

## **CURRICULUM VITAE OF BRUCE JANK**

Dr. Jank is a professional engineer with over 40 years experience in the environment industry. Following his BAsC graduation in 1965, he conducted research at the University of Waterloo's, Water Research Institute leading to a Ph D in environmental engineering in 1971. He spent a year as an Assistant Professor, Department of Civil Engineering, University of Waterloo and a year as a project engineer in the Environmental Engineering Group with Acres consultants, Toronto. He joined Environment Canada's Wastewater Technology Centre (WTC) in 1973 and during his 25 year tenure was a Division Manager, the Director of WTC and CEO of Water Technology International, the contract operator of the privatized government research centre.

As Manager of WTC's Biological Processes Division, he conducted an extensive program on the design and optimization of nutrient removal systems focusing on both nitrogen and phosphorous removal. Pilot plant and full scale systems were designed and evaluated originally for municipal wastewater and then for industrial wastewaters. Following the development of automated control systems for the nutrient removal systems, the emphasis shifted to applying the automation technology to all wastewater treatment plants.

The first plant that was fully automated was the Tillsonburg, Ontario, WWTP. The fully automated plant achieved complete nitrification with 50% of the plant shut down and as a result, a \$10 million plant expansion was deferred for at least 20 years. The next plant studied was the Kitchener WWTP where a \$20 million expansion was deferred for at least 10 years by correcting design deficiencies and installing a computer control system at a total cost of \$500,000. Over 40 plants were evaluated using the process audit techniques with a projected capital cost saving for Canadian plants of \$1 billion.

The process audit approach provided a unique capability for optimization of design and operation of new wastewater treatment plants and as a result, WTC participated in the process selection, detailed process design, supervision of construction and start-up of the Banff WWTP. WTC had a contract to operate the Banff treatment plant for the initial six years of operation.

Dr. Jank lead the selection of appropriate technology for the Municipality of Jasper's new wastewater treatment plant. The involvement with Jasper was initiated when the Wastewater Technology Centre selected a biological nutrient removal system incorporating tertiary treatment for the Columbia Icefields seasonal resort facility. The resulting working relationship with Jasper National Park led to the identification of a design/build/operate approach for the Jasper wastewater treatment plant.

Jasper National Park working through Public Works Canada had utilized the standard design approach to select an appropriate plant design which established a reference level for the capital costs and the O&M costs. Dr. Jank participated in the establishment of

effluent objectives for the Mountain National Parks, which ultimately became the effluent objective which the Municipality of Jaspers wastewater treatment plant was to achieve. These limits were more stringent than those used by the consulting engineering firm retained by DPW to establish a design for the Jasper WWTP. By implementing the design/build/operate concept the capital cost were reduced from approximately \$16 million to \$10 million and the operating costs by approximately \$2 million over the 20 year life of the operating contract. The estimated capital cost of \$16 million for the original DPW design did not include flow equalization, lagoon restoration, appropriate sludge management, employee housing, etc. The liquid treatment system selected is a state-of-the-art biological nutrient removal system. The sludge management system selected incorporates some unique features which should result in significant capital and operating cost savings for most municipalities' sludge management facilities.

The techniques developed for Jasper were subsequently used for a design/build contract for the District of Squamish, British Columbia. This contract utilized an activated sludge process with a reactor configuration similar to the Jasper WWTP to eliminate one plant and double the capacity of the second wastewater treatment plant.

Dr. Jank participated as a technical advisor for the design/build/operate (DBO) contract for the treatment of metal contaminated mine water being discharged into Howe Sound at the closed Britannia copper mine site. The technology selection for this site was based on the assessment of three process designs submitted by three proponents. Process viability and the life cycle cost analyses were used as the basis for selection of EPCOR as the successful proponent for this DBO contract. The physical-chemical treatment plant was placed in operation in 2005.

Dr. Jank has also provided technical advice to the Town of Canmore, AB, for their treatment plant upgrade identifying significant savings in both liquid and solids train expansion. He has provided technical advice to the Town of Chestermere, AB, on water supply and wastewater collection and disposal issues. He has also been retained by the Town of Strathmore, AB, to provide a process design and cost estimate for a wastewater treatment plant expansion. He prepared the documentation for their successful CAMRIF submission and is now serving as Technical Advisor on a design-build contract which will result in a tripling of the capacity of their WWTP.

The most recent design/build/operate project was the Town of Okotoks wastewater treatment plant upgrade. Using the traditional design approach, the capital cost was estimated to be \$24.2 million for a build-out population of 30,000 in the year 2014. Following a site inspection, Dr. Jank recommended an appropriate alternate design to build-out with a capital cost estimate of \$10 million. The Town of Okotoks proceeded with the recommended design/build/operate option and within 7 months signed a \$11.2 million contract for provision of services for the 30,000 population build-out.

Because of the success of the Okotoks project, Dr. Jank has been retained by the Town of Taber to select the technology which will be used to upgrade their wastewater treatment

system. By selecting a more appropriate technical solution for their domestic and industrial wastewater treatment system, Taber will spend approximately \$14.5 million for a plant that the consultants had estimated would cost \$28 million. The 50% savings have been achieved through appropriate technology selection, improved structural designs and modifications in project scheduling. The Town of Taber's plant inspection and the discussions with representatives of the Town of Okotoks were significant factors in the Town of Taber's decision to adopt the design/build/operate strategy for their plant expansion.

Dr. Jank has also been retained by the Capital Regional District, the City of Victoria, and is assisting them in the selection of appropriate technology for their secondary treatment system. Conceptual designs for their plant or plants were submitted in June, 2007. There are a number of unique environmentally sustainable communities being developed in the Capital Regional District, and Dr. Jank has been asked to provide consulting services on several of these projects. The Westhills Community, a new community being developed for a population of 20,000 residents is an excellent example of the creativity that can be incorporated into an environmentally sustainable community. He has also served as a technical advisor for the B.C. Ministry of Community Services' project to develop an "Integrated Resource Management Strategy" for water, wastewater, biosolids and municipal solid waste management. As well as focusing on wastewater reuse, stream augmentation and aquifer recharge, the IRM strategy incorporates geoexchange for heating and cooling, and would ultimately eliminate the requirement for landfills by processing the wet organic and dry organic fractions generating vehicular fuel and electricity.

As CEO of Water Technology International, Dr. Jank realized the importance of a Canadian delivery capability for the design/build/own/operate option for water and wastewater treatment systems. He worked with the Regional Municipality of Hamilton-Wentworth to create the public private partnership which culminated in the 10-year, \$186 million contract issued by the Region to Philip Utilities Management Corporation. He worked with PUMC as their Senior VP Technology for a period of 6 months.

Water Technology International placed significant attention on the development and demonstration of technologies for pollution prevention / product recovery. Industrial waste auditing procedures were developed to identify product recovery / reuse opportunities aimed at minimizing waste generation in the most cost-effective manner. Auditing was followed by full-scale implementation of innovative technologies in the metal finishing, automotive, printing and graphic arts, base metal mining, textile, food and beverage, pulp and paper, iron and steel, petrochemical, fertilizer, organic chemical, inorganic chemical and transportation sectors.

Water Technology International established offices in the United States, Mexico, Egypt, and Poland for the delivery of Canadian technology to the international market. Through these offices, Dr. Jank participated in the development of industrial source control programs in United States, Mexico, Central and South America, the Caribbean, Poland,

Egypt and Jordan. Emphasis was placed on offsetting capital and operating costs by the value of product recovered, the reduction or elimination of sewer surcharges, the control/elimination of toxic wastes at source and the reuse of treated wastewaters as industrial process waters.

Dr. Jank has authored or co-authored approximately 100 publications and has contributed to numerous technical reports and presentations. One of his major research areas was the development, optimization and full scale demonstration of nutrient control systems. All aspects of nitrogen and phosphorus removal were investigated with emphases on the selection of least cost nutrient removal options. His contribution included a chapter in a textbook on the "Design of Oxidation Ditches" and a chapter in WPCF's "Facilities Design Manual of Practice FD-7, Nutrient Control".

Dr. Jank is past chairman of IWA's specialist group on Instrumentation Control and Automation and one of the founding members of the Water and Wastewater Instrumentation Testing Association of North America (ITA). He was the conference chairman and editor of the proceedings of the 6<sup>th</sup> Workshop on Instrumentation, Control and Automation of Water and Wastewater Treatment and Transport Systems, IAWQ-WST/Vol. 29/12.

In October of 1997, Dr. Jank established Canadian Global Environmental Technologies, a company assisting in the marketing of Canadian technologies in the international market. The company focuses on the marketing of innovative water and wastewater treatment technologies and industrial source control technologies. The company also provides support to privatization in the municipal and industrial sectors.

The following represent projects which Dr. Jank has worked on recently.

- Strategic planning initiative for the Regional Municipality of Hamilton-Wentworth. The objective was to determine how projected costs for combined sewer overflows and wastewater treatment could be reduced to levels that the Region could afford. Substantial reductions in projected capital costs have been identified by effectively using the existing infrastructure.
- Technical assessment of process design and system performance for DuPont's Maitland operation. The study proved that the pre-denitrification/nitrification system represented best available technology economically achievable (BATEA) for this organic chemicals plant and no further expansions were required at the plant.
- Participation with the Instrumentation Testing Association of North America, Henderson, Nevada, in a Water Environment Research Foundation contract to establish guidelines for incorporating redundancy in the design of North American wastewater treatment facilities.
- Prime consultant in a 2002 Environment Canada contract to estimate the costs required to upgrade/rehabilitate/expand Canada's wastewater treatment plant infrastructure.

Dr. Jank's efforts continue to focus on the retrofit and upgrade of existing infrastructure using techniques that defer major capital expenditures. He is presently using these techniques to support the development of Foundation Capital's new environmentally sustainable communities that will become the leaders in the environmental conservation and environmental stewardship.

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