

ALBERTA



UTILITY OPERATOR

NEWSLETTER

FALL 2001 - NUMBER THREE

FEATURE FACILITY:

The Town of Picture Butte Water Treatment

The Town of Picture Butte, located approximately 27 km north of Lethbridge on Highway 25, is a growing community and service centre for the area north of Lethbridge. The current population is approximately 1800.

The raw water source for the Town of Picture Butte water treatment facility originates from a diversion of the Old Man River to Keho Lake, then to Butte Lake and from there to the raw water reservoirs, with a total volume of 60 ML. This system allows for the use of series singular, single reservoir use, or drawing water directly from Butte Lake.

A shortage in capacity and difficulty meeting Alberta Environment drinking water standards necessitated the upgrade of the Town's Water Treatment Facility.



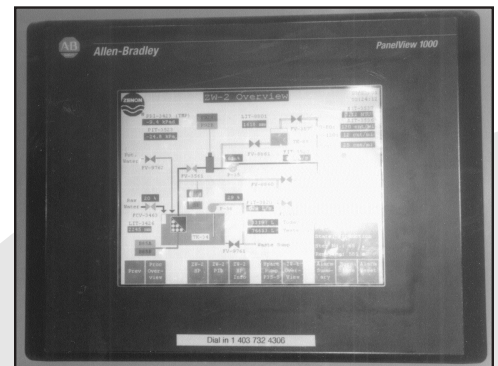
RICK LEWIS IN THE LAB



WATER TREATMENT PLANT UPGRADE OCTOBER 2001

Raw water enters the facility where poly aluminum chloride can be added at the flash mixer. The water then flows through the flocculation chamber where powdered activated carbon can be added.

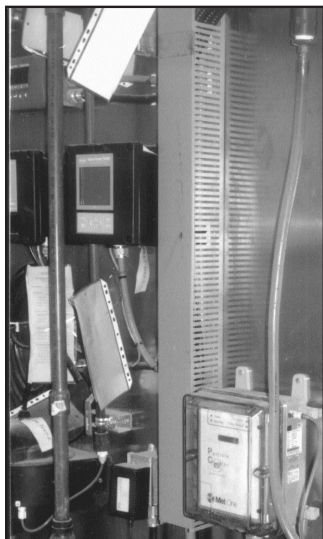
Flocculated water then flows to the membrane filter chamber. The Zenon membrane equipment has been installed in the old clearwell,



MAIN ZENON PLC

retrofitted to hold the membrane cassettes. Two trains of three cassettes each will be capable of producing 3.4 ML/day with future expansion, by adding more membranes, to 4.5 ML/day. Each train consists of filter cartridges having a nominal filter pore size of .04 microns. Each of the 2W-500b cassettes has a surface area of 480m². During the retrofit of the treatment plant, filtration of the water has been accomplished using a temporary 2.25 ML/day filter tank containing eight cassettes of membranes.

The filtered water permeate, is then disinfected using chlorine gas before flowing to the two on-site treated water reservoirs. The treated water reservoirs, 2.4 ML and 1.4 ML are baffled to ensure adequate "CT" for disinfection. The five multi-stage vertical turbine service pumps distribute the treated water to town. The fire pump, as well as the new diesel generating set, ensures adequate fire flow and plant operation during possible power interruption.



PARTICLE COUNTER & TURBIDITY METERS

The membrane filtration system has a 90% recovery rate, with a 10% reject to waste. The waste stream goes to the sanitary sewer for disposal. The three permeate pumps pull water through the membranes. Cleaning of the membranes is conducted by a backpulse (backwash) at 35 L/sec for 30 seconds every 15 minutes. The backpulse water is supplied from the two large backpulse tanks. Organic fouling can be periodically removed with the 500 mg/L to 1000 mg/L hypochlorite clean-in-place system. It is

anticipated that organic cleaning of the membranes will only be required a few times per year. Inorganic, or mineral fouling, can be removed using the citric acid clean-in-place system. Both clean-in-place processes result in a waste discharge which is neutralized before being disposed to the sanitary sewer. All plant control valves are pneumatically activated. Membrane life expectancy is expected to be seven to 10 years. On-line raw and treated turbidity monitoring



CLEAN IN PLACE PUMPS



PERMEATE PUMPS

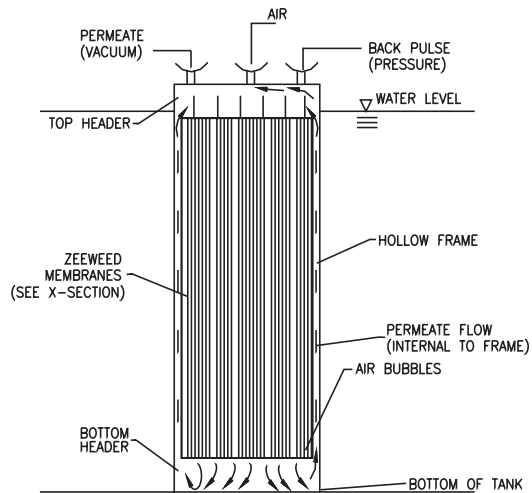
as well as treated water particle counting ensure that the permeate is adequately treated.

The powdered activated carbon (PAC) is added into the flocculation tank from a hopper, under vacuum, using a K-Tron Soder K-2 volumetric feeder. Hydro fluo silicic acid and, hypochlorite are added by using Wallace and Tiernan/U.S. Filter positive displacement diaphragm pumps.

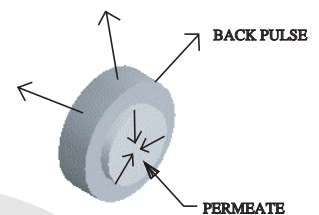
In addition to the on-line particle counter and turbidity meters, chlorine residual is monitored in the water going to the distribution system. Daily testing consists of free and total chlorine residual pH, color, and turbidity. Weekly testing consists of hardness, alkalinity turbidity, chlorine residual and bacteriological testing.

The residents of Picture Butte have already noticed improved water quality and should enjoy even better water as the permanent facility goes on-line.

Thanks to Rick Lewis the lead plant operator, and Andy Barr, with Associated Engineering Alberta Ltd. for their assistance in making this article possible.



TYPICAL ZEEWEED MODULE (1.8M x .7M)

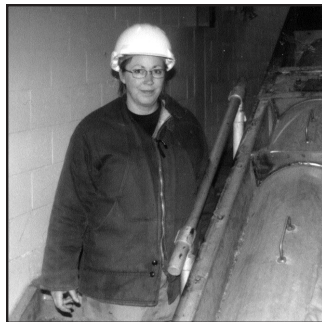


PERSONAL PROFILE COLLEEN FELTMATE The City of Edmonton - Goldbar Wastewater Treatment



Colleen was born approximately 45 km northwest of Grande Prairie, on a farm near La Glace. She went on to attend high school in Sexsmith and in 1975 moved to Edmonton. Over the next couple of years, Colleen worked for an oil company and Edmonton Telephones. In 1979 Colleen applied for and obtained one of the new operator positions that came about as a result of a major upgrade of the Goldbar facility. Since 1979 Colleen has progressed to Level III Operator and has completed Sacramento training as well as obtaining her Builders A ticket.

The Goldbar Wastewater Treatment Plant, where Colleen works, is a Level IV facility with a 350 ML/day capacity and about 100 employees. Treatment consists of mechanical screens, grit removal, primary clarifiers, biological nutrient removal (BNR), secondary clarifiers, sludge digesters and ultraviolet disinfection. Secondary waste sludge is processed in a dissolved air flotation (DAF) thickener and then digested. Sludge from the digesters is pumped to sludge lagoons and later applied to farm crops.



Colleen has been a member of the Alberta Water and Wastewater Operators Association (AWWOA) and the Western Canada Water and Wastewater Association (WCWWA) for a number of years. At the Annual AWWOA Operators Seminar, Colleen was elected to the AWWOA executive and currently is working on the AWWOA Water For People-Canada Committee as well

as the Annual Seminar Guest Program Committee. She enjoys being involved, helping the AWWOA achieve its goals, and would like to encourage others to run for election.

Colleen lives at Antler Lake, approximately 18 km southeast of Edmonton. She has two sons in their teens, and enjoys camping with the boys in the summer and cross country skiing in the winter. The decision to work in the wastewater treatment industry "has been a really good career move" for Colleen and she comments that at work 'people are like family'. She has appreciated the supportive management and the many "mentors" that she has worked with.

WATER FOR PEOPLE UPDATE

During the 2001 Western Canada Water and Wastewater Association/Canadian Public Works Association Annual Conference, over \$7,600.00 was raised by conference delegates for Water For People-Canada. When combined with other fundraising events held by the Alberta Water and Wastewater Operators Association and the AWWA Membership Committee, close to \$19,000.00 was raised by the Western Canada Section in 2001. As a result of the terrific response, both the Pamezul Water Project in Guatemala and the Mamani Manual Pump and Health Training Project in Bolivia will be totally funded by this section this year.

There were several fund raising events held during the WCWWA Conference including a Putt for People event, The Hair Raising Event Part II, the AWWA Young Professionals Evenings, a Wet Tapping Contest and a Silent Auction. One of the highlights was the Dunk Tank which allowed a few people to make a "splash appearance" at the event and "bathe" for the cause. Special thanks goes out to:

Andy Bebbington, Town of Devon, Past President, WCWWA
John McManus, Infrastructure Systems Ltd.
Karen Sutherland, Earth Tech
Garry Drachenberg, Associated Engineering Alberta Ltd.
Audrey Arisman, Executive Director, WCWWA
Bob Buie, UMA Engineering Ltd.
Larry Williams, Alberta Environment, AWWA Past Chair
Kathy Abramowski, Alberta Environment, WFP-C,
Western Canadian Section Chair

We expect 2002 will be even more successful than 2001 and we trust AWWOA members will once again play a key role helping raise much needed funds. This year, the AWWOA hopes to raise enough funds for the "Bolivia Machaj Marca Water & Health Training Project" which will benefit a school, orphanage and small community. We hope to raise \$4,800 (US) to help improve the lives of children in this region. Along with the Silent Auction, we plan to hold a pie throwing event and raise funds through the purchase of Water-for-People coffee mugs, T-shirts and pins.

Please note that we are always looking for volunteers to help out. If you are interested in volunteering or learning more about Water for People please feel free to contact Kathy Abramowski at (780) 427-7713.

We look forward to your on-going support and seeing you at the Annual Operators Seminar.

MESSAGE FROM THE AWWOA CHAIRMAN Gerard Hollman

Hello again and what a year it has been, drought in the south and lots of snow in the north. Hopefully everybody gets their share of snow this winter. I am sure that all of you operators have checked the security on your reservoirs since September 11th and if not, get them locked up. It looks like Alberta Environment is out there ensuring that everyone is complying with the terms of their facility approvals. We can expect more of this thorough approach in the future as the Province tries to make things safer. Things look like they are starting to come together for our Annual Banff Operators Seminar. It will be held March 12 to 15, 2002 at the Banff Park Lodge. Hope to see you there.

AWWOA Chairman
Gerard Hollman

UPDATE AWWOA November Executive Meeting

The following is a short summary of business conducted.

- Level III and IV Advanced Curriculum Project
The "Coles Notes" phase of the project is proceeding but unfortunately no completion date is available. Various Groups/Associations have expressed interest in participating in developing advanced training materials.
- The Level I Certification Preparation Course video re-make is progressing well. The video is being completely updated and revised.
- Mandatory training for operator certification and certificate renewal was discussed. The possibility of certification fees was also reviewed.
- The Annual AWWOA Operators Seminar will be at the Banff Park Lodge, March 12 to 15, 2002. It will include technical sessions, a workshop, teleconference, trade show, Water for People Activities and a guest program.
- The AWWOA Bursary has been awarded for 2001 to Mr. Brad Griko of Spruce Grove.

WATER and WASTEWATER ANNUAL REPORTS by Alvin Beier, AENV Red Deer Regional Office

It's that time of year again to get all the information ready for the annual water and wastewater reports submission to Alberta Environment (AENV). It is crucial that this information be gathered and submitted as required. Far too often these reports are submitted incomplete or with inappropriate information. The following questions and answers should assist you regarding the completion and submission of annual reports:

- **Why are they Required?** An approval to operate is issued to each facility pursuant to Part 2, Division 2 of the Environmental Protection and Enhancement Act (EPEA). This makes it a legal document and therefore it must be complied with. Each approval requires the submission of an annual report.
- **What information is Required?** Each approval to operate clearly lists the information that is required in the report. The annual report is a summary of the monthly monitoring data, including the average, maximum and minimum monthly results. Check your approval to ensure that all of the information is collected, including a copy of the annual or bi-annual water sample analysis.
- **Who has to do it?** Although the owner is responsible for the facility, it is the responsibility of the certified operator in charge to know the terms and conditions in the operating approval for their facility.
- **What form should I use?** Over the years, several different versions of forms have been used; many of which do not capture all of the data that is required. With the availability of computers today, it should be easy for the approval holder to produce a spreadsheet that will capture all of the information required by the approval.
- **Is there an electronic form?** AENV is presently developing an electronic program to capture all of the required annual reports on electronic format that ultimately could be posted on the web for public viewing. Stay tuned.
- **How do I summarize the bacteriological data?** Record the total number of bacteriological samples collected each month with results listed for those that have indicated the presence of coliforms or HPC's > 500. Be sure to include a summary of all incidents that required follow-up as per the bacteriological protocol.
- **When is it required?** The annual reports are required to be in the respective regional office by February 28 of the year following.
- **What happens if I don't do one?** Failure to submit the appropriate reporting and monitoring information as required by the approval to operate is an offence under EPEA. Enforcement action can be taken against both the approval holder and the certified operator.

If you have any questions regarding the completion or submission of your annual reports, please contact your Alberta Environment Regional Office.

COURSES OFFERED 2002

The following courses are 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.

COURSE	LOCATION	DATES
Cross Connection Control – Inspectors Course	Edmonton	January 14 - 18, 2002
Filter Surveillance	Calgary	January 22 & 23, 2002
Management & Supervision for Operators	Edmonton	February 12 - 14, 2002
Alberta Operators Seminar	Banff	March 12 - 15, 2002
Level II Certification Preparation Course	Edmonton	March 20 & 21, 2002
Chlorination Workshop	Calgary	April 16 - 18, 2002
Level I Certification Preparation Course Part "A"	Edmonton	April 2 & 3, 2002
Level I Certification Preparation Course Part "B"	Edmonton	May 15 & 16, 2002
Small Water Systems Course	Red Deer	May 1, 2002
Small Wastewater Systems Course	Red Deer	May 2, 2002

2002 CERTIFICATION EXAM SCHEDULE

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

Alberta Environment
 Regulatory Assurance Division
 Approvals Support 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.

March 12, 2002	Banff	January 20, 2002
May 28, 2002	Edmonton	April 10, 2002
May 28, 2002	St. Paul	April 10, 2002
May 29, 2002	Red Deer	April 10, 2002
May 29, 2002	Peace River	April 10, 2002
May 30, 2002	Medicine Hat	April 10, 2002
May 30, 2002	Grande Prairie	April 10, 2002
May 30, 2002	Lethbridge	April 10, 2002
May 31, 2002	Calgary	April 10, 2002
May 31, 2002	Fort McMurray	April 10, 2002

NOMINATIONS

Do you want a say in government programs that affect Water and Wastewater treatment operators?

Interested in a higher profile in Municipal, Utility, Company or Public Works?

Care to submit direction to the Western Canada Water and Wastewater Association?

How about being a key driver in training, provincial operator certification programs, setting proficiency standards and encouraging the best possible operations for Water and Wastewater facilities in Alberta.

Are you up to that kind of challenge?

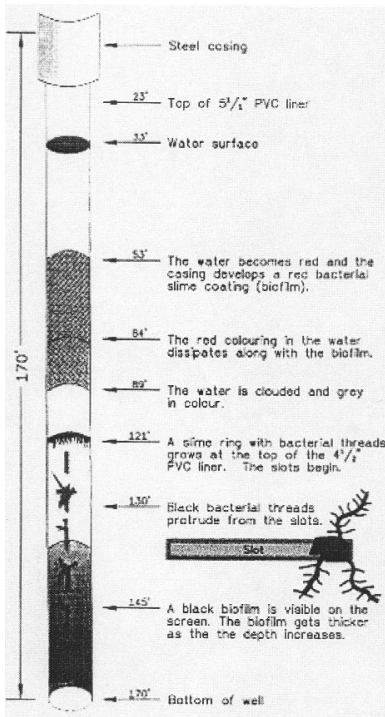
The AWWOA needs you as an executive member of our Association. We are looking at nominations for all sizes, categories and regions of operations in Alberta. Grab this opportunity and challenge to be elected to represent your peers in the Water and Wastewater fields for Alberta.

Submit your nominations to Andy Maguire
 C/O AWWOA
 Edmonton, AB.

SUSTAINABLE WATER WELL INITIATIVE BIOFOULING AND WATER WELLS IN THE M.D. OF KNEEHILL, AB continued from Summer Alberta Utility Operator



INTENSIVE DIAGNOSTIC TESTING OF SEVEN WELLS



Biofouling was evident in each of seven wells chosen for detailed diagnostic testing. The down hole videos confirmed that all seven wells showed one or more of the following signs of bacterial growth:

biofilms (slime), bacterial threads, bacterial flakes, and cloudy water. The adjacent figure summarizes observations in one well.

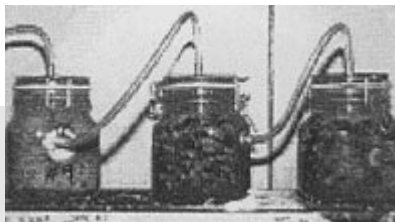
All seven of the wells were biofouled by very aggressive sulfate reducing bacteria.

Clogging by bacterial growth is very likely causing a reduction of water flow to these wells. This clogging is caused by accumulation of biofilm,

secreted by the bacteria, that fills the well intake openings and the pore space in the aquifer surrounding the well.

LAB STUDIES

Lab tests were used to evaluate a new Ultra Acid-Base (UAB™) treatment process developed by Droycon for the rehabilitation of severely biofouled small diameter water wells.



The results were very promising and field trials are scheduled for fall 1997 to confirm the effectiveness of the UAB™ treatment process on typical farm wells.

CURRENT RECOMMENDATIONS

PFRA is continuing to work with the Alberta Agriculture, Food and Rural Development, Alberta Environmental Protection and the water well industry to promote water wells that last for generations. Studies are currently underway to determine the optimum well maintenance and monitoring strategies for this area. IN THE INTERIM, the following is recommended:

1. Preventative maintenance should be carried out in all wells to control biofouling. Shock chlorination once or twice a year is currently the method most often recommended to control biofouling. Well owners can do this themselves or they can hire water well drillers or well service companies. In recent years, newer chemical products have been developed that are reported to have some advantages over shock chlorination (the chemicals are less corrosive and safer to handle; the chemicals penetrate the biofilm more effectively)> Contact your local well driller(s) for more information.
2. Well owners should monitor their wells on a regular basis (see *Wells that Last for Generations*) publication available from Alberta Agriculture, Food, and Rural Development, Alberta Environmental Protection, or PFRA). Monitoring allows a well owner to determine the optimum time between well maintenance. In the study area, monitoring of sulfate reducing bacteria levels will determine the degree of biofouling in about 90 per cent of the wells. A simple monitoring tool for this bacteria (the Presence/Absence SRB-BART™ test) is available from Droycon Bioconcepts Inc. (306-548-1762 or Email: "roy.cullimore@uregina.ca").
3. Alternatives to well replacement should be investigated when biofouling has progressed to the stage where well maintenance will no longer work effectively. Technologies have emerged in recent years that may allow wells to be rehabilitated rather than replaced. As well rehabilitation generally requires the presence of a drill or service rig, the addition of chemicals, and substantial experience with this type of work, qualified members of the water well drilling or well servicing industries should be consulted.

Acknowledgements

Funding for this study was provided under Agriculture and Agri-Food Canada's Rural Water Development Program and under the Canada-Alberta Environmentally Sustainable Agriculture Agreement. Technical assistance provided by Dr. Roy Cullimore and Twyla Legault of Droycon is gratefully acknowledged. Video logging assistance provided by Alberta Environmental Protection is also acknowledged.

For more information, contact:

John Lebedin
Earth Sciences Division
PFRA Headquarters
Regina, Saskatchewan
(306) 780-5207
Email: pf10281@em.agr.ca

Terry Dash
Regional Hydrogeologist
Southern Alberta Regional Office
Calgary, Alberta
(403) 292-5719
Email: pf10279@calpfra.calpo1.ca

OPERATOR CERTIFICATION: THE FUTURE

*This is an excerpt from a paper entitled **OPERATOR CERTIFICATION: THE FUTURE** by **Gerald Samuel** presented at the October 2001 Western Canada Water and Wastewater Association Annual Conference.*

Alberta has had a mandatory water and wastewater operator certification program in place since 1983. It was the first mandatory program in Canada. There are currently over 1600 operators certified under the Alberta program. -Editor

WHY CHANGE?

In May 2000 an outbreak of E. Coli 0147:H7 took place in the town of Walkerton, Ontario. The resulting inquiry raised the profile of the operator and has resulted in many changes to certification programs in Canada. The cryptosporidiosis outbreak in North Battleford in the spring of 2001, increased the focus on water systems and water system operation.

Even though there were certification programs across Canada before these incidents occurred, the increased attention and the resulting political interest made changes inevitable. Since May of 2000, Ontario has changed many of its certification program policies, Alberta is in the process of reviewing its operator certification and training programs, Saskatchewan and Manitoba are instituting mandatory programs and BC is looking at making more components of its program mandatory. Many of these changes would have occurred in due course, but the process is being accelerated due to the water system problems.

RECENT CHANGES

The trend is for all operator certification programs to become mandatory. In Canada, the programs in Alberta, Ontario and Nova Scotia are mandatory. British Columbia has had mandatory certification for wastewater treatment plant operators since 1993 and mandatory certification for water treatment plant and water distribution system operators has been passed in the legislature and will come into effect as soon as the program rules are finalized. Saskatchewan and Manitoba are in the process of implementing legislated mandatory certification. Quebec has taken strides, through Reseau Environnement, to have a certification program put in place. The provinces of Prince Edward Island, New Brunswick and Newfoundland have voluntary certification programs at this time.

The US EPA Safe Drinking Water Act was reauthorized in 1997. There were changes that affected the certification

programs administered by the states. Before 1997 water operator certification programs in the US were not mandatory. The new law required every state to have a mandatory program. It also required renewal of all certificates with a maximum three-year renewal period and a requirement for continuing education for renewal.

The US EPA Clean Water Act will be reauthorized at some time in the future. The exact date is not known, but the requirements will probably be similar to those of the Safe Drinking Water Act.

Since May 2000, Ontario has made changes to its certification rules that require continuing education for renewal and require a high school diploma for Level I Certification.

THE FUTURE OF OPERATOR CERTIFICATION

The recent focus on the operation of municipal facilities has made it necessary for operator certification agencies to review their programs and to consider changes. The requirements that are on the horizon and will have to be considered are:

- Requirement for continuing education for renewal. In the US, all of the water facility operator certification programs must now require continuing education for certification renewal. Ontario has proposed this change already and Alberta is considering it.

This practice will be consistent with many other professions. It will encourage operators to keep current with changing technology and to seek professional development opportunities.

- Requirement for a high school diploma for Level I certification. *(This has been a requirement in Alberta since 1991. – Editor)*

The original program guidelines adopted by the Provinces allowed substitution of experience for high school. Alberta discontinued this substitution in 1991 and Ontario has subsequently done the same. The reason is that a high school diploma (or recognized equivalent) provides the building blocks and problem solving skills that operators need to do their jobs as they become more and more technical.

- Requirement for mandatory training for certification.

Even though operators need to have a certain amount of knowledge to pass a certification exam, it is possible for them to pass the exam without being aware of certain regulations, risks or procedures. In order to minimize this, certification authorities may require completion of a specific course. The course may be delivered by correspondence, in a classroom, over the internet, etc.

- Compliance and enforcement.

Once programs are legislated and become mandatory, it is the responsibility of the regulatory agency to ensure compliance. This will mean, in most cases, that there will be some enforcement action if a municipality, or operator, does not comply with established standards. It also becomes the responsibility of the certified operator to make sure that his/her facility meets all standards and that there is back-up for the operator.

This will be new for many operators and municipalities. In the past, provincial governments have not been strict with enforcement in some areas.

- Exceptions

As with any rules, there are exceptions. The areas where it will be difficult for municipal systems to have a certified operator at all times are the very small systems. Often there is only one operator and even then, she/he is only part time. Regulatory agencies will have to make allowances for getting certified operators in place.

The system owners will also have to take responsibility to do everything possible to have certified operators in place as required by legislation. This may mean cooperative efforts among small systems in a region.

AWWOA BURSARY

The AWWOA Executive takes great pleasure in awarding their Full-time Student Bursary to Mr. Brad Griko. Brad is a member in good standing with the AWWOA, has met all of the requirements of the bursary award. He currently is working at completing the N.A.I.T. Water and Wastewater Technician Program in May, 2002."

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CONCLUSION

The concept of operator certification has been in place for many years. It has taken a few unfortunate incidents to bring it to prominence. Now, the operators and municipalities need to recognize the changing priorities of the public and politicians and meet the new requirements placed on them. This means they need to look ahead and be prepared for the changes in the operator certification regulations and the way they are applied. It means that municipal managers and operators need to treat facility operation in a more professional manner. The public, the environment and our water and wastewater systems are worth it.

NAIT ACHIEVEMENT AWARD

The AWWOA would like to congratulate Mr. Dean McGlone on receiving the award for achieving the highest overall average marks in the NAIT Water and Wastewater Technician Program for the year 2000. This award is presented each year at the AWWOA Annual Awards Banquet to recognize the considerable effort required to attain this level of achievement.

The Alberta Utility Operator is published three times a year by the Regulatory Assurance Division, Approvals Support Branch, 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.