



Ontario Fresh Water Supply Co.



Technologies
for All of
Your Water Treatment Needs



Our Purpose

Ontario Fresh Water Supply Co is here to serve communities and businesses .

- The problems of a lack of potable water now are commonplace.

Ontario Fresh Water Supply Co. looks for problems of decaying infrastructure including treatment plants and corrosive pipes leading from the plant.

- Often the problems of municipalities require more than building a new treatment plant. If potable water is produced only to go into a corrosive piping system, there is no benefit to the municipality !





Turn Key Operations Through Co Operation



OFWS provides the Turn Key Technologies that nations require.

We work with governments both federally and provincially providing the latest technology available for each individual project from small to large, from village to many millions of people.



\$ Financing \$



OFWS arranges financing for projects from a million US dollars to 100's of millions of US dollars.

It is **OFWS** responsible to determine, after consultation with the host country, the best water treatment company, or mix of companies, to assist in developing the project.



It is **OFWS**' responsibility to ensure that E.D.C. or C.I.D.A. , the World Bank, or the other potential funds, provide financing for the water proposal, should it be desired by the host government for the Canadian infrastructure required.

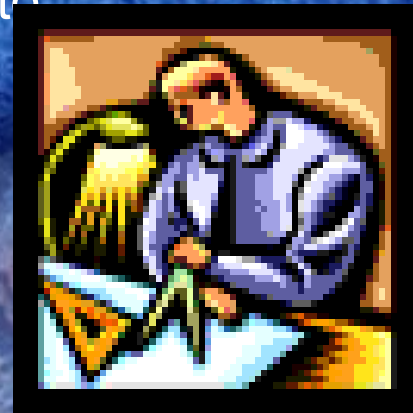




Engineering



- OFWS consultants and engineers work with the major water/wastewater treatment manufacturers of the world to provide quality infrastructure at competitive pricing to accomplish new capital improvements.
- OFWS provides construction using local construction workers native to the host country, following the Canadian guidelines for environmentally proper construction.





Study The Problem



Ontario Fresh Water Supply Co. is prepared to organize a required feasibility study done by a Canadian company in the host country.

This study would determine the size of the project and how to best refer a particular company to the host country .



The Study



Location and Size of the project is determined by the host country .

Once a location is decided upon, a water analysis will have to be taken typical to that site and location.

Areas of consideration should be identified. We may then comment on its location and benefits to serve certain areas.

Methods of treatment can then be considered.





Treatment Methods



CHLORINE - for disinfection

OZONE - for disinfection, removal of heavy metals, arsenic, organic contaminants, colour,

DESALINATION - for salt removal
Reverse Osmosis or Electro Dialysis

SPECIALIZED FILTRATION
- for sediment removal, arsenic removal and some organic contaminants

MOBILE UNITS - for water treatment in remote areas and where permanent installations are not as economical

HYBRID COMBINATIONS

OFWS can provide hybrid systems to suite any water treatment need





Desalination of Water and Sea-Water



The most common treatment processes for removing total dissolved Solids (TDS) from brackish water are

Reverse Osmosis (RO) and Electrolysis (ED) .

RO is a physical process in which contaminants are removed by applying pressure on the feed water to direct it through a semi permeable membrane.



ED/EDR is an electrochemical process in which ions migrate through semi permeable membranes as a result.

* **Desalination Processes**

There is no perfect process that covers all situations. Brackish Water Reverse Osmosis (BWRO), Electrolysis Reversal (EDR), and Seawater Reverse Osmosis (SWRO) are all membrane separation process.





Chlorine



Advantages of Chlorine

- Oxidizes soluble iron, manganese, and sulfides
- Enhances color removal
- Enhances taste and odor
- May enhance coagulation and filtration of particulate contaminants
- Is an effective biocide
- Is the easiest and least expensive
- Is available as calcium and sodium hypochlorite. Use of these *solutions* is more advantageous for smaller systems than chlorine gas because they are easier to use, are safer, and need less equipment compared to chlorine gas
- Provides a residual



Disadvantages of Chlorine

Chlorine forms carcinogens where organics are present !

- Finished water could have taste and odor problems
- Chlorine gas is *hazardous and corrosive*
- Special leak containment and scrubber facilities could be required for chlorine gas
- Typically, sodium and calcium hypochlorite are more expensive than chlorine gas
- Sodium hypochlorite is corrosive and it degrades over time and with exposure to light
- Calcium hypochlorite must be stored in a cool, dry place because of its reaction with moisture and heat
- A precipitate may form in a calcium hypochlorite solution because of impurities... an antiscalant chemical may be needed
- Is less effective at high pH
- Forms oxygenated byproducts that are biodegradable and which can enhance subsequent biological growth if a chlorine residual is not maintained
- Release of constituents bound in the



Ozone Water Purification



Advantages of Ozone

- No chemicals to buy or store.
- Ozone generation requires only electricity.
- Ozone is more effective than chlorine dioxide for inactivation of viruses, cryptosporidium and giardia.
- Ozone oxidizes iron, manganese, sulfides, and organics .
- Ozone can sometimes enhance the clarification process and turbidity removal.
- Ozone controls color, taste, and odors.
- Ozone is one of the most efficient chemical disinfectants because ozone requires a very short contact time.



Disadvantages of Ozone

- Ozone must be generated on-site.
- Ozone is corrosive and requires corrosive resistant materials.
- Ozone decays rapidly at high pH and warm temperatures.
- Ozone provides no residual.
- Upon decomposition, the only residual is dissolved oxygen.





Ozone Applications



- ✓Waste water effluents, Industrial /Agriculture
- ✓Food Industry,
- ✓Domestic/Municipal drinking water,
- ✓Cooling towers treatment,
- ✓Water bottling ,
- ✓Smoke & odour treatment,
- ✓Pulp & paper,
- ✓Boiler water treatment,
- ✓Grain silo disinfecting,
- ✓Semiconductor wafers clean,
- ✓Mining (Cyanide, Arsenic),
- ✓Chilled water treatment,
- ✓Fruit & vegetable storage,
- ✓Laundry water recycling,
- ✓Pharmaceutical,
- ✓Cutting fluids recycling,
- ✓Meat storage,
- ✓Med. instrument sterilization,
- ✓Textile,
- ✓Barn disinfecting (air/water) ,
- ✓Slaughter house disinfecting ,

- ✓Hospital air sterilization,
- ✓Leather,
- ✓Hydroponics,
- ✓Fruits & vegetable wash,
- ✓Aqua-culture,
- ✓Petroleum/Petrochemicals,
- ✓Animal waste treatment,
- ✓Food containers sterilization,
- ✓Paper pulp bleach,
- ✓Waste water effluents,
- ✓Industrial /Agriculture,
- ✓Food Industry ,
- ✓Electroplating Water dripping treatment,
- ✓Wine/Beer SO2 replacement,
- ✓Sour gas desulphurization,
- ✓Heavy metal precipitation,
- ✓Animal drinking water,
- ✓Chicken egg wash,
- ✓Zebra mussels treatment,
- ✓Landfill leachates,
- ✓Irrigation water,
- ✓disinfecting meat grinders,
- ✓Rubber recycling,..... Others, etc.





Ozone Advantages in the Textile Industry

- Reduction in hot water consumption
- Reduction in water/sewage usage
- Less chemical usage
- Shorter drying times
- Labour and time savings





Comparative Analysis of Municipal Drinking Water Treatment Methods



Criteria	Carb. Ads.	Ion Ex.	Dist.	Rev. Osm.	Ultra-Filt.	U.V. Rad.	O ₃	Cl ₂
13								
ESSENTIAL								
Harmful By-Products	NO	NO	NO	NO	NO	NO	NO	YES
Enviro. Impact	LOW	LOW	MED	LOW	LOW	LOW	LOW	HIGH
Bacteria Removal	NO	NO	NO	YES	YES	SOME	YES	YES
Virus Removal	NO	NO	NO	YES	YES	NO	YES	SOME
Lead Removal	SOME	SOME	YES	YES	NO	NO	YES	NO
Manganese Removal	SOME	YES	YES	YES	NO	NO	YES	NO
Iron Removal	NO	SOME	YES	YES	NO	NO	YES	YES
Odour Removal	YES	NO	SOME	YES	SOME	NO	YES	YES
Colour Removal	YES	YES	YES	YES	SOME	NO	YES	SOME
DESIRABLE								
Op. Cost	V. HIGH	MED	V. HIGH	MED	MED	MED	LOW	MED
Capital Cost	MED	MED	HIGH	V. HIGH	HIGH	MED	HIGH	MED
Maintenance	HIGH	MED	MED	HIGH	HIGH	HIGH	MED	MED
Complexity	LOW	HIGH	LOW	HIGH	MED	MED	MED	MED
Hardness Removal	NO	YES	YES	YES	SOME	NO	SOME	NO

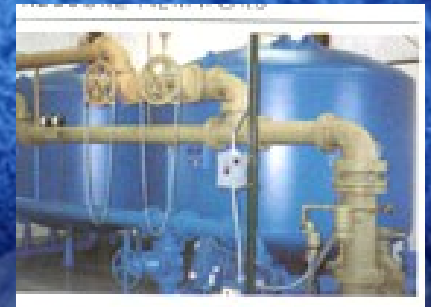


Arsenic and Drinking Water



In 1980 the International Agency for Research in Cancer classified arsenic as an established human carcinogen based on extensive epidemiologic research. Arsenic removal with GFH® Media, a ferric-based media, is used in an adsorption process to remove arsenic and other heavy metals from treated wastewater and drinking water supplies.

- The simplicity of this process with single use media is very attractive for small installations and wellhead applications especially where no treatment currently exists. Pre-oxidation is not required for arsenic removal applications.
- Once the media has exhausted its adsorption capacity, it is removed from the vessel and replaced with new media.
- On larger scale systems ozone pretreatment with biological activated carbon removes 99% of arsenic and iron 99% .





Leather Tanning



- The leather and leather products sector now represents one of the most important industrial sectors, significantly contributing to the national economy .
- Environmental pollution in several tannery areas has reached such proportions that it represents a direct health hazard to the population, and in particular to water supplies for different purposes. Urgent remedial actions are required to reduce the negative impacts on the environment .
- Chrome tanning has, to a great extent, replaced the slow vegetable tanning process. Some tanners still prepare their own chrome liquors from dichromate under poorly controlled conditions.
- Water supplies from hand pumps and tube wells, and foodstuffs produced in the area contain dissolved solids, especially sodium chloride and sulfides.
- The following is the amount of the tannery pollution load discharged (per annum): 4,000 tones of BOD; 11.000 tones of COD; 10,000 tones of SS; 160 tones of Chromium; and 400 tones of Sulfide .

OFWS can provide technologies to alleviate the water pollution hazards associated with tanning processes.



Mobile Units



Hybrid Mobile Units can be made to suite any water treatment need where a number of different contaminants are present in a number of different locations!

The Mobile Unit's equipment is specifically set each time at each location to meet the treatment required for that specific location.

A test for each location is required and should be monitored at specific intervals to ensure that the contaminants are unchanged and that removal requirements of contaminants at that location are being met.





HYBRID COMBINATIONS

Hybrid Combinations of treatment technologies allows OFWS to provide systems to meet any water treatment need where a number of different contaminants are present such as specialized filtration followed by Ozonation followed by RO, etc.

Hybrid processes consisting of Electrodialysis or ED, Reverse Osmosis, offer many advantages over traditional stand-alone applications of these technologies for desalination.

*OFWS combines the best of technologies to give the best results at the best cost!





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Solutions for all of
Your Water Treatment Needs















