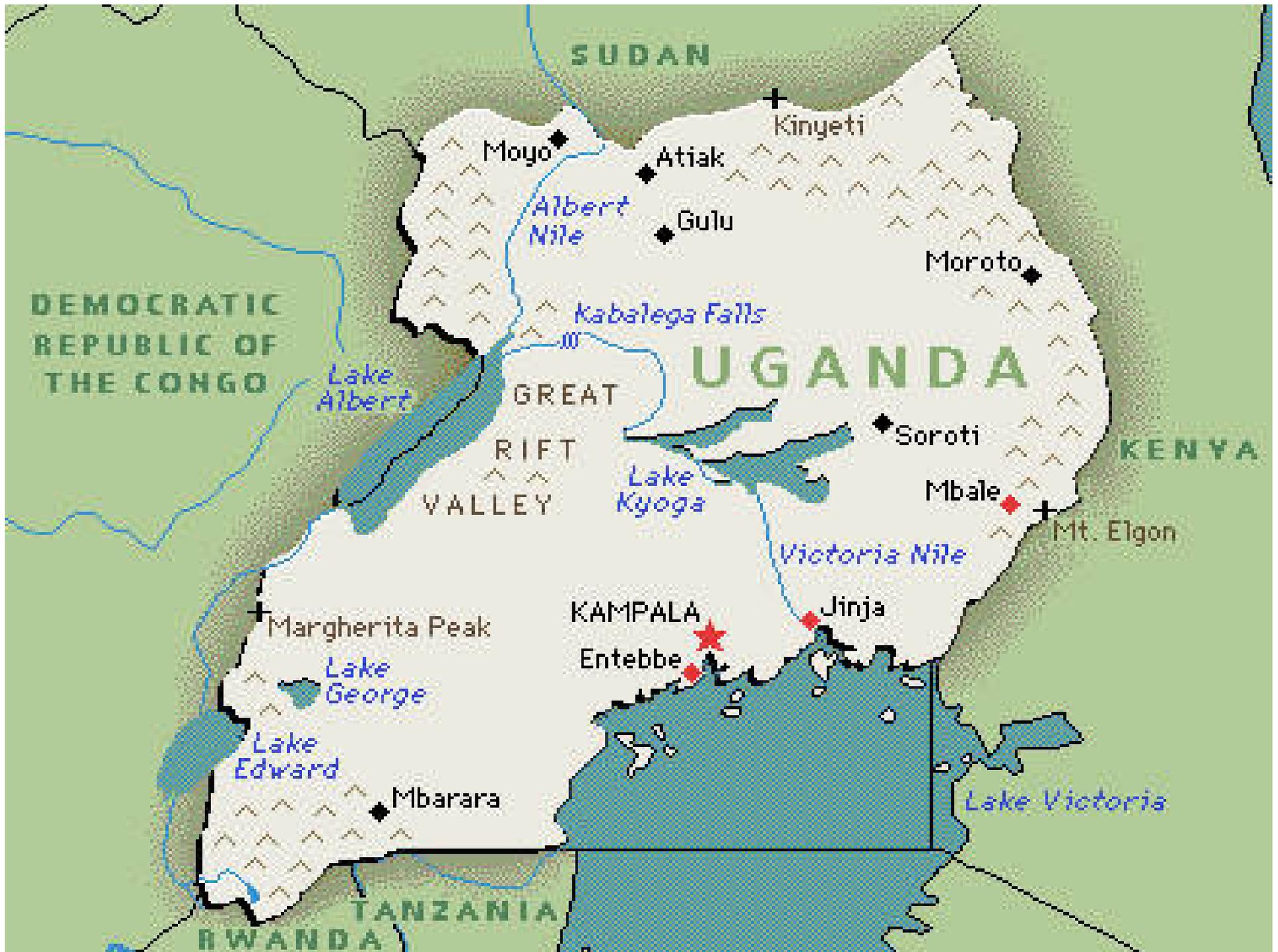
- Easy to use, easy to teach
- Low cost
- No maintenance
- 100% local resources
- Does not change taste of water
- Uses the sun – our most plentiful resource
- No chance of recontamination

“Because of the simplicity, low cost and the need for only beverage bottles and sunlight, solar disinfection is an appropriate technology for disinfection of household water in the developing world.”

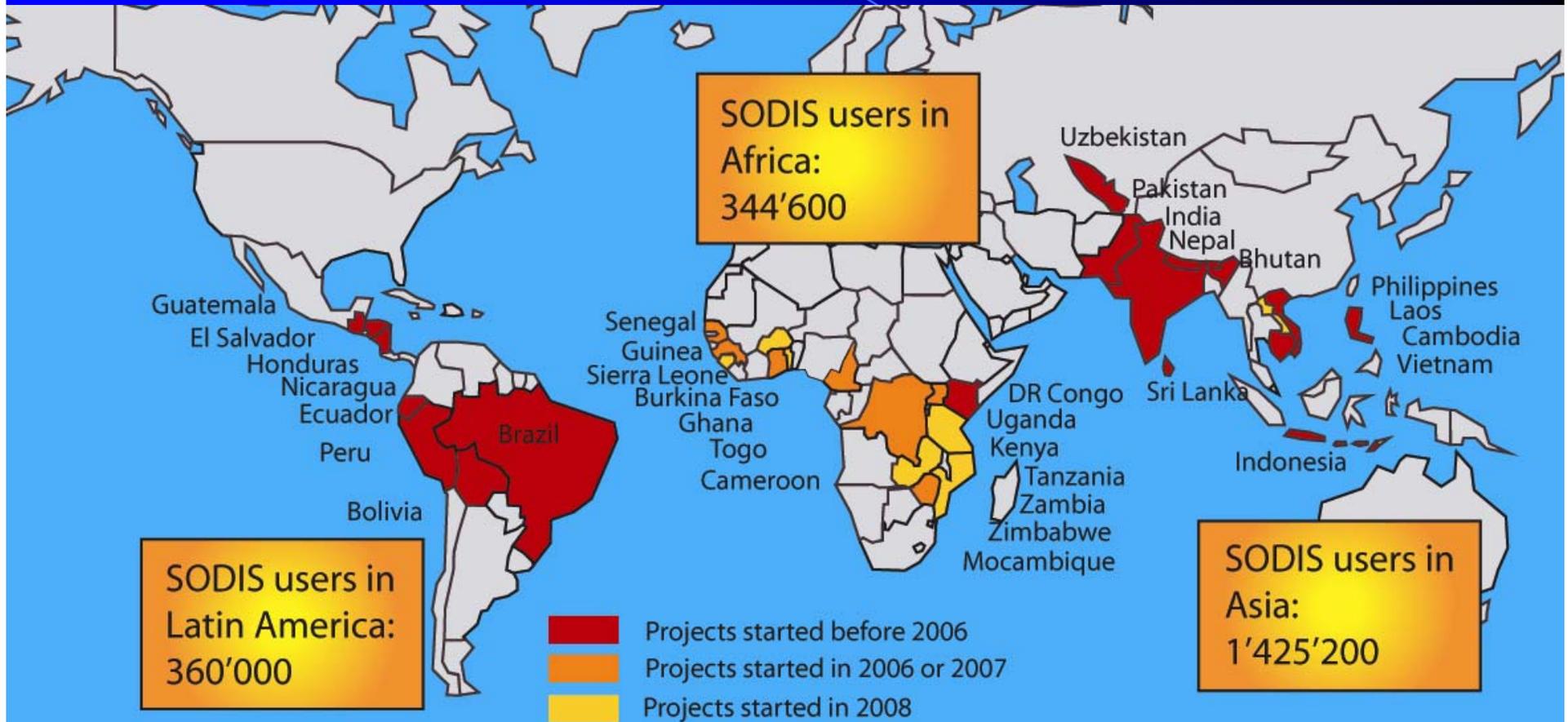
World Health Organization (WHO).

“The most effective vaccine against child death in Africa is a glass of clean water.”

Kevin Watkins- Author of the UN Human Development
Report - November, 2006



Worldwide use of SODIS



Cheers to Clean Water!







www.thewaterschool.org



www.sodis.ch