

# **Research on Removal of Mosquito Eggs and Larva by Fiber Media Rapid Filter in Water Reclamation Project for Toilet Flush use**

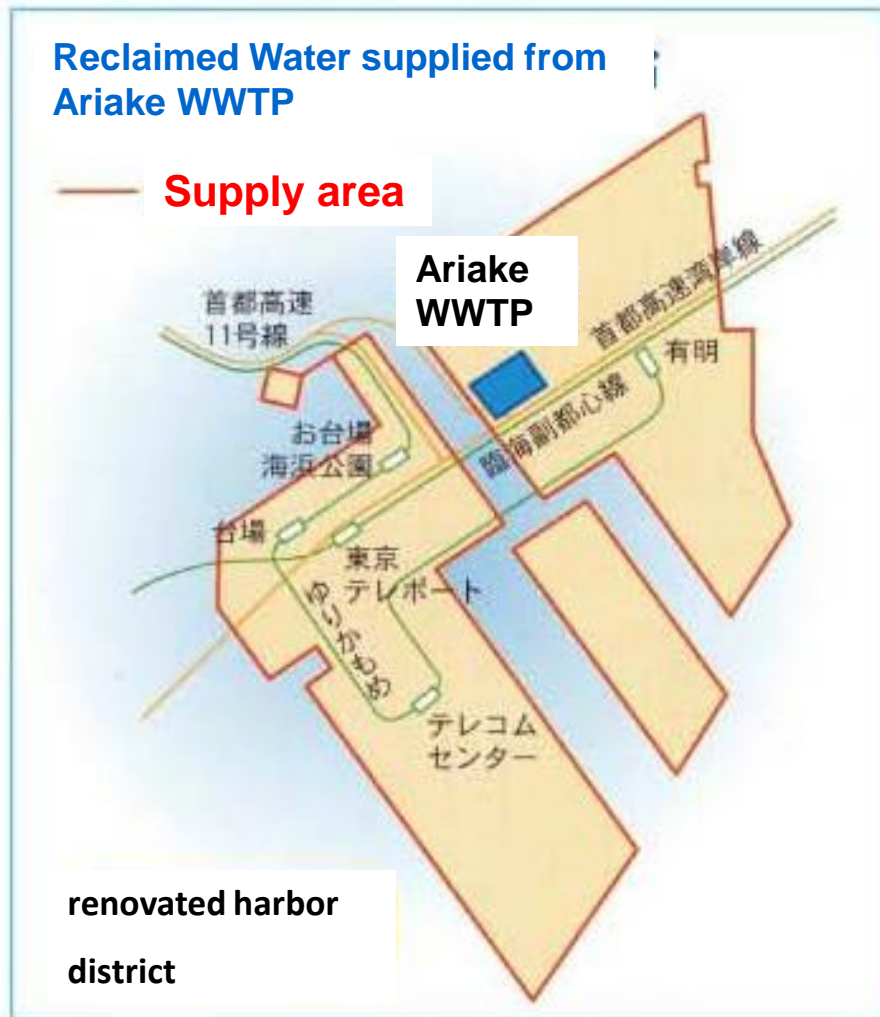


**Bureau of Sewerage,  
Tokyo Metropolitan  
Government (TMG)**

# Background

- **TMG operates reclaimed water supply service at a renovated harbor district called Ariake.**
- **Reclaimed water is used for flushing toilets, cleaning train cars, and watering greenery.**
- **Customers using it as toilet flush complained about mosquito infestation in their flush water tanks.**
- **Use of pesticide, cleaning, introduction of sand filtration, increased use of chlorine did not work.**
- **TMG decided to install a rapid fiber filter.**

# Service Area of Reclaimed Water



aerial view of service area

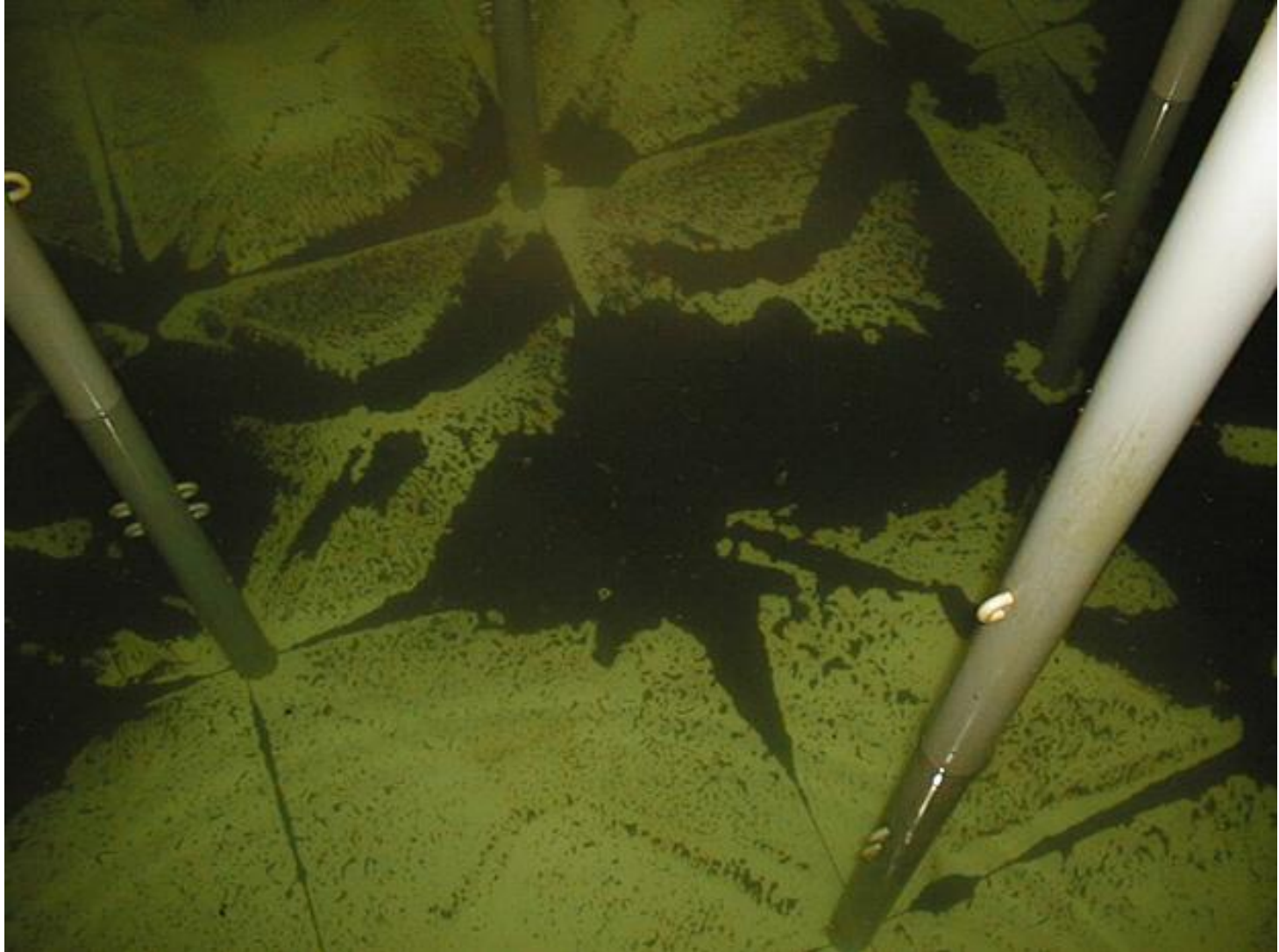


Taken from website of Bureau of Sewerage, TMG

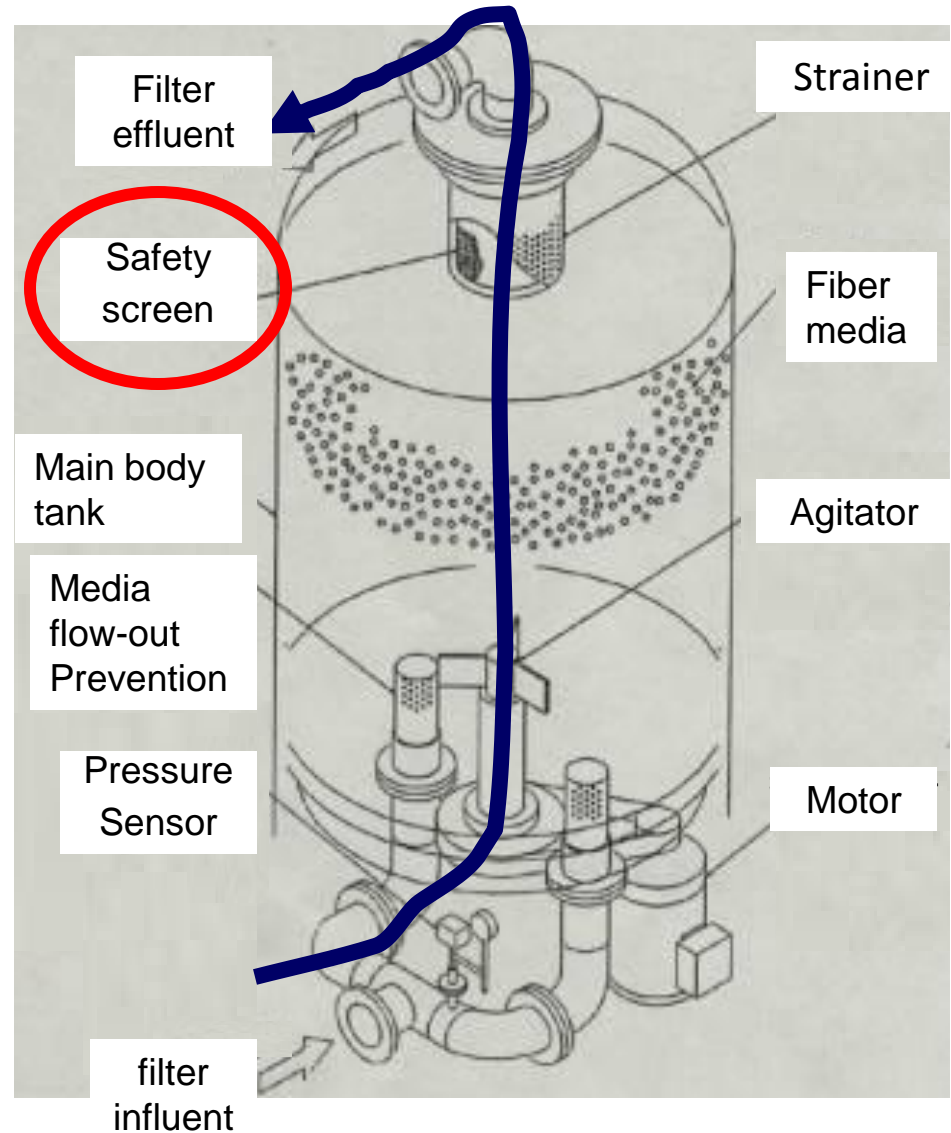
# Toilet Flush Tank filled with Larva



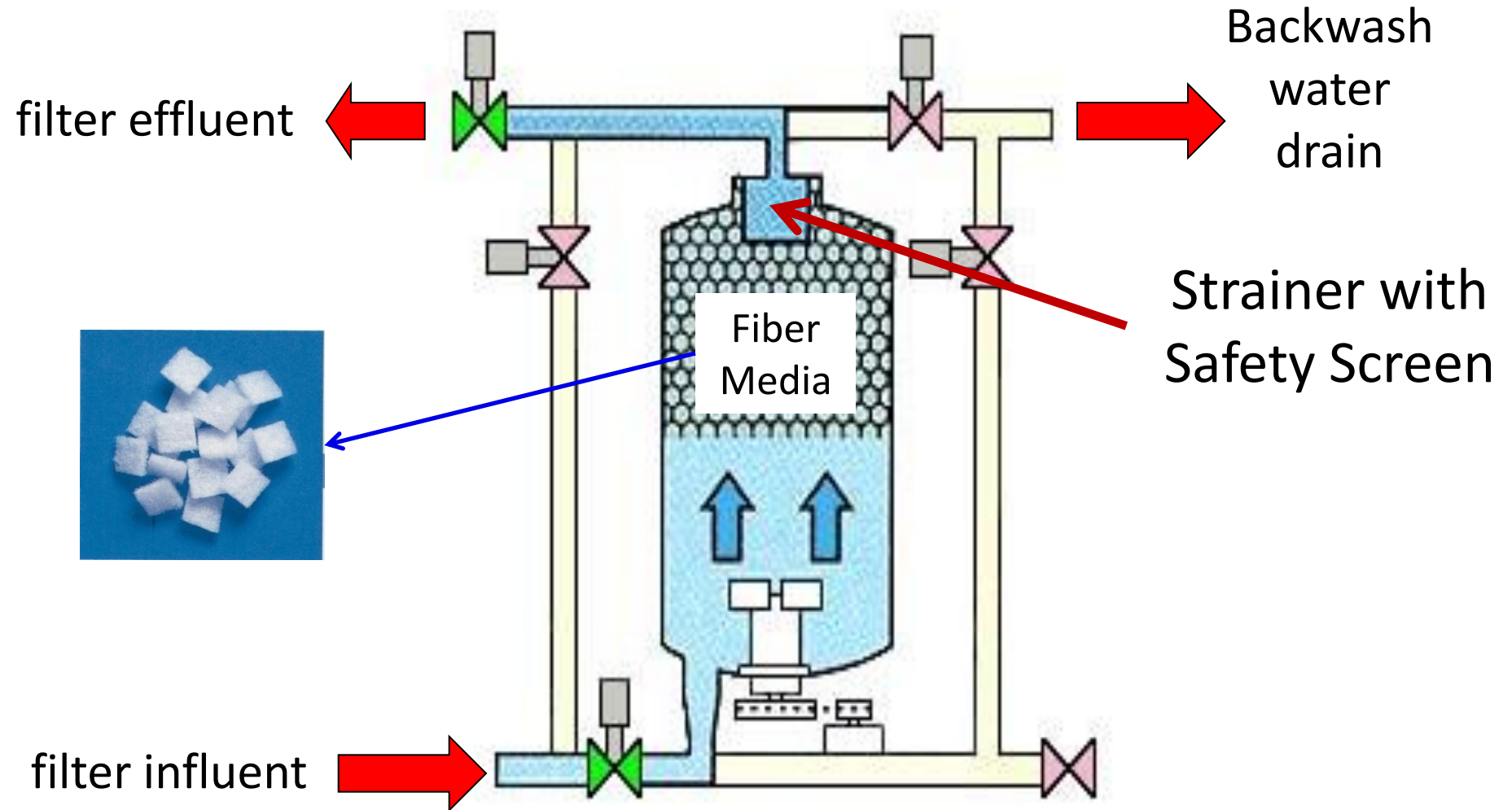
# Reservoir of Reclaimed Water at Hotel Filled with Mosquito



# Outline of Fiber media rapid filter

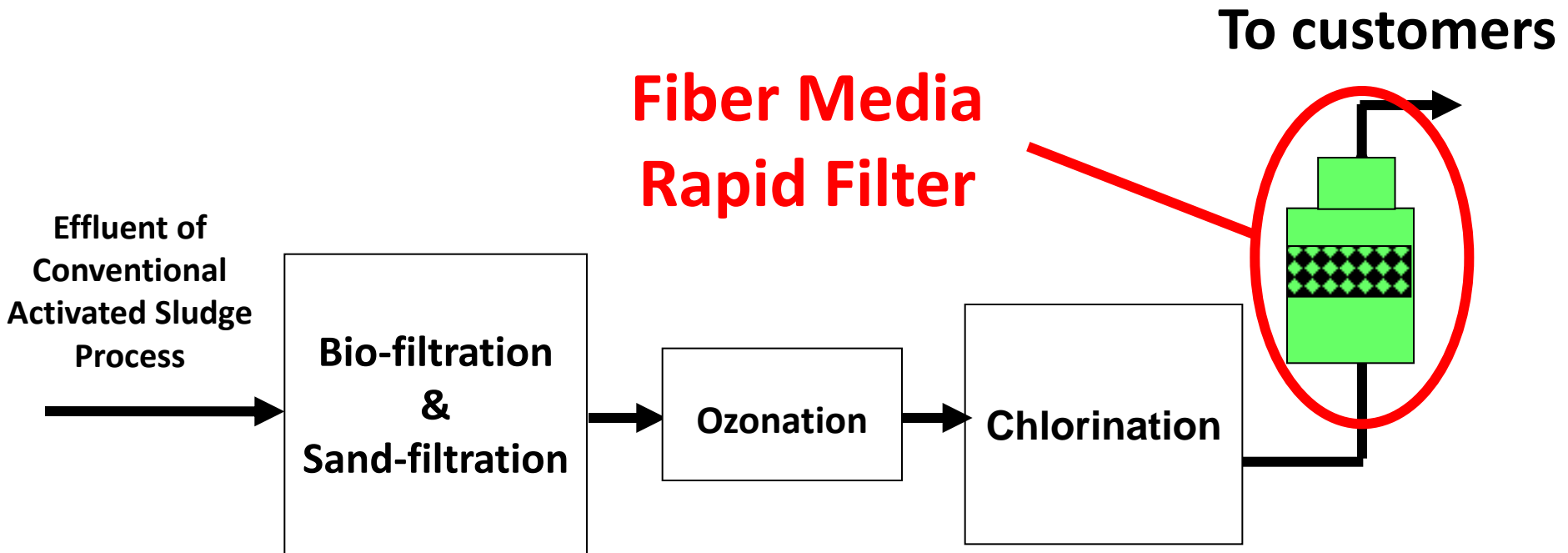


# Structure of Fiber Media Rapid Filter



Backwash can be done with filter influent.

# Treatment Process Train for Production of Reclaimed Water





# Comparison

	Conventional sand-filtration	The Fiber Media Rapid Filter
Filter Media	Sand	Polypropylene
Porosity	0.3 - 0.4	0.94
Filtration rate	200 - 300 (meter per day)	1,000 (meter per day)
backwash water (%)	3 – 10	< 1
Remarks		Screen Pore Size; 33 $\mu\text{m}$

# Egg & Larva Counts of Filter Influent & Effluent

	filter influent		filter effluent	
month	Egg count/m <sup>3</sup>	Larva count/m <sup>3</sup>	Egg count/m <sup>3</sup> )	Larva count/m <sup>3</sup>
May	0	10	0	0
June	0	8	0	0
July	0.05	51	0	0
Oct.	0	1	0	0
Dec.	0	1	0	0
Feb.	0	0	0	0

No larva/eggs detected in filter effluent

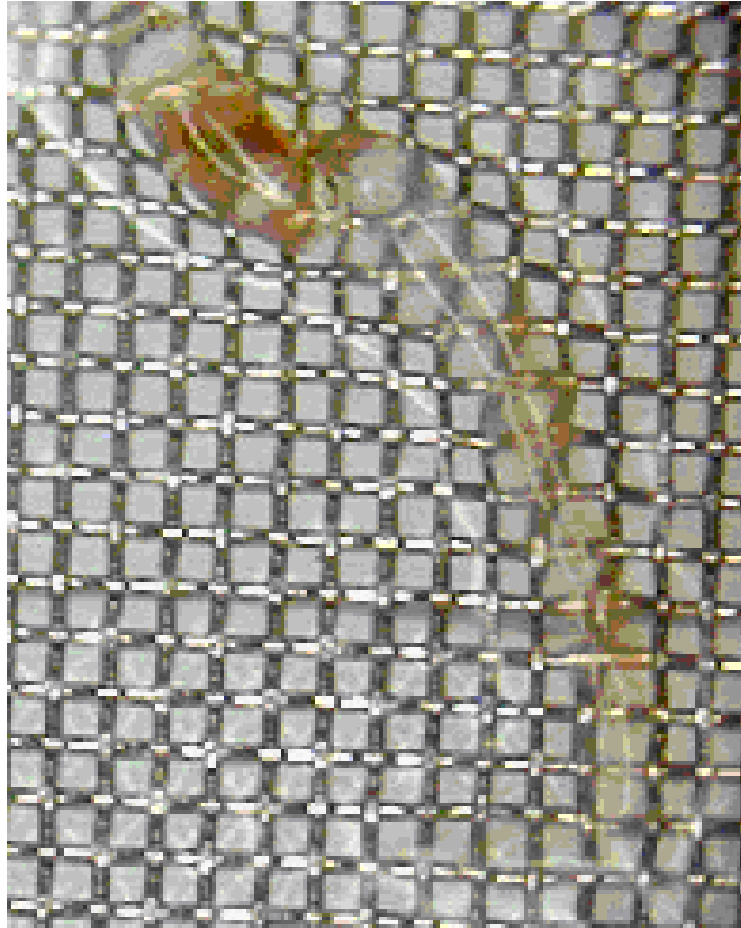
# Counts of eggs & larva in filter tank & on Safety Screen

	in filter tank		on safety screen	
Month	Egg	Larva	Egg	Larva
May	0	176	—	—
June	0	170	0* 0**	3,768* 672**
July	0	476	24	816

Note; The larva observed in filter tank were crushed due to mechanical agitation during backwashing

\* Data right before backwashing, \*\* Data right after backwashing

# Trapped Egg & Larva on Safety Screen



# Reservoir before & after installation of the Fiber Media Rapid filter

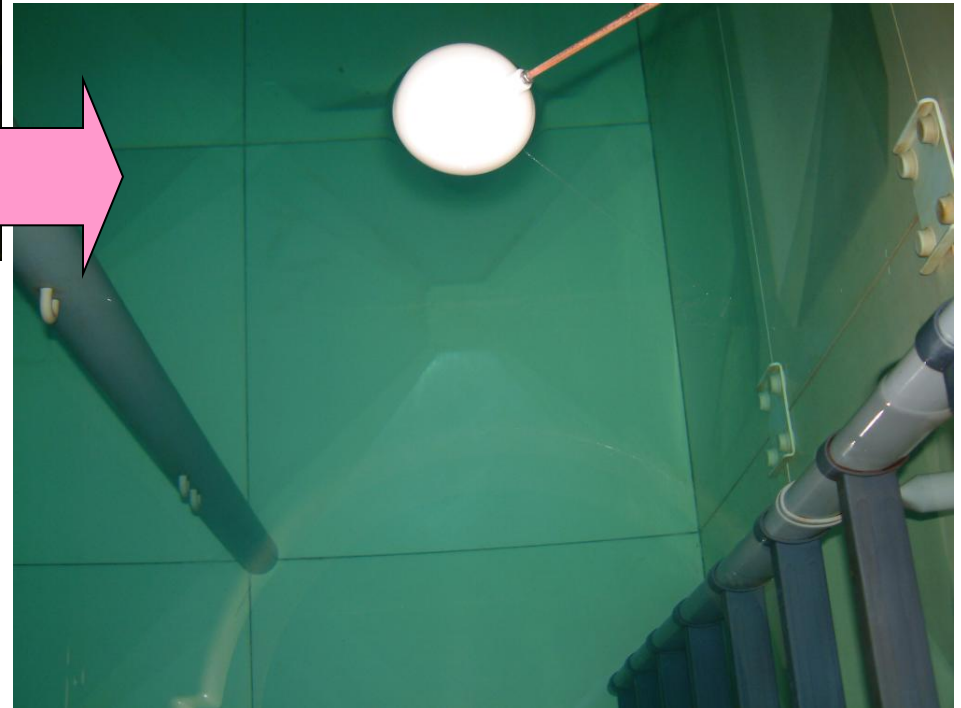


June, 1999

Before

September, 2002

after



# Conclusion

- Fiber Media Rapid Filter applying safety screen effectively trapped mosquito larva and eggs, leading to mosquito-free reclaimed water.
- Safety screen at the strainer of Rapid Fiber, where filter effluent finally goes through, is enough to trap eggs & Larva without choking safety screen for long time due to being combined with Fiber Media Rapid Filter.
- By installation of the rapid fiber filter, TMG successfully contained the customer complaints about mosquitoes.

# Postscript

- This presentation was based on a paper titled “Research on Removal of Mosquito Eggs and Larva by Polishing Filter with Fiber Media” in the proceedings of R&D 2003 issued by Sewerage Bureau of Tokyo Metropolitan Government.
- JSWA made this presentation with the courtesy of the author and ISHIGAKI, the manufacturer of the fiber media rapid filter.
- For more information about the presentation, please email [info@gcus.jp](mailto:info@gcus.jp)
- JSWA staff answer your questions after consultation with the author.