

INTRODUCING **BUSSE ENGINEERING GmbH** ADVANCED SCALABLE MBR WASTEWATER TREATMENT SYSTEMS



Wastewater recycling in decentralized areas

**Small 'Plug & Play'
Wastewater Treatment Plants with
submerged ultra micro filtration membranes**

**Installed above grade in a garage, shed,
basement or other area on site**

**NO tanks or excavation
Self contained, closed loop retention
and pre-treatment**

Produces Class A effluent

Available for reuse (as permitted)



BUSSE

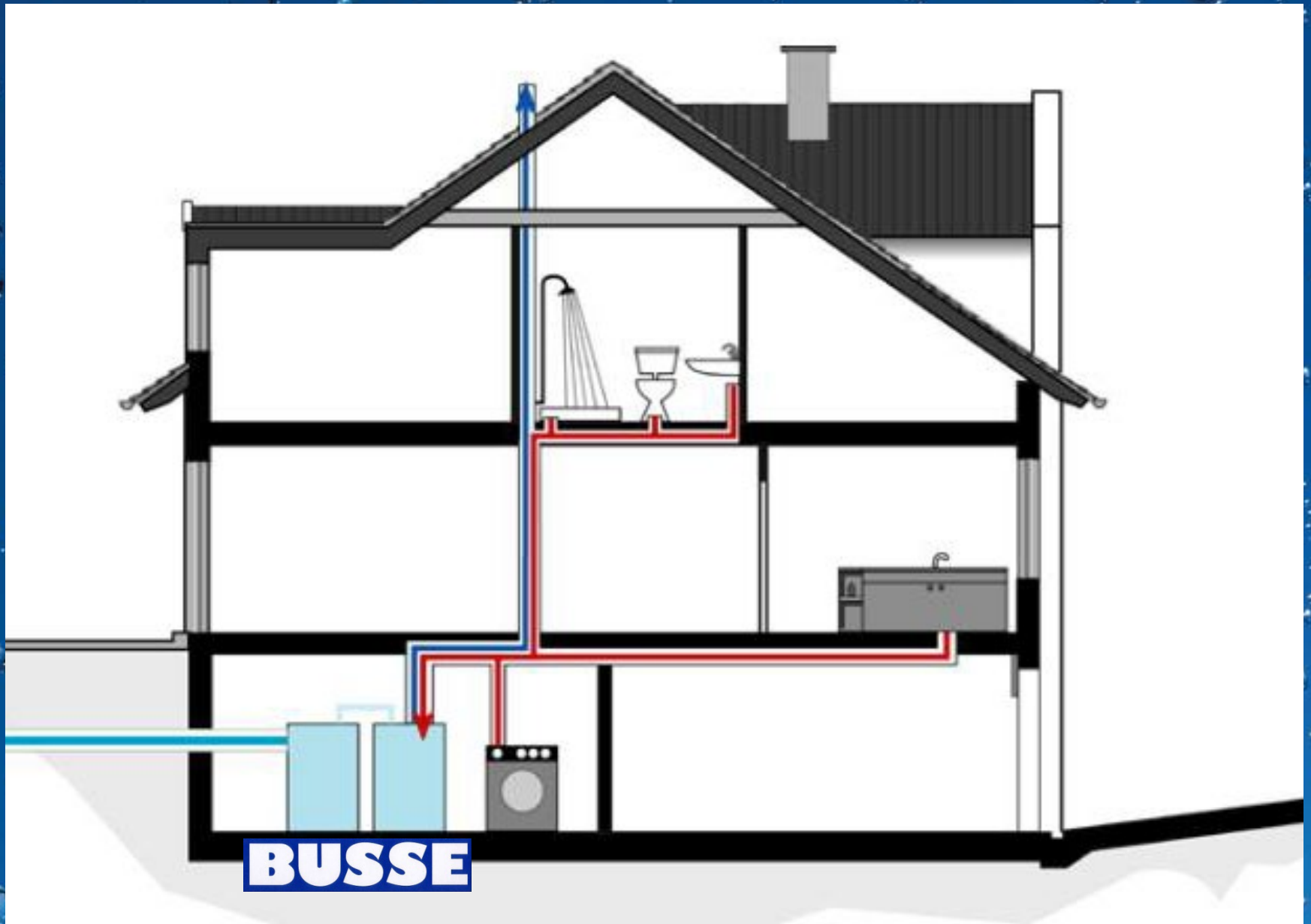
Protecting Drinking Water

- **The versatility and the adaptability of the BUSSE GT treatment system will allow more homeowners at difficult sites to utilize clean treatment and disposal in sensitive watersheds**
- **Clean effluent disposal not only protects drinking water resources but protects sensitive eco-systems, promotes recharging and encourages smart growth**
- **Responsibly enhanced wastewater disposal protects property values and benefits the communities water resources**

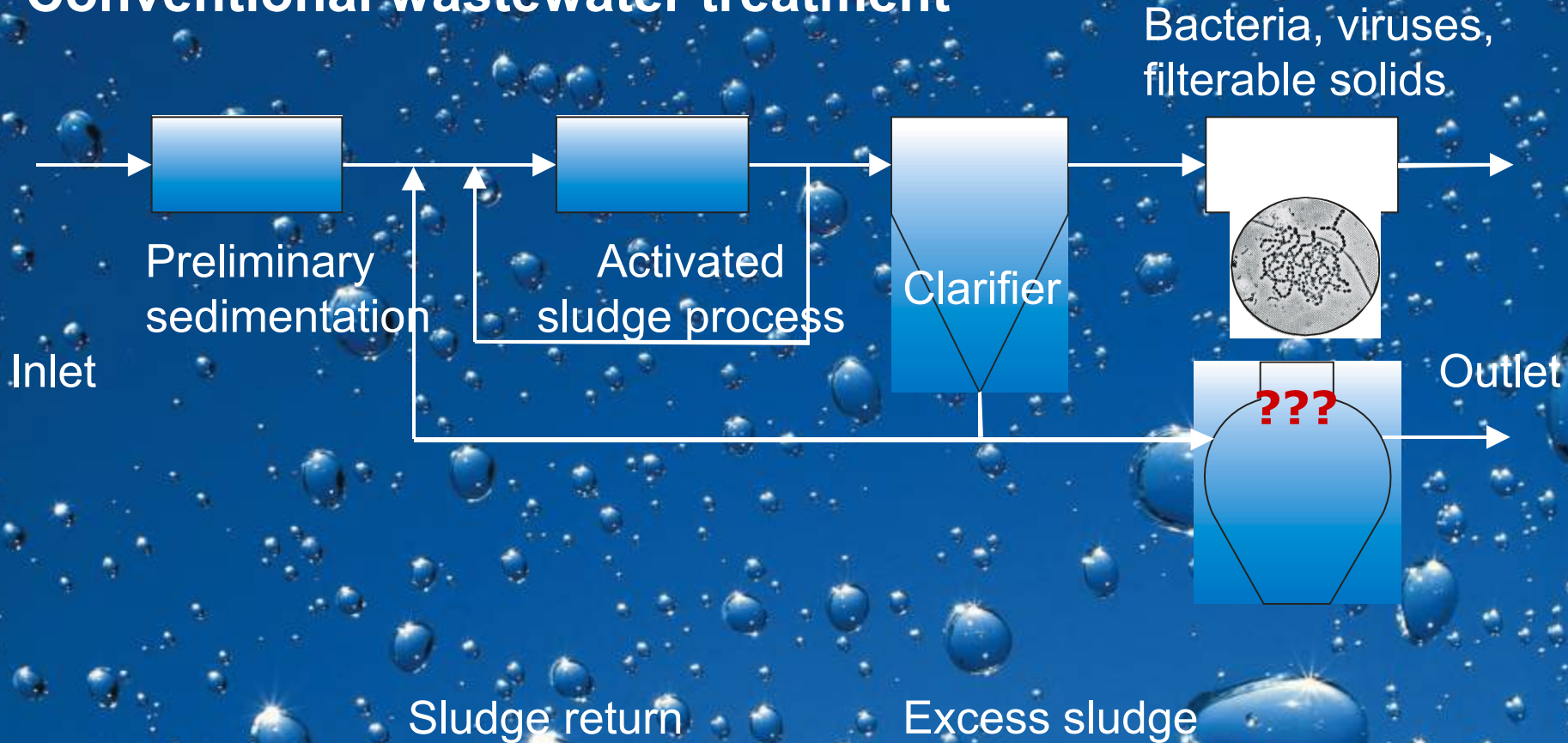


- **Uses an advanced membrane bioreactor filtration technology**
- **Is installed in a garage, shed or in the basement utility room**
- **No excavation or septic tank required, no odors, quiet operation**
- **Ideal for small, difficult and environmentally sensitive sites or near water**
- **Minimal maintenance because the necessity of sludge removal is avoided**
- **Exceeds most county DOH regulatory wastewater reduction limits**
- **The system can be scaled to meet larger flows**

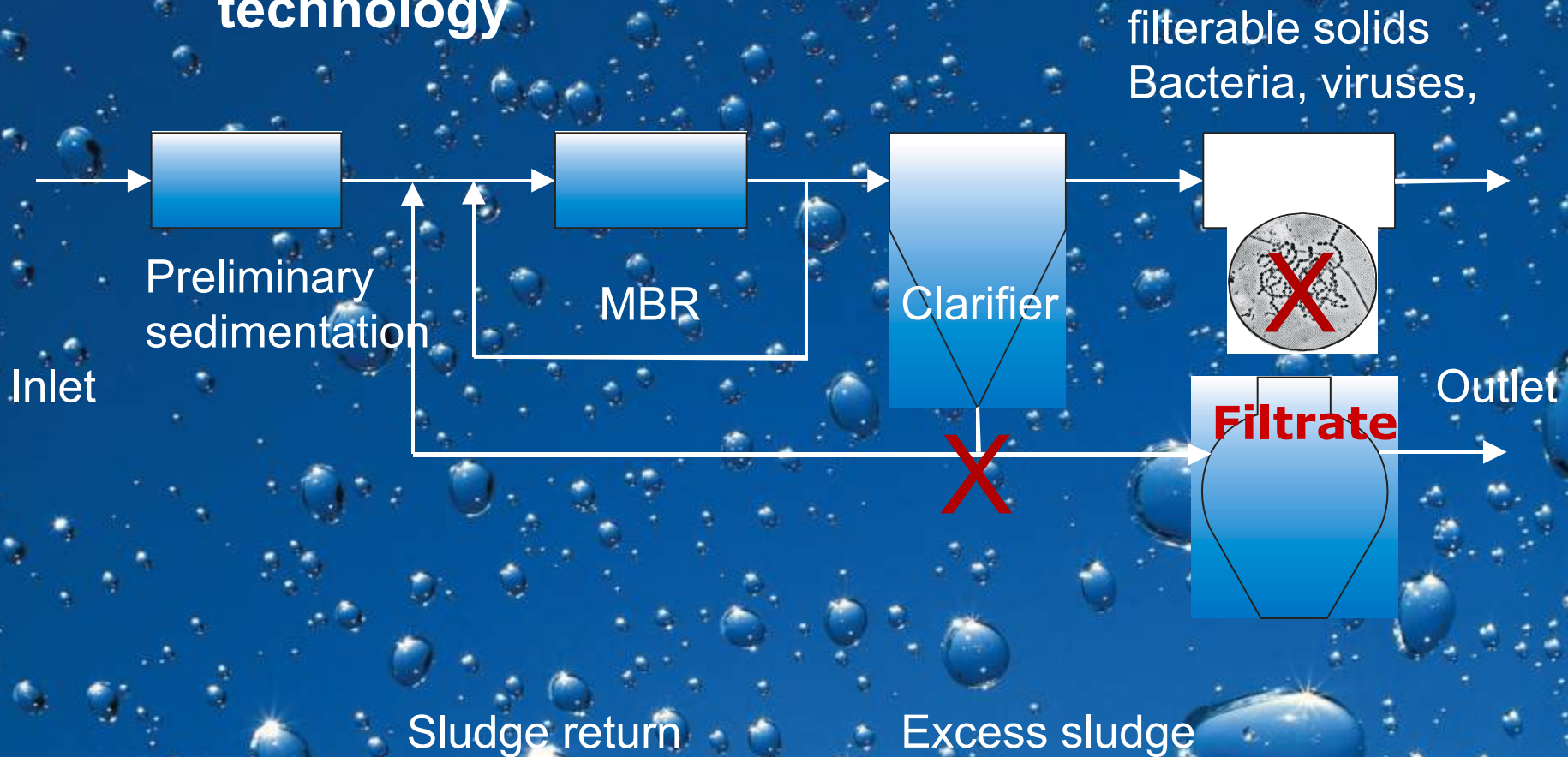
Solution for single-family houses with basement



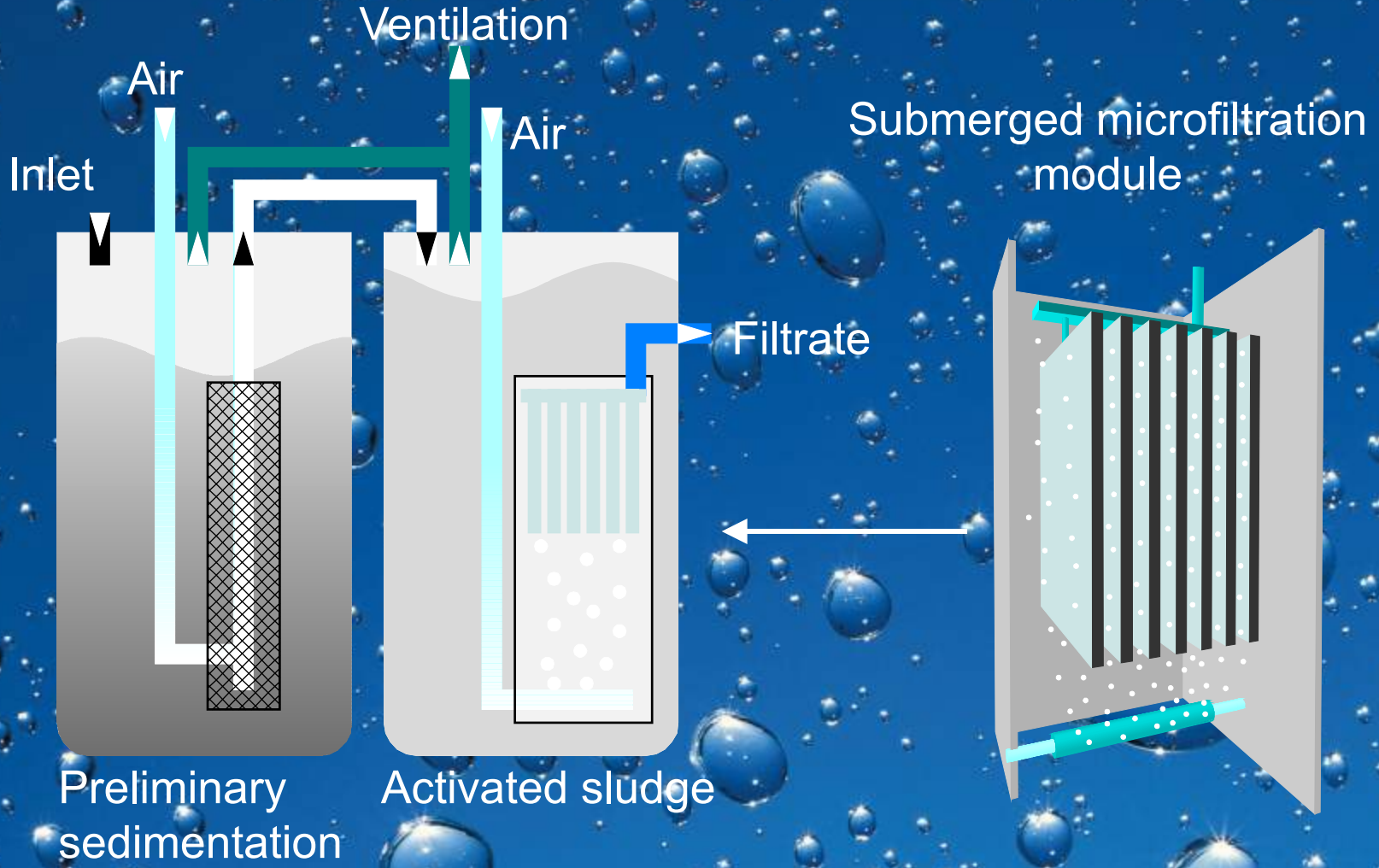
Conventional wastewater treatment



Membrane bioreactor technology



Membrane bioreactor



Advantages of MBR Technology

- MBR treatment is highly effective at eliminating complex bacteria and viruses because the membrane serves as a physical barrier impenetrable to most micro-organisms
- The resulting high biomass concentration in the biological stage improves the biological degradation performance to a very high level
- This restores waste water to hygienic condition for safe disposal (particularly in environmentally sensitive areas or for grey water re-uses where permitted)
- Protection of drinking water resources and eco-system
- BUSSE MBR technology requires less space than other treatment processes ideal for difficult sites
- No additional treatment processes are needed, such as sand filters, clarifiers or chemicals

Local waste water recycling with MBR

The first small scale wastewater treatment system using MBR technology were developed in 1997 by BUSSE in Germany.

Today MBR technology is recognized as one of the most effective means of treating wastewater and is increasingly used all over the world on large municipal systems

BUSSE remains one of the most widely used small and scalable MBR systems available



MINIMAL DRAINFIELD

Because of the high quality of the effluent many states and jurisdictions have allowed BUSSE a greatly reduced drainfield (Some states up to 90%)

Because of this reduction in the disposal area required by most regulatory bodies, a wider range of smaller properties, properties in environmentally protected areas, in canyons, with poor soil for drainage, close to bodies of water and other restricted areas are able to utilize this enhanced MBR treatment option.



WATER TREATMENT TO CLASS A STANDARDS

DIN 47612 & EN 12401 - CLASSES I, II, D, III, IV

Parameter	Result	Units	Method
Biochemical Oxygen Demand (BOD)	5	mg/L	SM 5210 B
Chemical Oxygen Demand (COD)	26	mg/L	Hach 8000
Total Suspended Solids (TSS)	ND	mg/L	SM 2540 D
Turbidity	0.12	NTU	EPA 180.1
E. Coli	ND	Org/100 ml	EPA 9223B
Coliform	ND	mg/L	SM 9223 Colilert
Total Kjeldahl Nitrogen	1.9	mg/L	SM 4500 Norg
Nitrate as N	2.7	mg/L	EPA 300.0
Nitrite as N	ND	mg/L	SM 4500 NO2-B

The newest tested technology will be added to further reduce nitrogen, phosphorus and add mineralization through an RO process

Tested and certified by NSF International 2008, PIA Aachen 2008, TU-Berlin 1999

Busse Next Gen

WATER TREATMENT TO CLASS A STANDARDS



NSF testing at Massachusetts Alternative Septic System Test Centre Barnstable MA



BUSSE

For smaller homes with a 250 GPD flow or less



BUSSE *GT* 250

BUSSE

BUSSE

BUSSE *GT* 500



BUSSE *GT* 500

installed 2002

capacity 500 gal/d

toilet flushing

BUSSE treatment is modular and can be scaled up or down for larger flows, shared /cluster development



BUSSE*MF* 1500

BUSSE *GT* 1500

installed 2002

capacity 1500 gal/d

plant in a camping ground

IDEAL FOR ISLANDS AND AREAS WITHOUT SOIL



Cuckold Island Resort New Hampshire

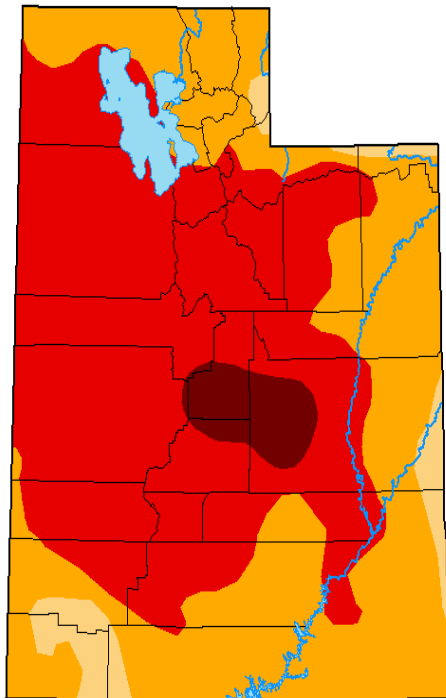
BUSSE *GT* 1000 in a container



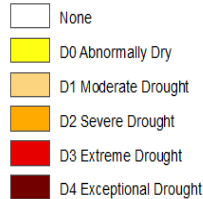
CURRENT DROUGHT CONDITIONS IN UTAH

U.S. Drought Monitor Utah

October 4, 2022
(Released Thursday, Oct. 6, 2022)
Valid 8 a.m. EDT



Intensity:



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

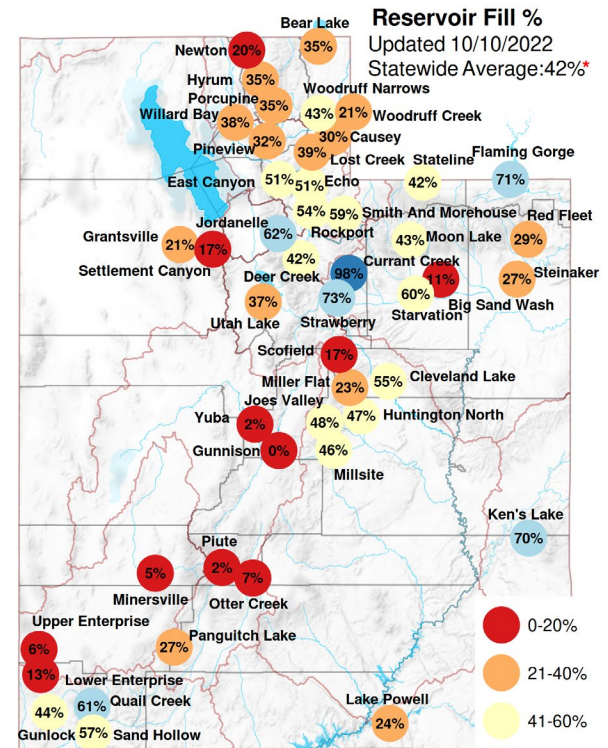
Author:

Brad Pugh
CPC/NOAA



droughtmonitor.unl.edu

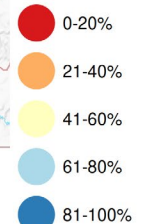
Reservoir Fill % Updated 10/10/2022 Statewide Average: 42%*



Data Sources: water.utah.gov/reservoirlevels

*State average excludes Lake Powell & Flaming Gorge to better represent the state's water supply.

Total capacity including these is 36%



BUSSE WEST,LLC

STATE OF UTAH PROJECTS IN PROGRESS

<u>PROJECT</u>	<u>LOCATION</u>	<u>SYSTEMS</u>	<u>AVAILABLE FOR REUSE</u>
PROJECT ONE	SLC	800 UNITS	146,000,000
PROJECT TWO	DELTA	350 UNITS	63,875,000
PROJECT THREE	TICABOO	1 UNIT	2,737,500
PROJECT FOUR	MOAB	1 UNIT	5,110,000
PROJECT FIVE	KANAB	2 UNITS	12,045,000
PROJECT SIX	BIG WATER	25 UNITS	4,562,500
PROJECT SEVEN	WASHINGTON	275 UNITS	50,187,500
PROJECT EIGHT	THOMPSON	1 UNIT	1,825,000
PROJECT NINE	ST. GEORGE	<u>3,500 UNITS</u>	<u>638,750,000</u>
TOTAL		4,955	925,092,500

TOTAL OF 2,846 ACRE FEET OF WATER WILL BE AVAILABLE FOR EITHER IRRIGATION, RECHARGE OR REUSE EVERY YEAR

Fully Recycled Water



BUSSE

ADVANCED WASTEWATER RECYCLING USING BUSSE MEMBRANE BIOREACTOR TECHNOLOGY

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BUSSE

