

# BAMFIELD WATER TREATMENT PLANT DISSOLVED AIR FLOATATION (DAF)

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# WHAT IS DAF & WHY WAS DAF TECHNOLOGY SELECTED?

- Coagulant is added to the water to encourage suspended solids to bind together to form larger particles (flocculation). These larger particles are then removed after they sink (sedimentation). For low density particles, the process of Dissolved Air Flootation (DAF) can be used in place of sedimentation. DAF introduces a cloud of very fine air bubbles which attach to the floc particles causing them to rise to the surface where they are skimmed off.
- Pilot Study which confirmed that this was the best available technology for Bamfield's water quality.
- Provided the best cost structure for capital and operations.

# OTHER OPTIONS CONSIDERED

## Ozonation

- Ozone is a strong oxidizing gas that reacts with most organic and many inorganic molecules
- It is more reactive than chlorine.
- Since ozone does not produce a disinfecting residual, chlorine is normally added afterwards to provide a protective residual.

## Gravity Filtration

- Biological filtration processes typically follow ozone disinfection and can be one of the most difficult to operate and maintain filtration system.

## Membrane Filtration

- Micro and ultrafiltration membranes have limited ability to remove dissolved organics and the addition of a coagulant may be necessary.
- Inappropriate use of a coagulant can shorten the life of membranes.
- Membrane treatment systems are more technically complex, have higher Capital and O&M costs.

# COST COMPARISONS FOR OTHER METHODS

	Relative Capital Costs	Relative O&M Costs
DAF GF Chlorination	Moderate Moderate Low	Moderate Low Low
Ozone GF (Biological) Chlorination	Moderate High Low	Moderate High Low
GF (Activated Carbon) UV Disinfection Chlorination	High Moderate Low	High Moderate Low
Conventional Treatment MF Chlorination	Moderate High Low	Moderate High Low

# ULTRA VIOLET TREATMENT

PROVIDES AN ADDITIONAL BARRIER OF PROTECTION AT A RELATIVELY LOW COST.

DISINFECTION BY UV RADIATION WORKS BY INACTIVATION OF MICROORGANISMS.

PENETRATES THE DNA OF A MICROORGANISM ALTERING IT SUCH THAT THE MICROORGANISM IS UNABLE TO REPRODUCE.

UV IS MOST EFFECTIVE AGAINST CYSTS SUCH AS CRYPTOSPORIDIUM AND GIARDIA.

UNITS ARE COMPACT AND RELATIVELY EASY TO MAINTAIN AND DO NOT CHANGE THE TASTE, ODOUR, OR COLOUR OF WATER.

IS AN EFFECTIVE, NON-CHEMICAL, LOW COST AND ENVIRONMENTALLY FRIENDLY WATER DISINFECTION TECHNOLOGY. SOME MICROBIOLOGICAL AGENTS OF CONCERN ARE MORE RESISTANT TO CERTAIN FORMS OF TREATMENT THAN OTHERS.

THE BEST APPROACH TO ENSURE COMPLETE DISINFECTION OF WATER INTENDED FOR HUMAN USE IS A MULTI-BARRIER ONE.