

ALBERTA



UTILITY OPERATOR

NEWSLETTER

WINTER 2001 - NUMBER ONE

FEATURE FACILITY: The Town of St. Paul Water Treatment Plant



ST. PAUL WATER TREATMENT FACILITY

The Town of St. Paul is located on Highway 28, approximately 210 kilometers northeast of Edmonton. St. Paul currently has a population of about 5000 and is a major service centre for the area.

Lac St. Cyr is the raw water source for the town, however the lake level is stabilized by pumping from the North Saskatchewan River between November and February each winter. Two 80 horsepower National pumps move the raw water from Lac St. Cyr to the lined 22.7 ML raw water reservoir at the treatment plant. The treatment plant is approximately five kilometres southeast of town.

The new treatment facility was constructed after considerable review of the options available, as well as extensive pilot testing. The University of Alberta and the Town Engineer, Mr. Matt Matatko, M. Eng., P. Eng. decided on the treatment regime after approximately two years of study. Major objectives to be met were organics removal, destruction of any herbicides, pesticides and algal toxins by advanced treatment, at comparable cost to conventional treatment.

Water from the raw water reservoir flows by gravity into the plant where pH is lowered, using acid to ensure ozone reaction by molecular pathway in a pre-ozonation contactor. The first stage ozonation kills algae and preconditions the water for coagulation. Ozone is only added up to 0.5 mg/L so that the algae cells are not



L to R: ROY LAIDLAW, ERNIE FORMANEK, MATT MATATKO

ruptured and can be removed efficiently. Ozone is produced from liquid oxygen in a Wedco model GS100 dielectric tube generator capable of 100 pounds per day at 10% by weight. Ozone destruct units remove any "off gas" from the system.

From the first stage ozone contact reservoir, water is conditioned with coagulant in the flash mixer. Then conditioned water flows into the 123.7 m³ dissolved air flotation clarifiers. A portion of the effluent from the DAF clarifiers is recycled through an air compressor fed saturator to ensure constant saturation of the water. Solid material (floc) is floated off and the clear water flows on for further treatment.

At the second stage of ozone treatment the pH is adjusted up and hydrogen peroxide is added to create the radical pathway reaction of ozone. This unit involves advanced oxidation process (AOP) to further chemically degrade organic material. The water is then passed through the mixed media filters. The media consists of 45 cm of 0.35 to 0.45 filter grade sand covered by 45 cm of #1 grade anthracite. Filtered water is then either processed further or is used to fill the backwash water reservoir. Chlorine is not added at this point as the backwash water is used for cleaning the biologically active granular activated carbon filters.

The next process stage is the last (third) stage of ozonation. pH is once again adjusted to achieve the molecular pathway reaction of ozone. This unit is specifically designed as primary disinfection unit with the purpose of destroying or inactivating viruses, cryptosporidium, giardia and other water born pathogens. Sodium metabisulfate is then used to



OZONE RESIDUAL SAMPLING POINTS



DISSOLVED AIR FLOTATION TANKS



OZONE INJECTORS

quench any remaining ozone before water enters the GAC filters. The ozone-disinfected water is then passed through the three (77m³) granular activated carbon, biologically active filters to remove ozonation by-products and to make water biologically stable.

Final disinfection is achieved by adding chlorine gas. Fluoride is also added prior to the water entering the 9000 m³ treated water reservoir. From the treated water reservoir, water flows through a double 400 mm transmission line to the meter house. Pressure is reduced at the meter station and final adjustment and chlorine residual is automatically boosted if required. Then water enters the town distribution system. A pig launching system is available at the water treatment plant and the meter station to clean the transmission and main lines. Final flow metering is also carried out at the meter house.

Lab testing at the plant consists of total organic carbon, THM formation potential, dissolved organic carbon, turbidity, color, temperature, microscopic observation, pH, Cl₂ residuals and fluoride. A DR4000 *Hach* kit is used for much of the analysis. Particle counting is also done after the dual media filters and after the GAC filters.

Sincere thanks to
Matt Matatko, Town Engineer
Roy Laidlaw, GPEC Consulting
Ernie Formanek,
Operations Manager
Eric Tirschmann, Operator
Bert Pruneau, Operator

PERSONAL PROFILE
GERALD SAMUEL, P. ENG.
Manager, Certification and
Approvals Support Section
Municipal Program
Development Branch
ALBERTA ENVIRONMENT



During his considerable service, nearly 30 years with Alberta Environment, Gerald has done inspections, monitoring and troubleshooting at many Alberta water and wastewater facilities as well as numerous operator training sessions. Currently he reviews all operator certification applications, has input to water and wastewater facility approvals, chairs the Alberta Certification Advisory Committee, and provides the liaison with other associations in the water and wastewater industry.

On a personal note, Gerald was born and raised in Edmonton, graduating from Ross Shepard Composite High School. He received his B. Sc. in Civil Engineering from the University of Alberta. He is a long time resident of St. Albert where his sons grew up and also graduated from University of Alberta. From 1972 to 1995, Gerald was involved with the sport of fencing, serving at times as President of the Alberta Fencing Association and Vice President of the Canadian Fencing Association. He was also Chairman of the Fencing Competition for the 1983 World University Games and the 1994 Alberta Winter Games.

More recently, Gerald has taken up the game of golf and as with most of his endeavors, he is "honing" his skills on a regular basis. He can often be spotted at the Sunshine ski facility during the winter season, as he loves to ski. Never a dull moment!



KATHY AND GERALD AT WORK

Gerald Samuel has been involved in the Water and Wastewater industry for many years. In fact, he was one of the founding committee members who met on February 16, 1976 to start the Alberta Water and Wastewater Operators Association (AWWOA). Since that time he has organized all of the Annual Operators Seminars and has been involved with numerous water and wastewater training sessions.

Gerald has also held a variety of positions with the Western Canada Water and Wastewater Association (WCWWA), including President. A few of the well-deserved awards he has received are: the AWWOA Ron Bayne Service Award, the American Water Works Association Fuller Award, the Arthur Sidney Bedell Western Canada Section Water Environment Federation Award, the WCWWA H.C. Lindsten Award, and the Association of Boards of Certification Certification Officer Award. Obviously, he's actively involved with all of these Associations.

MESSAGE FROM THE AWWOA CHAIRMAN Doug Thorson

Greetings everyone. I hope all of you, and your families, have enjoyed the gift of the Christmas season. A time to be with friends and family, a time to reflect and a time to make commitments for the coming year. For me, at the end of every year, I add up all the time that I spend on the phone on hold and subtract it from my age. I don't count that time as really living you see. I spend more and more time every year on hold. By the time I die, I'm going to be quite young.

Just a brief update on the new structure between Western Canada and our AWWOA. We have been working to finalize this structure and get all of the ground rules in place so that everyone is on the same page with the services provided. Our business relationship under this new structure is coming along very well. The response to correspondence has greatly improved and day to day business is more efficient, much to the credit of Audrey Arisman. It is evident that Audrey loves her job and it certainly shows in her personable outgoing attitude. This new structure between Western Canada and our AWWOA should work out well for both of us.

As you know, we try to listen to the needs of our membership and respond in a way that will provide you with value added programs. One such program has provided members with a brief outline (roadmap) for those of you perusing levels three and four in water and wastewater. After preparing the first roadmaps, we are now providing more detail. This should provide significantly more value to those of you challenging certification exams. Your executive has been working to put in place an agreement with SAIT in Calgary to prepare these detailed modules for levels three and four. I am happy to report that through considerable effort from Frank Wetsch, we are close to signing an agreement.

I feel that I should briefly touch on your jobs as the custodians of our water and wastewater treatment, distribution and collection systems in this province of Alberta. Your job is an important one, it always has been. Sometimes the public loses sight of the value of reliable water and wastewater services, and takes them for granted. Today more than ever, our public recognizes the importance of the service you provide in every community across this province. As a result of the resurgence in our industry training program, registrations for courses are up significantly and technology is advancing in new and interesting fields. This means we, as Operators need to move forward with this technology and keep our level of knowledge full to the brim of the cup that has been passed to us. We are capable, and our Association is just one avenue that we as Operators can access training programs and advancing technology.

Don't miss this activity at the Banff Operators Seminar! Many of your executive members (including myself) have agreed to raise funds for Water For People by having their head shaved. I encourage each of you to get behind one of those poor fellas, pledge a donation, and raise the ante. Don't do it for them, but for all those deprived children and parents in far off countries who have never experienced the gift of water and sewage facilities. Stand up and take a bow members, you make me proud of our organization for supporting such a life giving cause.

If you are planning on attending our March 2001 Banff seminar, I would encourage you to create, with your own hands, a small project or craft that could be donated to the Water For People silent auction table.

Take care, the good Lord willing I will see you in March at the Operators Seminar.



WESTERN CANADA SECTION WATER FOR PEOPLE

If you have the opportunity to attend the 26th Annual Alberta Water and Wastewater Operators Seminar in Banff, March 6 – 9, 2001, you won't want to miss the Water For People – Canada activities. The Silent Auction is the perfect opportunity to bid on those great items that you just gotta have.

On Wednesday afternoon the "Hair Raising" event should provide some interesting entertainment as well. Six members of the AWWOA Executive have volunteered to have their heads shaved if they each receive pledges for a minimum of \$500.00. The hair falls shortly after the AWWOA Annual General Meeting so don't miss it.

All funds donated at the AWWOA Seminar will go toward the Laratay School Latrine and Shower Project in Cochabamba, Bolivia. This project supports the construction of three water seal toilets and a shower with septic tank and absorption well. Health and hygiene classes will be taught with hopes that school children will go home and explain the importance of latrines and sanitation to their parents. 362 school students will benefit from this project.

KIKINO WATER SUPPLY



Kikino is a community of 900 persons that in part relied on a conventional package plant treatment system to treat Lone Pine Lake water. Receding lake levels resulted in deteriorating water quality and concerns about long-term reliability of the supply. A study was conducted to evaluate different water supply and treatment options. A suitable lake water supply was found 12 km (7.5 miles) from Kikino. Conventional treatment and slow sand filtration were identified as viable treatment options through pilot testing. Kikino elected to proceed with construction of a concrete covered slow sand filtration treatment facility. The slow sand process was favoured for its operation simplicity and low skill labour maintenance requirements. The treatment process consists of a roughening filter, 4 slow sand filtration treatment cells, a granular activated carbon polishing filter and post-chlorination. A concrete covered basin design was selected to prevent algae growth within the slow sand cells during the summer and to minimize freezing during the harsh winters.

Intake System

The intake pump is automatically started and stopped based on a control signal from the main plant control panel. This control signal is based on the water level within the clearwell.

Up-Flow Clarifier Operation

Raw water is directed from the intake system to an up-flow filter. A mechanical flow meter monitors the raw water flow rate and generates a pulsed control signal that regulates the chemical feed rates for both the alum and polyelectrolyte.

In the up-flow filter, water passes upward through the media and spills into the splitter box where the flow is equally divided to the gravity filter cells. Backwash of the up-flow clarifier is actuated by either the loss of head pressure switch or the manual initiate pushbutton located on the main control panel.

Slow Sand Filter Operation

The slow sand filter operates by gravity. The PLC controls the outlet valves from the filter, when the raw water pump is operating, the filter effluent valves are opened, when the raw water pump is off, the filter effluent valves are closed.

Filter circulating pumps are also provided to maintain water circulation through the filter during cold temperature and low demand periods.

Differential pressure indicators at each filter give the operator an indication of the head loss through each slow sand filter cell.

Granular Activated Carbon Filter Operation

The granular activated filter system is operated by running a separate supply pump. The discharge from the pump is fitted with a flow control valve, which directs its flow to the Granular Activated Carbon Filter.

Chlorination System

Chlorine solution is injected into the filtered water stream in one of two locations, down stream of the flow meter (when the carbon filter is not in use), or in the effluent stream from the Granular Activated Carbon Filter (when the filter is in use).



Potable Water Transfer

Potable Water Transfer Pumps transfer treated water to the existing water reservoirs within the Town centre. Each of the Potable Water Pumps is fitted with hydraulic actuated deep well pump control valves. Each pump is started with the flow control valve in its full open position, once the pump starts, the valve slowly closes, bringing the pump on line.

The water supply line from the new water treatment plant is routed through the existing water treatment facility at Lone Pine Lake, which was converted to a truckfill station. The supply line is fitted with a hydraulic actuated pressure reducing/back pressure control valve. The outlet from this control valve is connected to the supply line that transfers potable water to the Reservoir System located within the Town centre.

The project has resulted in a reliable, simple to operate, low O&M cost treatment system, which has been welcomed by Kikino Administration and Residents alike.

FILTER SURVEILLANCE WORKSHOP RED DEER, JANUARY 23 AND 24, 2001

The Alberta Water and Wastewater Operators Association, in cooperation with Alberta Environment sponsored a tremendously successful Filtration Workshop in Red Deer recently. The workshop was over subscribed at 60 attendees and a number of people are waiting for the next one. Comments like "Very useful information and well worth attending. Would recommend this course to all those in water treatment" seem to indicate that it "hit the mark".



Sincere thanks to the City of Red Deer for the use of their water treatment facilities, the buses and their hospitality. Thanks also to David Hambley, Sheldon Swanson and Garry Drachenberg, the excellent instructors as well as Nicky Currie of AWI for her help.

Plans are currently under way for a sequel, to be held in Fort McMurray, in late March. A mail out, with details, will be sent to all AWWOA members soon.

Notice to All Persons Responsible for Operation of Landfills and Composting Facilities in Alberta

Alberta Regulation 192/96, passed in August of 1996 outlines the requirement for supervision of all Class II or Class III landfills and Class I or Class II compost facilities by certified operators. The compliance deadline, as stated in the Regulations is **September 1, 2001**.

To date, well over 100 municipal waste facility operators have been certified and many more are currently in the process of obtaining certification.

Additional information about the Municipal Waste Facility Operator Certification Program, including the Certification Guidelines can be obtained on the Alberta Environment website at <http://www.gov.ab.ca/env/> or you can contact Del Morrison at (780) 427-8130.

Please note, the final certification exams prior to the September 1st deadline are May 29, 30, 31 and June 1st. The deadline for applications for that certification exam session is April 10th. Apply early!

MUNICIPAL WASTE MANAGEMENT FACILITY OPERATOR CERTIFICATION FOR COMPOST FACILITIES

Olds College will be offering a 4-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.

Certification Exams will be held by Alberta Environment. Certification Exam Applications must be received by Alberta Environment by April 10, 2001 for the May 2001 exam session. Contact Alberta Environment directly to obtain applications for certification examination. To register for the tutorial call Olds College at: 1-800-661-6537, ext. 4684 or 403-556-4684.

Location: Olds College
Date: May 14 – 17, 2001
Fee: \$499 (prior to April 30)
\$550 (after April 30)
Fee includes study guide

COURSES OFFERED 2000 - 2001

The following courses are still being offered. If you wish to register for any of these courses please mail or fax your registration in with your payment to: (780) 427-5204. If you require more information please contact Del Morrison at (780) 427-8130. Please note: registrations are limited, so register early. Some courses are already nearly full.

COURSE	LOCATION	DATES
Management & Supervision for Operators	Edmonton	February 13 - 16, 2001
Level II Certification Preparation Course	Edmonton	March 21 & 22, 2001
Alberta Operators Seminar	Banff	March 6 - 9, 2001
Chlorination Workshop	Red Deer	April 10 - 12, 2001
Level I Certification Preparation Course Part "A"	Edmonton	April 3 & 4, 2001
Level I Certification Preparation Course Part "B"	Edmonton	May 15 & 16, 2001
Small Water Systems Course	Red Deer	May 2, 2001
Small Wastewater Systems Course	Red Deer	May 3, 2001

CALL FOR PAPERS 2001 - SERVING THE WORLD

Preliminary Announcement and Call for Papers for the 53rd Annual Convention of the Western Canada Water and Wastewater Association and the Canadian Public Works Association - October 28-31, 2001, Edmonton, Alberta. Papers are requested in the following water, wastewater and public works industry topic areas:

- Regulations
- Emerging Technology
- Benchmarking
- Best Management Principles
- Right of Way Management
- CEPA Toxic Materials - Ammonia, Road Salt
- Infrastructure - Buildings, Land, Equipment
- Stormwater Quality
- Operations Optimization
- Solid Waste
- Energy Management
- Public-Private Partnerships

The abstract submittal deadline is April 17th, 2001. If you are interested in presenting papers, please contact:

Technical Program
Mr. Vince Corkery, P. Eng.
C/o City of Edmonton, Drainage Services
Gold Bar Wastewater Treatment Plant
10977 - 50 Street, Edmonton, Alberta T6A 2E9
Telephone: (780) 496-4323 • Fax: (780) 496-4694
e-mail: vince.corkery@gov.edmonton.ab.ca

Operators Program
Mr. Jim Hepler
C/o Town of Devon
1 Columbia Avenue West, Devon, Alberta T9G 1A1
Telephone: (780) 987-3415 • Fax: (780) 987-3227
e-mail: wtp@trinustech.com

2001 CERTIFICATION EXAM SCHEDULE

Anyone who is interested in writing the exams may request application forms from:

Alberta Environment
Environmental Sciences Division
Municipal Program Development Branch
5th Floor, 9820 - 106 Street
EDMONTON, AB, T5K 2J6
Fax: (780) 427-5204

The **DEADLINE** for receipt of completed applications for examinations is listed below. Applications received after the deadlines, for any reason, **WILL NOT** be accepted. **IT IS THE RESPONSIBILITY OF THE INDIVIDUAL WHO IS APPLYING FOR CERTIFICATION TO ENSURE THAT HIS/HER APPLICATION IS RECEIVED ON TIME.** Applications must be prepared for and reviewed by the Certification Advisory Committee. Completed applications and a copy of transcripts or diplomas/degrees as well as other **RELEVANT** information must be submitted.

May 29, 2001	Edmonton	April 10, 2001
May 29, 2001	St. Paul	April 10, 2001
May 30, 2001	Red Deer	April 10, 2001
May 30, 2001	Peace River	April 10, 2001
May 31, 2001	Medicine Hat	April 10, 2001
May 31, 2001	Grande Prairie	April 10, 2001
May 31, 2001	Lethbridge	April 10, 2001
June 1, 2001	Calgary	April 10, 2001
June 1, 2001	Lac La Biche	April 10, 2001

ALBERTA LANDFILL OPERATOR TRAINING COURSE

Due to the strong interest shown by Alberta solid waste managers, SWANA¹ Canadian Prairie Chapter and NAIT² will be delivering a supplementary Alberta Landfill Operator Training Course in Edmonton on February 26 - 27, 2001. This course has been arranged for those individuals who have not been able to get into the sold-out courses in Edmonton (Jan. 22-23/ '01) and Calgary (Feb. 22-23/ '01). 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 to serve 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.

Preparations are also underway to deliver the following 1-day training courses throughout 2001:

- Small Transfer Station Operator Training
- Windblown Litter Control
- Waste Sorting and Screening
- Collection Operator Training

For more information on the above courses, please contact Dr. Bruce W. Taylor at (780) 496-6871 or Jane Banks at (780) 496-6879 or by E-mail at <bruce.taylor@gov.edmonton.ab.ca>. For information on Operator Certification Exams, please contact Del Morrison at (780) 427-8130.

¹ Solid Waste Association of North America

² Northern Alberta Institute of Technology



The **Alberta Utility Operator** is published three times a year by the Municipal Program Development Branch of the Environmental Sciences Division, Alberta Environment, 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 Environment 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 ENVIRONMENT
5th Floor, 9820-106 Street
Edmonton, Alberta T5K 2J6