

ALBERTA



UTILITY OPERATOR

NEWSLETTER

FALL 1999 - NUMBER THREE

FEATURE FACILITY:

Town of Magrath Dissolved Air Flotation Plant

By Karrie Petz, P.Eng. & Peter Brouwer, P.Eng., MPE Engineering Ltd.

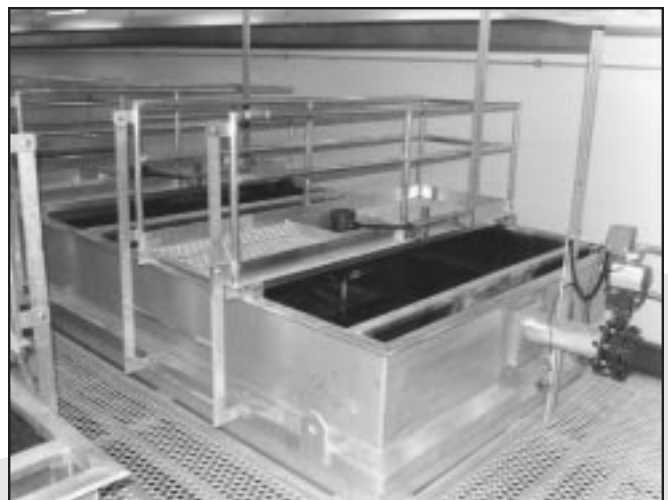


DAF PLANT UNDER CONSTRUCTION

INTRODUCTION

The Town of Magrath is located approximately 35 kilometres south of Lethbridge. Magrath currently has a population of about 1,800. The Jensen Reservoir, 1.6 kilometres south of Magrath, supplies the Town's raw water. Jensen Reservoir is located in the Pothole Creek drainage basin, which consists of 100 square miles of pasture used for cattle grazing. Two thousand head of cattle water from the reservoir year round. Between May and October, the reservoir is supplied with Saint Mary and Waterton River water from the main canal. A 450mm-diameter supply line runs from the Jensen Reservoir to the Magrath Water Treatment Plant.

The raw water quality is normally good. However, during the spring runoff, spring rainstorms, and charging of the main canal, the water quality in the reservoir declines and becomes more difficult to treat. During this season, raw water turbidity can range from 5 to 80 NTU, colour can be between 5 and 80 TCU and the total organic carbon (TOC) levels can exceed 10 mg/L. Consequently, the Chinook Regional Health Authority has issued boil orders for the Town of Magrath in March of 1996 and again in the spring of 1997.



CHEMICAL ADDITION AND MIXING END OF TRAIN #2

Historical water consumption records for Magrath indicate an average daily demand of 925 Lpcd (Litres per capita per day) and a maximum daily demand of 2,100 Lpcd. Five water co-ops serve an additional 300 people neighbouring the Town of Magrath.



CONTROLS AND PUMPING

ORIGINAL PLANT

The original treatment facility was constructed in 1983 and consisted of an in-line gravity filtration system with coagulant addition immediately before the filters, and pre and post chlorination. There were two gravity filter units; each contained two separate filter cells. Each filter unit has a backwash water storage compartment located above the filter for gravity backwashing of the filter media. The treated water was stored in an above ground tank and was distributed to the town through a gravity supply line with a pressure reducing station at the townsite. Over the past few years the Town has had difficulty meeting the current Alberta Environmental Protection standards for turbidity removal during the spring runoff and storm events using this treatment system.

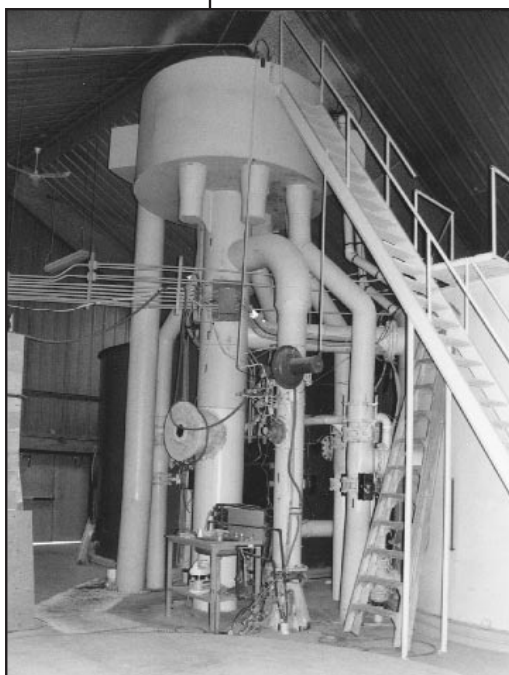
PILOTING STUDIES

The turbidity problem in the spring of 1996 prompted an investigation into the existing water treatment process. The first study was conducted in 1996 to address the immediate concern of providing a reliable potable water source. Interim recommendations included optimizing the media design and chemical doses, incorporating air scour into the process, increasing the filter backwash rate, and incorporating on-line turbidimeters into the system. These measures were implemented to help optimize the existing treatment system until further investigation could be completed to determine a long-term solution.

DESIGN CRITERIA

Design began on the addition of a DAF pretreatment plant as well as the upgrade to the water treatment plant in 1998. The previous studies had concluded that the existing filters could be maintained with some remedial work. Flocculation and dissolved

air flotation were required before the filtration process to produce a more filterable floc to reduce the burden on the filters and, in fact, increase the allowable filtration rate. The parameters for the DAF design were based on the piloting results. The DAF design concept is presented in Figure 1. The overall water treatment design also incorporated the Town's operational concerns, including economic constraints, ease of operation, addition of controls for the various processes, and the continued use of gravity flow.



FILTER BACKWASH TANK AND CONTROLS

If the DAF plant were added on to the existing treatment plant, the DAF effluent would have had to be pumped to the top of the existing splitter box. Since this was undesirable, and since the entire facility operation was conducive to gravity flow, it was concluded that the flocculation and DAF system would be best situated uphill from the existing plant. The selected site for the DAF plant was 500m south of the existing building and 8m higher.

Since the existing system had little in the way of controls and monitoring equipment, the new plant and upgrade would include a complete automated controls package to increase the operator's efficiency and level of information. Essentially, the operation of the water treatment system would be controlled by the amount of treated water in the storage tank. Each component of the treatment system would be interdependent on the next, so that each process would be controlled by the previous process. This would be accomplished using flow meters, indicators, and flow control valves throughout the design. Monitoring equipment would also be incorporated into the system to confirm water quality at each process component. Ultimately, the entire DAF plant would be able to be controlled remotely from the existing water treatment plant and vice versa.

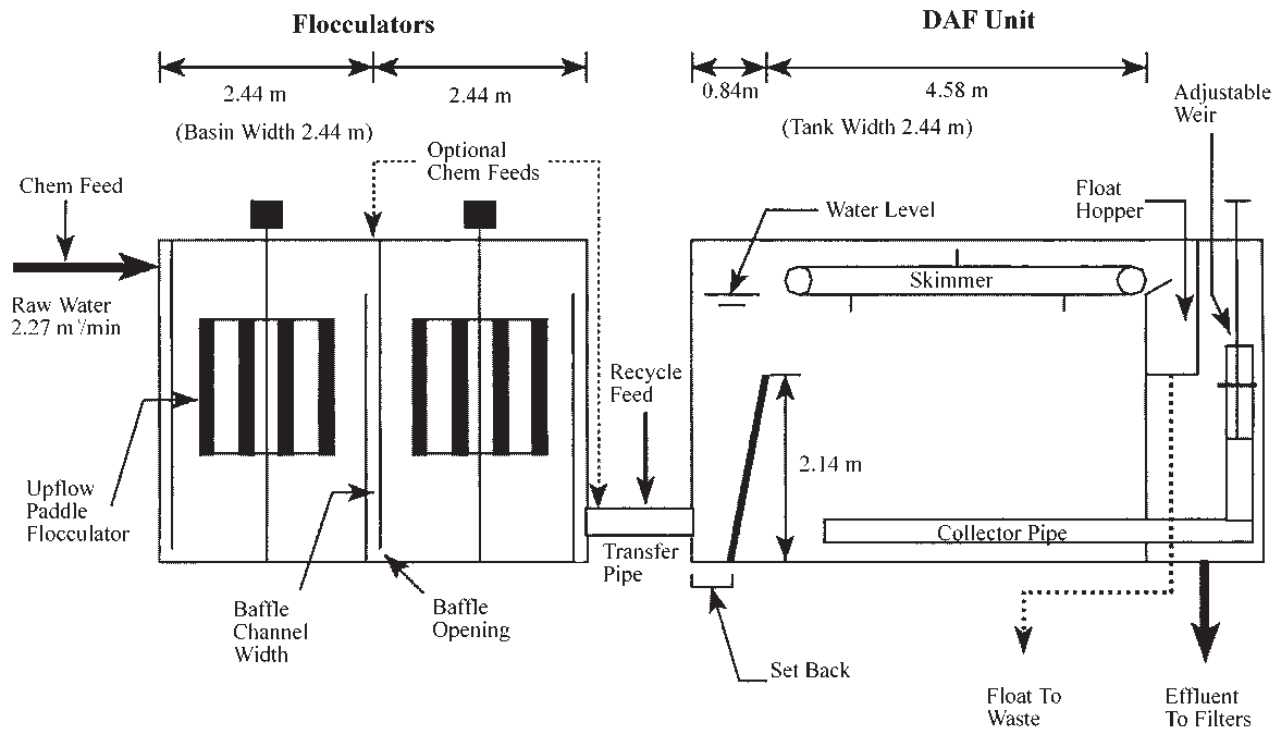
SUMMARY

Construction of the DAF plant and the water treatment plant upgrade began in April of 1999 and was completed in the fall of 1999. The DAF system is currently being commissioned, and will be available for the spring runoff in April 2000.



CONSTRUCTION PROGRESSES

Schematic of Design Criteria



PERSONAL PROFILE SCOTT CHANT

Town of Nanton



G'D DAY EH

Scott Chant was born in Leeton, New South Wales, Australia. He grew up on the family farm where they grew rice and raised sheep and cattle. In 1984 at the age of 19, Scott came to Canada by himself on a farm exchange program. After surviving the first winter, which he mentions was severe, he decided to stay on for a couple of years in the farming industry. For the next few years Scott worked for the MD of Acadia for the recreation board and also "got a taste of the water and sewer business".

In 1990 Scott became the Town Foreman for the Town of Barons where he worked for the next five years. In June 1991 he started on obtaining certification. Scott then moved to the Town of Nanton in 1994 to become their Utilities Operator. Since then he has obtained certification at Level II in Water Treatment, Water Distribution, Wastewater Collection, and Wastewater Treatment.



THE CONTROL CENTRE

The Town water supply comes from two sources. The main supply is from a spring from which water is pumped to the water treatment plant and is disinfected with chlorine gas. The "backup" system draws water from mosquito creek, which goes through full conventional treatment and gas chlorine disinfection. Wastewater from the Town is treated at the Pollution Control Centre using air drive rotating biological contactors, clarification, aerobic digestion and a polishing pond. Scott does all of the laboratory testing for the facility as well as weekly analysis for the Town of High River.

Scott wears a number of hats in the Town of Nanton. For the last year he has also been working as an Emergency Medical Technician for the Foothills Regional Emergency Medical Services, working 10 to 14 twelve-hour shifts per month. He is also a Captain of the Town of Nanton volunteer fire department as well as the Safety Codes Officer and the licensed pesticide applicator for the Town.



Scott says he has enjoyed the challenges of working in a larger community. He has been able to learn new skills and the variety and challenges have been great. Another challenge for Scott has been running for election to the AWWOA and being voted in this spring. His work is cut out for him as he is working on the annual election nominations committee.

In his "spare time" Scott is a cub/scout leader and keeps involved with soccer activities. He has two children, a boy 10 and a girl 12. They enjoy water-skiing, downhill skiing and Scott has even tried his hand at snow boarding. Scott still likes to help out on the farm in the spring and fall.

AWWOA Chairman's Report

by Mike Pelletier

I hope that everyone had a wonderful summer and that you are now geared up and ready for winter. So far, in the northern part of the province we have nothing to complain about.

I thought I'd touch a little on the Association activities this year. We've been hearing over the past few years about the restructuring of the Western Canada Water & Wastewater Association. The WCWWA will be entering the first year of the new structure in 2000 and we are co-operating wherever possible to make this a successful transition.

As we all know the major focus for the AWWOA is the training of the operators. We came to some decisions this past year and appointed a committee to look at the training material that is out there for the Level III and IV operators in the province. From this came the development of resource study maps. These were developed to give an operator a reference to where material could be found. Although this serves a useful purpose the amount of information that a Level III and Level IV operator requires has to be currently obtained from various manuals and resource books. The direction taken this year was to develop condensed course material in a complete package through the Southern Alberta Institute of Technology (SAIT) which would act as an advanced treatment program. The committee this year has been given the direction to explore this advanced education route. I feel that this will elevate the learning at upper end of our profession and give more recognition within the industry. The resources needed for this undertaking will be larger than we, as an Association, have committed in the past. This undertaking will require co-operation from other organizations and several years to implement. This will be at the forefront of the training committee's agenda for the next few years. As developments occur, the information will be shared with the membership.

Plans are well underway for the 2000 Annual Seminar, which will be a little extra special as it is the 25th Annual Operators Seminar. Hope to see you there.

Your Chairman

Mike Pelletier

ALBERTA WATER AND WASTEWATER OPERATORS ASSOCIATION

NOTICE OF MOTION

Proposed Bylaw Changes

The following are the proposed changes to the AWWOA Bylaws, which will be discussed at the Annual General Meeting in March 2000, at the Annual Banff Operators Seminar.

These changes/additions are highlighted in **bold** and will read as follows:

D iia.

A letter ballot plainly marked Vice Chair shall be mailed to the Vice Chair at the same time all ballots are mailed to the membership. This ballot is to be opened by the scrutineers in case of a tie vote with only that portion pertaining to the tie vote being counted.



NOVEMBER AWWOA EXECUTIVE MEETING

CANDIDATES NEEDED

The AWWOA election is approaching. Positions in all population categories as well as private industry are open. Any member in good standing may run. If you want to be actively involved in the nuts and bolts of the Operator's Association, contact Jim Hepler at (780) 987-3415, Fax (780) 987-3227, or Scott Chant at (403) 646-2902, Fax (403) 646-2653.

OPERATOR TRAINING COURSES – 1999/2000

To register for any of the Alberta Environment/AWWOA sponsored courses listed below please complete the application form in the 1999/2000 Training Brochure. Additional information on the courses and the application for training is also available at the AWWOA website at: www.awwoa.ab.ca. Return the application, along with the registration fee, to the address indicated on the form. If a purchase order is being used please allow sufficient additional time for processing. In cases where more applications are received than can be accommodated, they will be accepted on a first received basis.

COURSE	LOCATION	DATES
Hydrant & Valve Seminar	NAIT	December 15 & 16, 1999
Iron & Manganese Control Course	Red Deer	January 25 & 26, 2000
Management & Supervision for Operators	Edmonton	February 15 - 18, 2000
Level II Certification Preparation Course	Edmonton	March 1 & 2, 2000
Alberta Operators Seminar	Banff	March 7 - 10, 2000
Chlorination Workshop	Calgary	April 11 – 14, 2000
Level I Certification Preparation Course Part "A"	Edmonton	April 4 & 5, 2000
Level I Certification Preparation Course Part "B"	Edmonton	May 16 & 17, 2000
Small Water Systems Course	Edmonton	April 26, 2000
Small Wastewater Systems Course	Edmonton	April 27, 2000

Correspondence/Homestudy Course

- Level I Certification Preparation Correspondence
- Level II Certification Preparation Correspondence
- Small Water System Homestudy Course
- Small Wastewater Systems Homestudy Course
- Wastewater Treatment Operations "A" Homestudy Course
- Wastewater Treatment Operations "B" Homestudy Course
- Rotating Biological Contactor (R.B.C.) Homestudy Course
- Pumps; Theory, Operation & Maintenance Homestudy Course

**HOT OFF THE
PRESSES!!
GET YOURS NOW!!**

The much sought after AWWOA "Operator Handbooks", that were available to 1999 Seminar attendees have been reprinted and are now available for Sale, for the low, low price of \$7.00 each. To order yours, please contact Terry Chapman at:

Alberta Water and Wastewater Operators Association
P.O. Box 34010, 196 A Kingsway Mall PO
EDMONTON, AB, T5G 3G4

LEVEL 3 & 4 STUDY MAPS (where to find the material to study for certification exams)

The AWWOA level 3 & 4 certification study maps for water treatment, water distribution, wastewater collection and wastewater treatment are now complete. The Maps are a bit behind schedule but as soon as a few technical details are remedied they will be available on the AWWOA Web Site. They should be available by the end of this year.

LEVEL 3 & 4 STUDY MATERIAL

The AWWOA is presently working with SAIT to develop a series of study packages to be used in conjunction with the Level 3 & 4 Study maps to assist operators in preparation or the certification exams. Stay tuned for further information.

ALBERTA LANDFILL OPERATOR TRAINING COURSE

Plans are being made by the SWANA¹ Canadian Prairie Chapter and NAIT² to deliver a spring session of the Alberta Landfill Operator Training Course during late January – early February, 2000. The course will provide the basic information necessary for a landfill operator to properly operate any Class II or Class III landfill facility. The course is also intended as preparation for the Municipal Waste Management Facility Operator Certification exams administered by Alberta Environment.

The 2-day course consists of classroom presentations, a field exercise component, and a training reference manual (developed by SWANA) which the candidate keeps. The course outline includes an Introduction to Sanitary Landfill Operations, Leachate Management, Landfill Gas Management, Landfill Safety, Equipment Care and Maintenance, Litter Control, Special Operating Concerns, Spotting and Waste Screening, Cell Construction & Compaction, Gate and Scale House Operation, and Groundwater Monitoring. Course fees (\$300 for SWANA members & \$400 for non-SWANA members) include course materials and lunch on both days.

For more information, please contact Dr. Bruce W. Taylor or Sue McGuinness at (780) 496-6871.

¹Solid Waste Association of North America

² Northern Alberta Institute of Technology

IRON AND MANGANESE CONTROL COURSE January 25 & 26, 2000 Red Deer, Alberta

This course is intended to assist the operator with the operation of Iron and Manganese removal/control facilities. The reference manual for this course was originally prepared for Saskatchewan Environmental Resource Management by Reid Crowther and Partners Limited and Anthratech Western Inc. Candidates should be working in a facility that incorporates iron and manganese removal.

MUNICIPAL WASTE MANAGEMENT FACILITY OPERATOR CERTIFICATION FOR COMPOST FACILITIES

Olds College will be offering a 3-day tutorial highlighting the new requirements for the Compost Class I and II A & B Facilities. This tutorial will cover all of the competencies required for the Certification exam. Contact Alberta Environment directly to obtain applications for certification examination. To register for the 3-day tutorial contact Olds College at 1-800-661-6537.

3-Day Tutorial: May 16 – 18, 2000

Cost: \$499 Early Bird Fee (includes study guide)
\$550 after May 2, 2000

Competencies Covered include:

Feedstock Management, Health and Safety, Site Management, Regulatory Compliance, Chemistry, Ecology, Equipment Operation, Quality Control, Information Management, Communications, Public Relations, and Marketing.

The cost of the course is \$170.00 (GST included). For a course application form check out the AWWOA website at: www.awwoa.ab.ca. or Contact Del Morrison at (780) 427-8130.

Course Outline:

- Basic Chemistry
- Basic Microbiology
- Basic Mathematics
- What is Iron and Manganese?
- Pre-treatment
- Filtration
- Alternate Technologies
- Pilot Studies

25th ANNUAL ALBERTA WATER & WASTEWATER OPERATORS SEMINAR

The Registration packages for the 2000 Alberta Operators Seminar, March 7 – 10, 2000, will be mailed to all Alberta Water and Wastewater Operators Association members, all certified operators, and all municipalities at the end of December. An added benefit to attending the Operators Seminar will be an AWWA Teleconference – at a reduced price. The teleconference will be on “Taste and Odour Control For Drinking Water”. Watch your mailboxes!! If you don’t receive yours by January 15th, contact Kathy Abramowski at (780) 427-7713.

UNEMPLOYED? Looking for New Employees? Looking for Work in the Water or Wastewater Industry?

The Alberta Water and Wastewater Operators Association will allow you to place a “seeking employment” or “job available” advertisement on the AWWOA website at no charge for AWWOA members. Please contact the webmaster at webmaster@awwoa.ab.ca.

AWWOA MEMBERSHIP RENEWALS

Watch your mail boxes in December for your 2000 AWWOA Membership Renewal. Your renew will be processed by the *Western Canada Water and Wastewater Association*.

Questions concerning your membership can be directed to Audrey at the Western Canada Water & Wastewater Association office at toll-free, 1-877-283-2003 or (403) 283-2007.

MEMBRANE TECHNOLOGY SEMINAR

The Alberta Provincial Council is organizing a Membrane Technology Seminar to be held in late January 2000 in Calgary. Keep your eyes peeled for a detailed registration form to be mailed out soon.

The Alberta Utility Operator is published three times a year by the Municipal Program Development Branch of the Environmental Sciences Division, Alberta Environmental Protection, as a means to exchange information for those involved in the operation of water and wastewater facilities. The contents do not necessarily reflect official opinion or policy and, unless otherwise stated, should not be construed as policy or regulations. **The Alberta Utility Operator** and Alberta Environmental Protection allow the Alberta Water and Wastewater Operators Association to publish noteworthy information in this newsletter, however, we cannot be held responsible for the accuracy of information submitted. Contributions, comments and criticisms are welcome.

ALBERTA UTILITY OPERATOR
MUNICIPAL PROGRAM DEVELOPMENT BRANCH
ENVIRONMENTAL SCIENCES DIVISION
ALBERTA ENVIRONMENTAL PROTECTION
5th Floor, 9820-106 Street
Edmonton, Alberta T5K 2J6