TRAINING AND ACCREDITATION OF WATER SUPPLY PROFESSIONALS

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ABC, The First Ten Years 1972 – 1982, Harris F. Seidel, 1998

Certification Education and Training in Canada for the Water and Wastewater Operator, Balacko, October 1993

Certification Program Guide, Association of Boards of Certification, May 1996

Final Guidelines for the Certification and Recertification of the Operators of Community and Non-transient Non-community Public Water Systems, US Environmental Protection Agency, February 1999

Model Act and Regulation, Association of Boards of Certification, April 1999

Ontario Water and Wastewater Operator Licensing and Facility Classification Guide, www.oetc.on.ca/program guide.htm

Operator Certification Program Standards, The Association of Boards of Certification, April 1999

Water and Wastewater Operators Certification Guidelines, Alberta Environment, January 1994

TRAINING AND ACCREDITATION OF WATER SUPPLY PROFESSIONALS

1. INTRODUCTION

The provision of safe drinking water for communities is a critical aspect of protecting public health. The responsibility for quality public water supplies lies with scientists, design engineers, municipal officials, government regulators, government inspectors, public health authorities and water facility operators.

This paper examines the training and accreditation of those involved in the operation of water treatment facilities and, in particular, focuses on the Ontario system of training and certification of municipal water treatment plant and water distribution system operators.

2. BACKGROUND

In May 2000 an outbreak of E. Coli 0147:H7 took place in the Town of Walkerton, Ontario. The resulting inquiry raised questions about the training and accreditation of some of the people involved. This paper will address, not the Walkerton situation specifically, but the Ontario training and accreditation system itself.

3. CURRENT PRACTICES IN ONTARIO

3.1 Operator Certification

The first proposal for a certification program was drafted in 1979. The Ministry of the Environment (MOE) decided to concentrate on operator training for the short term while developing stakeholder support for certification.

In 1987 Ontario introduced a voluntary operator certification program for water and wastewater operators. The program allowed operators to obtain a licence based on standards recommended by the Association of Boards of Certification (ABC), which is a North American association which provides certification program support.

The operator certification program was approved and jointly administered by the Municipal Engineers Association, the Ministry of the Environment and Metro Toronto. An Advisory Board of Certification was established to oversee the program. This is now called the Advisory Committee on Water/Wastewater Operator Certification and is discussed further in Section 3.2.

Between 1988 and 1990 a "grandfather" program was available. It was put in place to allow existing operators to obtain a certificate before a mandatory program was initiated. It also helped to ensure that existing operators would not lose their jobs when a mandatory program was instituted.

The rationale for a "grandfather" program was:

1. The issuing of grandfather certificates recognized that operators with many years of experience and with a thorough knowledge of the system have the necessary skills to continue to operate their facilities.
2. New standards would ensure that all new operators, and all operators wishing to upgrade their licences, meet full certification standards.
3. The grandfather certificate program also ensured that small and/or remote communities would not lose operators who did not meet new requirements.

Ontario Regulation 435/93[1] enacted July 26, 1993 created a mandatory licensing program for operators of drinking water and domestic sewage treatment facilities in Ontario. The program established recognized professional standards for operators. The program guide is attached as Appendix 1 and the Ontario Regulation 435/93 (as amended) is attached as Appendix 7.

The grandfather program was extended to January 31, 1994 to allow existing operators to become certified so that they would not lose their jobs. Approximately 5000 grandfather certificates were issued under both grandfather program rules (pre and post 1994). Originally, the grandfather certificates were limited to a specific water authority. In 1991 that restriction was lifted and this type of certificate was valid throughout the province.

Once the mandatory program was in place, a limited grandfather certificate was made available. While the earlier grandfather certificates (1988-1990) were good for life, each holder of the new limited grandfather certificate was required to pass an examination within three years or his/her certificate would be lowered by one class.

Under the mandatory certification program, operators were required to meet all of the education, experience and examination requirements of the program. Under the grandfather program, operators were not required to meet all education or examination requirements.

The examinations used for certification were originally provided by ABC. By 1997 these exams had been amended to suit Ontario's particular needs. In both cases, the exams are based on established need-to-know criteria and are periodically reviewed by subject matter experts and psychometricians.

[1] Water Works and Sewage Works Regulation, O. Reg. 435/93 as amended by O. Reg. 539/98 promulgated under the *Ontario Water Resources Act*. This regulation as amended governs "owners" as defined as "a municipality or person having the authority to construct, maintain, operate, repair, improve or extend water or sewage works." It is the owner that must ensure that operations personnel comply with the regulation.

In 1998 the regulation (435/93) was amended to provide a conditional licence. This allowed the Director greater discretion for issuing licences when special or unusual circumstances applied.

In 1999 a sub-level of the Class I licence was established for small water systems. This licence requires examination but not training.

The responsibility for the certification program remains with the MOE Director, supported by an advisory committee, but the program is administered by the Ontario Environmental Training Consortium (OETC). Program administration is awarded under contract every three years.

Water industry professionals support the concept of operator certification programs. The Ontario Water Works Association (OWWA) is a Section of the American Water Works Association (AWWA) and supports mandatory certification consistent with the AWWA statement of policy on operator certification. OWWA also supports the AWWA statement of policy on Employee Training and Career Development. Both of the AWWA statements of policy are attached as Appendix 5.

3.2 Advisory Committee on Operator Certification

An Advisory Committee on Water/Wastewater Operator Certification was established in 1987 to provide the Ministry with expert advice from operators and owners. The committee meets 2-3 times a year to advise the Ministry on policy issues and individual operator concerns, but has no enforcement capabilities. The Committee make-up consisted of Ministry staff, certified operators and representatives of concerned associations, agencies and unions.

Effective August 2001, the make-up of the Committee will consist of four elected certified operators, two representatives of MOE and six representatives of water industry associations. This change is intended to enhance the credibility of the certification program.

3.3 Operator Training

Since the early 1960s there has been formal training in the water and wastewater industry in Ontario. Originally, the Ontario government focused resources on developing operator training programs. In the mid 1970s, the MOE Human Resources Branch, Training Section developed over 20 courses that were attended by over 16,000 participants between 1975 and 1995. A training centre in Brampton provided facilities and administrative support for operator training. Training, as such, was never mandatory.

In 1990 the Ontario Environmental Training Consortium (OETC) was formed with financial support from MOE. The consortium consisted of community colleges which offered technical environmental programs. The stated goal of the OETC was to increase training opportunities for operators, relieve the training pressure on the Brampton training facility, provide regional training sessions and to create linkages between MOE and community colleges.

Problems arose because the training at Brampton was heavily subsidized and the community colleges could not compete. MOE raised its prices for training taken in Brampton but that only decreased the demand for the course offerings. In the initial stages, the training offered through the OETC community colleges was successful and provided the desirable regional delivery. But co-ordination among all of the community colleges was difficult. OETC stopped providing organized training in 1995 but several colleges continued to offer operator training on an ad hoc basis.

In 1995 the Brampton Training Centre was closed for municipal water and wastewater operators. MOE transferred the training of operators to the Ontario Clean Water Agency (OCWA). OCWA operates approximately one third of the Ontario plants under contract. OCWA provided training for its own operators as well as all other municipal operators until 1999 when it stopped providing training for other than its own operators. During this period OETC gradually ceased to offer training through community colleges. Although the Ontario Water Works Association and the Water Environment Association of Ontario do provide training, it is generally in the form of conferences or specialty seminars and is directed toward people in all aspects of the industry rather than targeted to operators.

During the 1990s, several private sector trainers began to offer training to meet the requirements of operators. As well, many of the large Regional Municipalities started to develop their own in-house training to meet the needs of their own operators.

The American Water Works Association and the Water Environment Federation have developed operator training programs. These training programs are in the form of CD-ROM packages, video teleconferences and on-line courses.

3.4 Environmental Officer Accreditation and Training

The MOE Environmental Officer position is responsible for diversified industrial, municipal and private pollution abatement, water supply and waste disposal. The officers carry out inspections and investigations and recommend remedial and/or legal action.

The requirements for the position include relevant experience and extensive knowledge of the theory, principles and practices in the environmental field as well as knowledge of the Ministry legislation, guidelines, policies, procedures and programs.

Prior to 1986, environmental officers participated in the same training as municipal operators. Starting in 1986 specific courses relating to potable water and municipal wastewater were developed for environmental officers. These courses are offered periodically and were attended by most environmental officers. They were not mandatory. As of 2000, all new inspectors must complete three weeks of training prior to receiving their provincial officer designation.

4. PRACTICES IN NORTH AMERICA

4.1 Operator Certification

Certification programs for water and wastewater operators in North America date back to 1918 when the New Jersey legislature passed the first operator certification law. The basic concept was that the operation of water and wastewater utilities is too important to be trusted to amateurs and should be restricted to those people who can demonstrate their competence in the field. This gave birth to the concept of operator certification programs. A certification program is not meant to confirm the ability of a person to operator a particular process or piece of equipment. Rather, certification demonstrates that the operator understands basic principles. In Canada, the first certification program, a voluntary one, was established in 1966 by the Western Canada Water and Sewage Conference (now the Western Canada Water and Wastewater Association) for the three Prairie Provinces.

In 1972, in the United States, the Association of Boards of Certification (ABC) was formed. It was supported by the American Water Works Association and the Water Pollution Control Federation (now Water Environment Federation) and its objectives are to:

- Improve and strengthen certification laws;
- Promote certification as a means of ensuring effective operation;
- Define and maintain internationally recognized qualifications for certification in established categories;
- Promote a uniformity of standards and practices in certification;
- Facilitate the transfer of certification between certifying authorities;
- Assist newly created certifying authorities in establishing initial policies and procedures.

In 1972 the Federation of Associations on the Canadian Environment (FACE) and Environment Canada sponsored a Certification, Education and Training Committee to establish a common system of classifying municipal and industrial water and wastewater systems and to evaluate operator qualifications for certification. The committee had representation from each Province and Territory as well as FACE and Environment Canada.

In 1974 the FACE Committee met in Charlottetown, PEI to establish a uniform system of classifying water and wastewater systems and to formulate a procedure for issuing Operator Certificates based on an operator's education and experience. The Executive Director of ABC was invited to attend as a guest and a resource. That meeting produced guidelines for certification programs. All of the Provinces and Territories agreed to adopt the guidelines with allowances for variations for local conditions or situations. All of the certification programs in Canada, whether voluntary or mandatory, still employ the basic guidelines developed in Charlottetown. Excerpts from the records of the Charlottetown meeting are attached as Appendix 6.

The two groups (FACE and ABC) worked independently toward the same goal. The Canadians made a fresh start while the Americans tried to set standards and develop a model program that would satisfy the needs of many existing programs as well as provide a template for new programs.

The Provinces and Territories had been invited to join ABC as full members but declined because the system that ABC developed was considered to be inadequate. The ABC system did not give each authority the right to make minor adjustments and did not properly address smaller systems. When the decision and the reasons were communicated to ABC, the ABC leaders decided to take another look at their system and to use input from the FACE Committee to make changes. From that point on, the ABC standards met the needs of the Provinces and Territories and most of the Provinces and Territories joined ABC. In 2001, Canadian members of ABC are:

Ontario Water and Wastewater Operator Licensing Program
Alberta Environment
Northern Territories Water and Wastewater Association
British Columbia Environmental Operators Certification Program
Saskatchewan Operator Certification Program
Manitoba Water and Wastewater Association
Atlantic Canada Water and Wastewater Voluntary Certification Program

The Federation of Associations on the Canadian Environment was eventually dissolved and a new group, the Canadian Water and Wastewater Association (CWWA) took the committee under its wing as the CWWA Technical Committee on Training, Education and Certification.

Since the original guidelines were developed in 1974, the Canadian certifying authorities have agreed to incorporate them into their program guidelines. As members of ABC, they have had the opportunity to revise their guidelines, as new information becomes available. All guidelines are still very similar. ABC published a document titled "Operator Certification Program Standards April 1999". The sections on Qualification for Certification, Points Classification System, Very Small Water Systems, Water Treatment Plant Point Rating System, Wastewater Treatment Plan Point Rating System, Distribution and Collection System Point Ratings and Operator Education and Experience Requirements have been attached as Appendix 2.

The CWWA Certification Education and Training Committee continues to be active and meets approximately every 2 years (depending on funding) to review Canadian Program Standards and to ensure similarity of programs across Canada. A Reciprocity Agreement was developed and agreed to by all certifying authorities in Canada. This reciprocity agreement will facilitate the movement of operators from province to province and will help to ensure consistency among the Canadian programs.

The Reciprocity Agreement is attached as Appendix 3.

4.2 Certification Advisory Committees

Every operator certification program in North America utilizes an advisory committee or board to provide advice and/or direction to the regulatory agency. In some cases, BC for example, the Operator Certification Board administers the program on behalf of the regulatory agency. Committees or Boards are either elected by the certified operators themselves or appointed by the regulatory agency.

The ABC Operator Certification Program Standards recommend that a certification program should be governed by a certification board with stature such that its recommendations will be respected by the regulatory agency(ies).

ABC also recommends that a certification board (or advisory committee) should include at least:

- representation from the provincial regulatory agency
- representation from local government management (not elected) responsible for health or environmental issues
- representation from a post secondary institution that offers related education programs
- representation from operators holding valid certificates.

4.3 Operator Training

Operator Training Programs in North America have developed from many beginnings and have gone in many directions. The main sources of training for water and wastewater operators are:

- Universities
- Colleges
- Technical institutes
- Utilities
- Federal/Provincial/State agencies
- Operator Associations
- American Water Works Association (and its Sections)
- Water Environment Federation (and its Member Associations)
- Environmental Training Centers
- Private Trainers

Post secondary education in the water and wastewater field is provided by many universities, colleges, and technical institutes. Many of the graduates become involved in operations, often at management levels. These providers, as well as all of the others listed, also deliver training that is continuing education or a "short course" type of training.

The USEPA Clean Water Act (1977), an amendment of the Federal Water Pollution Control Act (1972), when imposing stricter standards on water quality, authorized the EPA Administration to provide funds to plan, develop, strengthen, improve or deliver training for persons involved in water quality control. Further, the Administration was authorized to provide up to $500,000 per state for the development of Environmental Training Centers. This assistance helped many US states to develop or improve operator training.

Although Environment Canada developed some training packages for wastewater treatment plant operators and Health Canada provided some funding for water treatment operator training manuals, there has been no consistent federal support for water and wastewater operator training in Canada. Training has been provided by institutions, associations, and private trainers on an "as needed" basis. Some provincial governments have provided training opportunities as an agency function, but these have been minimal. Many utilities have provided training for their own employees. This is especially true in larger municipalities or for contract operators such as OCWA.

4.4 Regulator Accreditation

Most jurisdictions in North America have a requirement for post-secondary education (or equivalent) for regulatory staff. A typical job description would include:

- "A technical position responsible for planning and conducting compliance inspections of municipal water and wastewater operations, waste management facilities and industrial facilities…. Prepare inspection reports, summarize and recommend the appropriate action be taken when warranted….. respond to complaints on environmental matters, follow up environmental incidents and provide support to sampling programs."
- "Qualifications are a related technical degree/diploma in environmental, civil, chemical, or biological areas with extensive experience in operations."

Beyond a related degree/diploma there is no accreditation required in most cases. Training and continuing education are at the discretion of the employee and employer.

5 COMPARISON OF THE ONTARIO SYSTEM TO THE INDUSTRY STANDARD

5.1 Operator Certification Requirements

The Ontario Water and Wastewater Operators Licensing and Facility Classification Program compares very favourably with other programs in Canada and the US. With exceptions for regional differences, the program follows the Program Standards published by ABC.

The facility classification system and the operator certification pre-requisites are comparable and the examinations are developed based on the same psychometric principles as recommended by ABC and as used by the other Canadian provinces.

The following table from the Ontario Program Guide shows the requirements for the various levels of certification:

Table 1

Current Operator Certification Requirements in Ontario

Class	Education	Experience	Examination	Other Comments
Operator in Training	Grade 12 or equivalency	No requirement	Pass – 70%	Note: Operators may only advance one level at a time.
Class I	Grade 12 or equivalency	1 year of experience as an operator in that type of facility	Pass – 70%	Substitutions do not apply, operators must have one (1) full year of valid operations experience.
Class II	Grade 12 or equivalency	3 years of experience as an operator in that type of facility	Pass – 70%	Operators must have a Class I licence for that type of facility in order to apply for a Level 2 upgrade.
Class III	Grade 12 or equivalency, and 2 years (90 CEUs) of additional related education or training.	4 years of experience as an operator in that type of facility with at least 2 years as OIC* in Class II, III or IV facility	Pass – 70%	Operators must have a Class II licence for that type of facility in order to apply for a Level 3 upgrade.
Class IV	Grade 12 or equivalency, and 4 years (180 CEUs) of additional related education or training.	4 years of experience as an operator in that type of facility with at least two years as OIC* in Class III or IV facility	Pass – 70%	Operators must have a Class III licence for that type of facility in order to apply for a Level 4 upgrade.

**OIC – Operator in Charge*
+CEU – A Continuing Education Unit is equivalent to ten hours of approved relevant training.

Note: Professional Engineers can write certification exams and if they receive a mark of 85% or higher, the experience requirement can be waived.

This is essentially the same as the qualifications prescribed by ABC which are summarized in the following table:

Table 2

ABC Recommended Operator Certification Requirements

Class	Education	Experience	Examination
Small Water Systems	6 hours training	6 months	pass 70%
Class I	Grade 12 or equivalent	1 year operating experience	pass 70%
Class II	Grade 12 or equivalent	3 years operating experience	pass 70%
Class III	Grade 12 or equivalent 2 years post-secondary or 90 CEUs*	4 years operating experience 2 years charge experience	pass 70%
Class IV	Grade 12 or equivalent 4 years post-secondary or 180 CEUs*	4 years operating experience 2 years charge experience	pass 70%

**CEU – A Continuing Education Unit is equivalent to ten hours of approved relevant training.*

With both systems a number of substitutions are permitted. This is common with all programs. With many programs, there is an allowance for the substitution of additional years of experience for high school education. Ontario's program was one of these. Many jurisdictions are moving away from this practice and requiring an actual high school diploma or General Education Development (GED) diploma. Alberta, for instance, initiated this requirement in 1991, although before that, substitution of experience for high school education was permitted. In 1994 Ontario allowed the substitution of additional years of experience for education. As of July 2001 only a high school diploma (or equivalent) is accepted. The Director may make exceptions in special cases. In cases of "equivalencies", it has been left up to the education system to make a determination. In Ontario, the Ontario Ministry of Training, Colleges and Universities determines equivalency standards.

5.2 Grandfather Certificates

The ABC program standards do not address "grandfather" certification. In the "Final Guidelines for the Certification and Recertification of the Operators of Community and Non-transient Non-community Public Works System" the US Environmental Protection Agency said:

> *EPA recognizes that there are many competent small system operators that may not meet the initial requirements to become certified. EPA believes that States may need a transition period to allow these operators to continue to operate the system through "grandparenting". It is recommended that grandparenting determinations be based on factors such as system compliance history, operator experience and knowledge, system complexity, and lack of treatment.*
>
> *If States choose to include a grandparenting provision in their programs, they must include the following requirements:*
>
> - *Grandparenting is permitted only to existing operator(s) in responsible charge of existing systems which, because of State law changes to meet these guidelines, must for the first time have a certified operator.*
> - *The system owner must apply for grandparenting for the operator(s) in responsible charge within two years of the effective date of the State's regulation.*
> - *The certification for the grandparented operator must be site specific and non-transferable to other operators.*
> - *After an operator is grandparented, he or she must, within some time period specified by the State, meet all requirements to obtain certification renewal, including the payment of any necessary fees, acquiring necessary training to meet the renewal requirements, and*

demonstrating the skills, knowledge, ability and judgement for that classification.

- *If the classification of the plant or distribution system changes to a higher level, then the grandparented certification will no longer be valid.*
- *If a grandparented operator chooses to work for a different water system, he or she must meet the initial certification requirements for that system.*

In Ontario, as was the case in most jurisdictions, grandfather certificates were issued so that persons who were employed as operators when the program was introduced did not lose their jobs. This helped the regulators and legislators to implement the programs with a minimum of opposition from operators and water authorities. In most cases, the legislation would not pass without this option.

Generally, the grandfather certificates were granted with no restrictions, except that the operator remain at the facility where he/she had obtained experience. In some cases, there was a set time period for the operator to meet the education, experience and examination requirements.

Ontario has a system whereby the earlier grandfathered operators were allowed to keep their certification merely by renewing. The operators who received grandfather certificates after February 1, 1994 were required to pass the appropriate class of exam or their certification class would be lowered one level.

5.3 Renewal and Continuing Education

ABC program standards recommend that an operator renew his/her certificate every two years. In order to do this he/she must be active as an operator for at least 20% of the renewal period and obtain at least twenty-four contact hours of approved relevant continuing education during the renewal period.

The USEPA Final Guideline requires that each State determine a renewal period not to exceed three years and require all operators (including grandfathered) to acquire a prescribed amount and type of continuing education.

Operator certificates in Ontario must be renewed every three years. Operators must verify operating experience within the previous five years in order to qualify for renewal. As well, there is a requirement that employers must provide 40 hours of training per year for certified operators. The type of training and the appropriate documentation is left to the employer. The documentation that the municipal facility owner must keep includes: names and positions of operators who attend training sessions, the date of training session, the duration of each training session and the subjects considered in each training session. (Section 17, Ontario Regulation 435/93 – Appendix 7). Compliance with this requirement is inconsistent and difficult to monitor and enforce. Many of the smaller communities have difficulty meeting the requirements.

In addition to the 40 hours of training currently required, MOE has proposed that there be a requirement for each operator to obtain 36 hours of Ministry approved continuing education during the three year renewal period. It will be the responsibility of the operator to obtain this training.

The Ontario Notice of Proposals for Registration – Water and Sewage Works is attached as Appendix 8.

5.4 Training

Across North America there is no standard for training to develop water and wastewater facility operators. The Water Environment Federation has made a proposal to the American Water Works Association and the Association of Boards of Certification to develop standards for training, or a curriculum, for water and wastewater facility operators. This would satisfy the need for a comprehensive program to provide operators with the knowledge, skills, ability and judgement to properly operate their water facilities.

Ontario (and ABC) certification exams are psychometrically sound and are based on well designed job analyses to ensure that operators have minimum knowledge. Comprehensive training would assist them to pass the exams as well as to become more professional at their jobs.

Although comprehensive training curricula are not available in Ontario, there are many opportunities for operators to obtain training. The Ontario Program Guide and Resource Guides give many references for courses and study material. As well, OWWA has initiated management training and, in cooperation with the Ministry of Training, Colleges and Universities, an apprenticeship program for operators.

The problem in Ontario, as in most of North America and especially the rest of Canada, is that even though there is a need, there is not sufficient demand for training to make it financially viable for any provider to offer a comprehensive training program. This is the problem that WEF and AWWA are intending to address. The other concern is that training often

addresses exam preparation only. Although exam preparation and improved job performance should require the same training, there seems to be too much emphasis on passing certification exams and not enough on improving job performance.

The problem of lack of available training has been exacerbated in Ontario by the loss of past MOE financial support for training. The OWWA supports the AWWA statement of policy (Appendix 7) which recommends that:

> "each water system adopt personnel development provisions that authorize adequate time and funding for the training of personnel at all levels of the system's operation."

This type of provision would include general education programs, training for certification exams, process and equipment specific training as well as continuing education programs.

5.5 Program Staffing and Funding

The ABC program guide recommends:

> *Staffing*
>
> *The certification program shall be furnished with adequate staff to administer the program under the direction of the certification board. Duties which apply only to the certification program include those related to processing applications, administering exams, and issuing and renewing certificates.*

For certification duties alone, there should be at least one staff member per 1,000 active certificates. Staff requirements will vary widely depending on program requirements such as whether the program is changing; whether data processing is used; the amount of time devoted to the program by certification board members; and the method of preparing, administering and scoring exams. For programs with 500 or more certificates, it is more efficient to utilize data processing to maintain records of active certified operators, renewals, and compliance status of utilities and the work force with certification requirements.

The certification officer is responsible for managing the certification program and should be properly qualified to handle all day-to-day business. He/she prepares material for certification board meetings; receives fees and deposits them in the proper account; sends out applications as requested and processes the completed applications; schedules and announces exam dates and locations; arranges for administration and scoring of the exams; issues the new certificates and renewals as directed; and tracks compliance of utilities and employees with the certification law and regulations.

Funding

Such sums as may be necessary to carry out the provisions of the certification program shall be appropriated.

The certification program should establish the fees at the level necessary for the certification program to be self-supporting, at least to the extent of direct costs. Fees may be charged for application, exam, re-examination, and renewal.

All fees received for certification shall be kept in a designated fund available for use by the certification program only.

The USEPA Guidelines echo this with:

Resources Needed to Implement the Program

States must provide sufficient resources to adequately fund and sustain the operator certification program (components include, but are not limited to staff, data management, testing, enforcement, administration, and training approval). EPA recommends that States establish a dedicated fund that is self-sufficient.

Ontario has approximately 6500 certified operators. This does not include approximately 4000 people who hold "Operator-in-Training" certification. These numbers include both water and wastewater facility operators since the program handles both. It should also be noted that some people hold more than one certificate.

Therefore, using the ABC recommendation, Ontario should have approximately eight full time staff to administer the program. Ontario has the equivalent of five full time positions with an operating budget of approximately $500,000.00. This includes the OETC contract staff as well as MOE staff who oversee the program. The staffing in Ontario falls short of the ABC recommendations.

Between 1996 and 1999 the average annual expenditure for the Certification Program was approximately $450,000.00. The revenue from applications, renewals, exam fees, and study material sales was approximately $275,000.00. The program ran at an annual deficit of about $175,000.00. Even with the MOE

contribution of approximately $90,000.00 per year, the Program is running at a deficit and is currently not self-sufficient.

6. CONCLUSIONS

6.1 Operator Certification Program

The Ontario Program is comparable to other programs in Canada and North America. The strengths are:

- that the program is mandatory, and has been since 1994;
- the classification system is accepted across North America;
- the education and experience pre-requisites for all classes are identical to those used in numerous other programs; and
- the exams are developed based on valid need-to-know criteria.

The weaknesses of the certification program are:

- there is a “grandfather” program for certified operators who did not meet minimum qualifications;
- resources allocated do not meet ABC recommendations;
- the renewal process does not require continuing education;
- substitution of experience for education was permitted for a high school diploma;
- the rules of the Certification Program are not consistently enforced; and
- program fees are not sufficient for the program to be self-supporting.

Even though these points are listed as weaknesses, it should be noted that many programs in North America have similar problems. Only with the 1996 reauthorization of the US Safe Drinking Water Act were the States required to have a continuing education requirement for certification renewal.

As well, the ABC Program Standards and the USEPA Guidelines allow substitution of experience for a high school diploma. Many US States and all other Canadian jurisdictions (except Alberta) allow these substitutions.

6.2 Training

The training programs available in Ontario compare to most in the US and are superior to other programs in Canada. The one negative aspect is that training previously offered by the Ontario Government was discontinued. That training was well entrenched and left a noticeable gap when it was gone. The community college network and private industry are not able to fill the void. Training activity did increase for a period of time at the colleges but then dropped off. The reason for this trend is due to many factors with one being the cost and the unwillingness of water authorities to pay market value for training when they were accustomed to training which was subsidized by the Province.

Training is not a prerequisite for certification. It is expected that the exam will require the operator to have sufficient knowledge to operate the system. The vehicle that the operator uses to obtain that knowledge is up to each individual. The table in Appendix 4 shows that of 78.6% of the States and Provinces responding to a recent survey did not require any training before an operator could be certified. The exceptions are the small system certificates that are handled as special cases.

The table in Appendix 4 also shows that 34 out of 42 jurisdictions that responded require continuing education or training for certification renewal. All of the ones that didn't were in Canada since USEPA requires that all certification programs require continuing education for renewal.

6.3 Regulator Accreditation

The background education and experience of the MOE employees who regulate and inspect municipal facilities meets all generally accepted standards. As well, specific training is made available by MOE.

The inspectors are required to inspect a variety of municipal and industrial facilities. This means that they must be experienced and current in a variety of technologies. Usually, this results in being strong in none, or few, of the areas of responsibility.

The training provided for MOE inspectors is available periodically and was not mandatory. This meant that an inspector could be conducting inspections for months before receiving technical training specific to certain facilities. In 2000, the training requirement was changed so that all new inspectors must complete three weeks of training prior to being designated as provincial officers.

6.4 Testing Laboratory Accreditation

Prior to 2000, the Ontario Drinking Water Objective stated that municipalities were “strongly encouraged” to use accredited labs for the testing of potable water supplies.

In 2000, MOE instituted a requirement that all persons doing “operational water tests” in the facility must hold a water treatment, water distribution or water quality analyst licence. Further, the Ministry initiated changes to regulations that would require all laboratories and water treatment plant testing facilities which perform tests on drinking water to be accredited by an agency such as the Canadian Association of Environmental and Analytical Laboratories (CAEL).

The water quality analyst licence is included in an Ontario Notice of Proposal for Registration – Water and Sewage Works. This document is attached as Appendix 8.

Assuming these changes will be made, there should be adequate assurance that laboratories performing tests on potable water will be reliable.

7. RECOMMENDATIONS FOR CORRECTIVE ACTIONS

The Ontario Water Works Association and the Ontario Municipal Water Association recommend that in its final report to the Ontario government on certification and training matters, the Commission recommend the following:

7.1 Certification

1. **The Ontario Government should continue to support mandatory certification of persons performing operational work in water treatment and distribution facilities.**

   Further:

   - All applicants for an operator's licence should have a high school diploma or specified education equivalent.

     The three basic requirements of certification are education, experience and examination. It is based on the premise that each supports the other. Formal education is required to provide the necessary building blocks for learning and the associated problem solving skills. Experience is necessary so that the individual can relate knowledge to

specific operating conditions. Finally, an examination assures certain knowledge. None of these stand-alone. If operating experience can be substituted for high school education, one of the three components is then missing. Even though most certification programs in North America started off allowing the substitution of experience for high school education, many are now requiring a high school diploma (or specified equivalent) for the entry level of certification.
(MOE through the designated Director should continue to have discretion to consider equivalencies in special cases).

- All operators should have continuing education as a condition of licence renewal.

  MOE has proposed a requirement that all certified operators obtain at least 36 hours of approved related training in each three-year renewal period. If this is adopted, the recommendation will have been met and the Ontario program will have requirements similar to US programs. (This is in addition to the current requirement of a minimum of 40 hours per year of professional development)

- All persons involved in water system operations should be encouraged to gain certification.

  When all persons involved in operations are certified, the water authority has greater assurance that the water system is being operated to its optimum level at all times. This would also provide certified operator back up for all eventualities.

2. **The Ontario Government should require all applicants for an operator's licence at the entry level to complete a training course with a specific curriculum.**

   The entry-level mandatory course would ensure that all certified operators had been exposed to, and demonstrated knowledge of, the basic principles involved in their job duties. The certification exam is intended to provide assurance of this knowledge. But, it is possible for an operator to pass the certification exam with no knowledge or experience in one or more specific subject area.

   The reluctance to require this type of course is natural. The challenges are many including resources, administration, delivery, geography and enforcement.

   There are many ways to meet these challenges. Suitable course materials can be developed if the necessary resources are provided. From then on, the process should be self-supporting. Delivery can be provided in many ways such as classroom courses, correspondence courses or on the Internet.

3. **The Ontario Government should update the mandate for the Water and Wastewater Operator Certification Advisory Committee.**

The Advisory Committee was first established in 1987. In 2001 the makeup of the Committee was revised. The further step of updating the mandate and role of the Committee should be undertaken. All stakeholders should be involved in the process.

4. **The Ontario Government should ensure the Ontario Water and Wastewater Operator Certification Program is adequately staffed to meet ABC standards and that the program is self-financed.**

In the past four years the program has run at a deficit. The fees should be adjusted so that the program becomes self-supporting.

The areas where fees apply are: facility classification, application for certification, certification examination, certification renewal and the sale of operator certification/training related materials.

5. **The Ontario Government should have a system to monitor training and continuing education for operator re-certification.**

This system must ensure that water authorities are providing the minimum required training per year as required by Ontario Regulation 435/93 and that operators are obtaining the minimum required continuing education units (CEUs) to be re-certified as currently proposed in the amendment to Ontario Regulation 435/93.

In order to maintain the integrity of the program, the rules must be enforceable and must be enforced. To date, the rules of the Certification Program have not been consistently enforced.

6. **The Ontario Government should work with appropriate stakeholders to ensure private water system operators are adequately trained and certified.**

The main clients/stakeholders of the Certification Program are water authorities that serve municipalities. The water systems that serve private developments that fall under the legislation must also be included.

7.2 Training

1. **The Ontario Government, in collaboration with water utilities and other appropriate stakeholders (i.e. OWWA, OMWA, WEAO, AMO, MEA, PEO, OSPE, private trainers, etc.), should establish competence-based training and career development programs for water (and wastewater) utility staff.**

The Ontario Government must take the lead in this initiative and provide funding, if necessary, to bring the stakeholders together to form a workable partnership. The Government should also have regard for programs being initiated by OWWA including the Water Distribution System (and Wastewater Collection System) Operator Apprenticeship Program and the Water Utility Management Institute of Ontario. Training

in specialized areas such as water treatment process optimization, and microbiological factors must also be recognized.

2. **The Ontario Government should conduct a gap analysis to determine the long-term training and capacity development requirements of the water works industry.**

   It is necessary to use a comparison of existing training and the required training offerings in order to develop workable plans. The actual numbers of grandfathered operators who have not yet passed an exam also needs to be assessed in order to determine the training needs for this group of operators.

3. **The Ontario Government should establish a mandatory water supply training course for regulatory staff and public health officials.**

   MOE has recently changed its policy so that all inspectors must complete three weeks of training prior to receiving their provincial officer designation. This practice should continue and be extended to include public health officials who are responsible for potable water supplies.

4. **The Ontario Government should provide guidance to water utilities regarding "how to" get CEU training approved for utility staff.**

   The Ontario Government should provide a program to assist water utilities to develop training and to have it approved for the education and continuing education requirements of the certification program.

5. **The Ontario Government should provide guidelines and require water utilities to adopt personnel development provisions that authorize adequate time and funding for the training of personnel at all levels of the system's operations.**

As part of the overall management of a utility, professional development of all staff is critical. Specific requirements for programs and sufficient direction will foster development of good personnel training programs.

8 Financial Implications of the Recommendation

8.1 Certification Program

- The certification program is currently understaffed and underfunded. Especially if additional training is required for certification and certificate renewal, additional staff will be required.

- The monitoring and enforcement functions need to be enhanced. Two additional FTEs, either with the Ministry or another agency, are required.

- A system to monitor continuing education and training for operator re-certification needs to be developed. This system must ensure that water authorities are providing 40 hours of training per year and that operators are obtaining 36 hours of Ministry approved training every three years.

8.2 Training Program

- A basic entry-level training package for new operators and operators who hold grandfather certificates is needed. It should be developed in conjunction with industry stakeholders.

- The Government of Ontario needs to develop and maintain the network to deliver training that will be required by the Certification Program Rules.

- The Government of Ontario needs to develop, and continue to develop, training materials for use by all trainers in Ontario.

APPENDIX 1

ONTARIO WATER AND WASTEWATER OPERATOR LICENSING & FACILITY CLASSIFICATION PROGRAM GUIDE

Appendix 1

Ontario Water And Wastewater Operator Licensing &
Facility Classification Program Guide

This guide contains all the information and applications necessary to apply for Facility Classification and Operator Licensing. Please read the text carefully before completing the application.

If you have any questions you can reach the Certification Office at (905) 796-2851.

Contents:

WATER AND WASTEWATER UTILITY OPERATOR LICENSING PROGRAM

INTRODUCTION:

Regulation 435/93 enacted July 26, 1993 created a mandatory licensing system for operators of drinking water and domestic sewage treatment facilities in Ontario. The change to a mandatory licensing from a voluntary certification program was made by regulation under section 75 of the Ontario Water Resources Act. The program establishes recognized professional standards for operators; gives greater assurance of good and safe drinking water to the residents of Ontario; provides greater protection of the aquatic environment; assures efficient and safe use of operating facility; provides for optimum utilization of public money spent on water and wastewater utilities; and increases professionalism of an important environmental occupation. Ontario's licensing program is a mandatory program based upon the model provided by the Association of Boards of Certification (ABC). ABC is an association which provides guidance and resources to certification authorities across North American.

HISTORY OF OPERATOR CERTIFICATION/LICENSING IN ONTARIO:

The voluntary program established in 1986, was designed as a bridge to work out the details of the mandatory program and allow for consultation with all of the stakeholders. The voluntary program was the product of extensive consultation with various interest groups. Beginning in 1987, with the creation of the Advisory Board of Certification, there has been direct participation in the process by a number of professional organizations and bargaining units.
The licensing program, which has been voluntary since 1986 involves over 7,000 operators across Ontario. Approximately 4,000 operators were certified under the voluntary program and 3,000 under the mandatory program. To date approximately 15,000 licences have been issued.

WHO IS ELIGIBLE?

Any person may apply for a licence, but only operators who meet all of the program's requirements will be issued licences (see Table 1). Please note that operating experience in the type of facility is a requirement for a Class I, II, III and IV licence. Grade 12 or equivalent is also required.

ADVISORY COMMITTEE:

An Advisory Committee on Water/Wastewater Operator Certification has been established to provide the Ministry with expert advice from operators and owners. The committee meets 2-3 times a year to advise the Ministry on policy issues and individual operator concerns. The Ministry has invited representatives from the associations and bargaining agents active in the water and wastewater industry. Your representatives are:

American Waterworks Association - Ontario Section:
Judy MacDonald (905)825-6123 ext. 7648 E-mail macdonaj@region.halton.on.ca

Association of Municipalities of Ontario:
Christopher Woods (519) 253-7111 ext. 383

Canadian Water and Wastewater Association
Liz Marland (613)724-4244 ext. 2245 E-mail marlandli@rmoc.on.ca

Canadian Union of Public Employees
Currently no representative

Ministry of the Environment
Janet O'Grady (416) 314-9305 (Director)
Ben Campbell (416) 314-9331 (MOE Certification Representative)

Municipal Engineers Association
Bernie Kuslikus (905) 668-7721 E-mail kuslik_b@region.durham.on.ca

Ontario Clean Water Agency
Ed Chin E-mail echin@ocwa.com

Ontario Municipal Water Association
Max Christie (613)354-9338

Ontario Public Service Employees Union
Marie Thomson (519) 238-8466

Water Environment Association of Ontario
Eldon Wallis (705) 326-1066

Western Lake Ontario Training and Certification Group
Peter Bziuk (519)253-7111 ext. 229 E-mail pbzuik@city.windsor.on.ca

The Ministry will continue to involve those operators and owners who wish to offer advice on the future direction of the licensing program. The Ministry encourages you to become involved, or to contact the Committee representatives, and help shape the future of the operator profession in Ontario.

OPERATOR DEFINITIONS AND OPERATOR RESPONSIBILITIES:

All operators performing operational work must be licensed. Any other person in a facility performing operational duties is also required to obtain a licence, regardless of their job classification. For example, a maintenance worker or a laboratory technician who is placed on call, and is expected to perform operational duties during this time must be licensed. Licensed operators for the purposes of training or delegation of duties, may allow non-licensed operators to perform operational work. This is **conditional** on a licensed operator being physically with the non-licensed operator as the work is performed. The licensed operator must clearly instruct the non-licensed operator on the correct procedures. Any work performed will be the responsibility of the licensed operator.

Section 1 of the regulation defines an "operator" to "*mean a person who adjusts, inspects or evaluates a process that controls the effectiveness or efficiency of a facility, and includes a person who adjusts or directs the flow, pressure or quality of the water within a water distribution facility or the wastewater within a wastewater collection facility*."

The regulation has a number of other definitions (see the glossary of terms at the end of the program guide). Some of the more important ones are listed below:

Operator-In-Training:

An Operator-In-Training (OIT) is generally an operator who has less than one year of experience. An OIT licence allows operators with less than 1 year of experience to attain the experience required to become a Class I operator. Once the knowledge and experience have been obtained, operators are expected to write their Class I examination.

Becoming an Operator-In-Training requires the successful completion of the Operator in Training exam. The exam may be invigilated by superintendents, supervisors or at colleges across the province.

The Operator-In-Training Licence allows the operator to perform all regular operating duties. However, an Operator-In-Training cannot be the operator with overall responsibility for the facility as of October 1998, OIT's cannot collect Operator-In-Charge experience. **Please Note:** Anyone who performs analytical tests on Ontario Drinking Water Standards parameters that may be performed at a water works must be licensed. Their licence must be that of a Class I, II, III, or IV water treatment or water distribution operator, or a water quality analyst.

Operator-In-Charge:

An Operator-In-Charge is any operator who:

- is responsible for the overall operation of a facility; or
- sets operational parameters for a facility or for a process that controls the effectiveness or efficiency of a facility; or
- directs or supervises operators in a facility.

The Operator-In-Charge is responsible for:

- taking all steps reasonably necessary to operate the processes within his or her responsibility in a safe and efficient manner;
- ensuring that processes within his or her responsibility are measured, monitored, sampled and tested in a manner that permits them to be adjusted when necessary;
- ensuring that records are maintained of all adjustments made to the processes within his or her responsibility;
- ensuring that all equipment used in the processes within his or her responsibility is properly monitored, inspected and evaluated and that records of equipment operating status are prepared and available at the end of every operating shift.

Operators-In-Charge do not need a licence at the level of the facility.

Operator in Overall Operational Responsibility:

An **owner** must ensure that every facility has designated an "operator in overall operational responsibility". This operator must be licensed to the class of the facility or higher. This requirement ensures that knowledgeable, experienced staff are available at all times to provide advice to any plant operator and to respond to any emergency. For example a Class III wastewater treatment system requires an "operator in overall operational responsibility" who holds a Class III wastewater treatment licence.

A facility may identify more than one person with this responsibility (i.e. on a shift-to-shift basis, on a week-to-week basis). Owners may use a "backup" as the operator with overall operational responsibility for up to 150 days per year. These backup operators may be licensed no lower than one Class below that of the facility. Likewise, several different operators identified as the backup may be utilized, on different shifts, provided that the total number of days the backups are used is not greater than 150 per year.

OPERATOR LICENCES:

There are four classes of licences that correspond to the four classes of facilities. There is also an Operator-In-Training licence for new operators. Each licence will be valid only for the type of facility for which it is issued. For example a Class I Water Treatment licence is only valid for working in a Water Treatment Plant. Holders of a water treatment facility operator's licence at any level also hold a Class I water distribution facility operator's licence. Similarly the holder of a wastewater treatment facility operator's licence at any level also holds a Class I wastewater collection facility operator's licence. This provision is included to recognize the overlap of duties operators of treatment facilities must undertake. For these Class I licences no fee is required and no licence is issued.

In order to qualify for an operator's licence a person must meet three (3)requirements:

1. Education
2. Experience
3. Successfully complete exam

The licensing requirements are described in Table 1, page 12. Subsequent pages of the guide will provide details of program requirements, substitutions allowed, and examinations. Please note that *all* operators must pass an exam to obtain a licence.

An operator must submit a completed *Operator-In-Training Application Form* (Appendix 2) or an *Exam Request Form* (Appendix 4), to the Certification Office to apply for an exam to be licensed.

The application forms will provide the Certification Office with verification of your experience and education. All applications will be reviewed and eligible candidates who pass the required examinations will be issued licences. All personal information which the Ministry collects is confidential and is protected by the *Freedom of Information and Privacy Act*.

When completing the Operator application forms please read the instructions to avoid delays in assessment. If an important piece of information is missing from your application it cannot be processed and registration for exams will not be confirmed unless payment is enclosed with your application.

As of February 1, 1994 all operators are required to hold a valid licence. No operators may operate in a facility without a licence after this date. Each licence costs $75.00 and is valid for three years after the date of issue. Licences will be renewed after 3 years if the operator applies for renewal.

Operator-In-Training Licence:

Operators who are beginning their careers will require an Operator-In-Training licence. Unlike the class I - IV licences, the Operator-In-Training licence does not require any previous experience. However, as with all licences, an operator must have completed grade 12 or other education/experience considered equivalent by the Director. Proof of education must be provided to the Certification Office prior to writing the examination.

The examination may be written at any of the MOE examination centres or administered by a supervisor at the operators facility.

The Operator-In-Training examination exam costs $20 and there is no fee for the licence(s). An operator-in-training study guide is available through the Certification Office and costs $20.00. As of October 1998, all OIT licences will have an expiry date of three (3) years and a $75.00 fee will be charged upon renewal for each OIT licence.

Conditional Licence:

A conditional licence may be issued by the Director in some limited cases. These cases include:

1. As a result of a facility upgrade or expansion which changes the classification level of the facility by at least 2 levels, and no existing operators are licensed to a level of the new classification.
2. In small, isolated communities where a person with the proper qualifications can not be obtained.
3. A conditional licence will be valid only in a single facility and may require the operator to complete training, exams or other requirements.

The owner of the facility must request a conditional licence from the Director.

Small Water System Operator Licence:

All drinking water systems which are capable of producing more than 50,000 L per day (7.6 Imp Gallons per minute) must be operated by licenced water operators. In recognition of the limited operating needs of small water systems, the Ministry of the Environment has introduced a new type of licence for operators of these systems. **Please refer to page 7 for further details of the small water system licence.**

RENEWAL OF LICENCE:

It is standard practice for the Certification Office to issue a renewal notice and application to operators sixty (60) days prior to the expiration date of a licence. If an application for renewal is **NOT** returned to the Certification Office in time to allow for processing and return mail, the licence may become invalid. **It is the operators responsibility to notify the Certification Office of any change of address which may delay or prevent delivery of the renewal forms.** Upon renewal the operator will receive a new licence. The expiry date will be printed on the new licences.

Operators who have not obtained any operating or "related" experience in the previous five years, may not renew a licence. These operators may elect to write the appropriate class of exam, and if they pass will be allowed to renew their licence. Related experience includes supervisory, lab or maintenance.

LICENCE UPGRADES:

An operator who is currently licensed may wish to obtain a licence at a higher class. To upgrade the licence to the higher class the operator must pass the appropriate Class exam, meet the experience and education requirements (see Table 1). An operator may obtain a licence only one class higher than they currently hold. For example a Class II operator cannot obtain a Class IV licence, without first obtaining a Class III licence. An operator may only obtain a licence one class higher than the classification of the facility they operate. The grade 12 requirement is waived for operators who were grandparented in 1990 and 1994.

Small Water System Operator Certification

All drinking water systems which are capable of producing more than 50,000L per day (7.6 Imp Gallons per minute) must be operated by licensed water operators. In recognition of the limited operating needs of small water systems, the Ministry of the Environment has introduced a new type of licence for operators of these systems. Previously, operators of small systems were required to obtain a regular Class 1 Water Treatment licence. The requirements for obtaining a Class 1 licence are suitable for a municipal treatment operator but are not appropriate for operators of small systems. The new class of licence will allow operators or small systems to obtain a relevant licence.

Who is eligible for a Small Water System Operator Licence? *

Privately Owned Systems	**Very Tiny Municipal Systems**
If the water system meets ALL of the following criteria, an operator may apply for a Small Water System Operator Licence. • the population supplied by the water system is less than 500 (or equivalent); and • the water system does not use any treatment other than disinfection, water softening or disposable cartridge filtration systems; and • all previous water tests in the past 5 years have shown excellent raw water quality; and • the water supply system is located on private property and is privately owned. Typically, this would include water systems supplying resorts, campgrounds, trailer parks and privately owned communal water works.	If the water system meets ALL of the following criteria, an operator may apply for a Small Water System Operator Licence. • the population supplied by the water system is less than 100; and • the water system does not use any treatment other than disinfection, water softening or disposable cartridge filtration systems; and • all previous water tests in the past 5 years have shown excellent raw water quality. Typically, this would include municipal water systems supplying small hamlets, subdivisions or villages.

* If you do not meet all of the above conditions, you may be required to obtain a regular water treatment operator licence.

Licence Requirements:

- Must be presently employed as an operator of a small water system.
- Must verify grade 10 or equivalent education.
- Must successfully pass the Small Water System Exam.

Cost: The Small Water System Exam costs $50.00. A licence (valid for three years) costs $75.00. The licence obtained will be valid only in the water system(s) which the operator is presently operating.

Recommended Exam Study Materials:

The exam consists of 75 multiple choice questions. Topics include water quality, disinfection, wells and pumps, water testing, and distribution. The ***Small Seasonal Drinking Water Systems*** manual is recommended for preparing for the exam. Copies can be obtained from the certification office for $30.00. Other more detailed manuals may also be used.

More Information:

Contact the Certification Office for further information on the Small Water System Operator Licence:
Ontario Environmental Training Consortium
37 George Street North, Suite 206
Brampton, Ontario L6X 1R5
(905) 796 - 3584
val@tdc.on.ca

EXAMINATIONS:

Eligibility:

Applicants may write examinations one class higher than the class of licence that they hold. An operator can only obtain a licence one class higher than the classification of the facility they operate. The licence cannot be issued until the person meets both the experience and education requirements. To apply to write an examination complete the *Examination Request Form (Appendix 4)*.

Examination application(s)and payment(s) must be received by the Certification Office, at least four (4) weeks prior to the examination date requested. Applicants will receive an examination confirmation letter to confirm their registration and licence eligibility requirements. You will receive your examination mark(s), in the mail, within 30 days after the exam date. Exam marks cannot be given over the phone.

If an applicant fails to attend a scheduled examination, without informing the Certification Office at least two weeks (10 business days) before the date of the exam, he/she will forfeit the examination fee. Rescheduling or canceling the same exam three times, will also result in the loss of your exam fee.

All applicants who have canceled scheduled examination sittings must reapply before an examination will be rescheduled. All applicants who forfeit examination fees must submit a new cheque and *Examination Request Form*, when applying to write a new exam.

Locations:

The Certification Office will notify operators of scheduled examinations in the ***Ontario Certification News***. Every licensed operator and classified facility will receive a copy. In the spring and fall exams are held at various locations across the province including **Barrie, Belleville, Kenora, Kingston, London, North Bay, Ottawa, Sault Ste. Marie, Sudbury, Timmins, Thunder Bay and Windsor**. Examinations are also held at Humber College in **Toronto** on the third Monday of each month, except during July and August.

Examinations may also be held on site upon request of the facility owner. Employers are responsible for arranging for an invigilator who will be approved by the MOE. Employers will be required to pay any facility or invigilation costs for these sessions. Notify the Certification Office to schedule your special exam request. A minimum of three (3) months notification is required. Please note, applicants for special exam sites are on a first come first served basis. The Certification Office can only accept minimal amount of special exams per year.

OWNER RESPONSIBILITIES:

Under the *Ontario Water Resources Act* an owner is defined as "*a municipality or person having the authority to construct, maintain, operate, repair, improve or extend water works or sewage works*".

Facility owners have been given a number of responsibilities under the regulation. These include:

- Filing an application with the Director for the classification of the facility
- Ensuring that every operator holds the appropriate licence applicable to that type of facility or a licence as an operator in training
- Ensuring that responsibility for the overall operation of the facility is placed with an operator who holds a licence that is applicable to that type of facility, and that is of the same class as or higher than the class of the facility. The owner of the facility cannot permit responsibility for the overall operation of a facility to be placed with an operator who holds an Operator-In-Training licence
- Notifying the Director without delay if the owner relies on a temporary substitute for more than 60 days in any twelve month period
- Ensuring that the classification certificate is conspicuously displayed at the facility or at premises from which the operation of the facility are managed

- Ensuring that a copy of the licence of every licensed operator who is employed in the facility is conspicuously displayed at the operator's workplace, or at premises from which the operation of the facility is managed
- Ensuring that operators of a facility have ready access to comprehensive operation and maintenance manuals that contain plans, drawing and process descriptions sufficient to the safe and efficient operation of the facility. The owner shall ensure that the manuals are reviewed and updated at least once every two years
- Ensuring that records are maintained for the amount of time each operator works as an operator in charge, as of October 1998, OIT's cannot gain OIC experience
- Ensuring that logs or other record-keeping mechanisms are provided to record information concerning the operation of the facility
- Ensuring that logs and other record-keeping mechanisms are accessible in the facility for at least two years after the last entry
- Ensuring that every operator employed in the facilities is given at least forty hours of training every year, and that records are kept of this training (see the section of training for more details).

Training:

Regulation 435/93 requires that owners provide every operator with 40 hours of training during every 12 month period. The owner may use any type of training period (i.e. calendar or fiscal as long as it is consistent for all employees). Training may include formal classroom training, hands-on training, conferences or seminars. It can include training on new or revised operating procedures, reviews of existing operating procedures, safety training, computer training and training in related environmental/technical areas.

Staff who are employed on a part time basis are still required to receive training each year. Training for part time staff may be pro-rated, based on the following:

Actual Operating Hours/Week Hours Training Required Per Year

>20 hours per week..... 40 hours/year
15-20 hours per week..... 30 hours/year
5-19 hours per week..... 20 hours/year
<5 hours per week..... 10 hours/year

Training may not be averaged over a number of years (for instance if an operator received 50 hours of training one year, he/she could not be given only 30 hours the next year). Training hours may not be averaged between employees. Training records must be kept by the employer stating the employee name, employee's position, amount of time, date, and topics for each employee in a training session. Copies of these records must be submitted to the Director when requested to do so by the Director.

Facility Logs:

The owner of a facility must ensure that logs or other record-keeping mechanisms are provided to record information concerning the operation of the facility. The only persons allowed to make entries into the log are the operator-in-charge, or those authorized to make an entry by the owner or an operator-in-charge. Entries in the logs shall be made chronologically. All persons making an entry into the log shall do so in a manner that permits the person to be clearly identified as the maker of the entry.

Log entries for each operating shift should contain:

- date, time period and the number or designation of the shift
- names of all operators on duty during the shift
- any departures from normal operating procedures and the time they occurred
- any special instructions that were given during the shift to depart from normal operating procedures and the person who gave the instructions
- any unusual or abnormal conditions that were observed in the facility during the shift, any action that was taken, and any conclusions drawn from the observations
- any equipment that was taken out of service or ceased to operate during the shift, and any action taken to maintain or repair equipment during the shift.
-

FACILITY CLASSIFICATION:

Facilities That Require Classification:

The first step in the licensing process is the classification of the water/wastewater system. An operator may not obtain a licence until the facility has been classified.

The plants and systems in the program are divided into four types of facilities:

Water Treatment
Water Distribution
Wastewater Treatment
Wastewater Collection

In addition to the above four types of facilities a Water Treatment facility maybe classified as a Small Water System. Please refer to page 7 for further information.

Generally, any drinking water plant, domestic sewage treatment plant, water distribution system, and sewage collection system requiring a Certificate of Approval from the Ministry of the Environment are included in the program. Specifically, any water works capable of supplying water for human consumption at a rate greater than 50,000 litres per day must be classified. Privately owned waterworks used to supply five or fewer private residences do not need classification.

Any domestic sewage works treating primarily domestic wastewater, which discharges directly or indirectly to surface water must be classified. Privately owned sewage works serving five or fewer private residences, or those which discharge into a sanitary sewer, do not need classification.

Seasonal Campgrounds/Resorts/Cottage Developments:

Campgrounds or Resorts which are capable of producing less than 50,000 litres of water a day (7.6 imperial gallons per minute) do not require a classification or licensed staff. Campground and Resort drinking water systems which are operated seasonally and are capable of producing more than 50,000 but less than 200,000 litres of water per day may be partially exempt from classification and licensing requirements. To be eligible the campground or resort must:

1. be seasonal: closed for a total of at least one month per year, **and,**
2. have had no water quality problems, **and,**
3. not treat water except by disinfection, the use of softening devices, or disposable cartridge filters, **and,**

the operator/owner that is responsible for the operation of these systems must complete a course entitled "*Operation and Maintenance of Seasonal Drinking Water Systems*" to be eligible for this exemption. To obtain more details about this course, contact Val Plant at OETC (905)796-3584. Campgrounds with water systems capable of producing over 200,000 litres must be classified and be operated by licences operators.

Basis For Classification of Facilities:

Each type of facility requiring classification is classified as Class I, Class II, Class III, and Class IV facilities. The classification is determined using a point system which takes into account such characteristics as size, population served, process and technological complexity, and the state of the water source or the sensitivity of the receiving water, when applicable. A Class I plant will be a fairly simple operation such as sewage treatment plant with only lagoons. A Class IV plant will be a large complex operation, such as one with a three-step sewage treatment system.

An application for the classification of a facility is included at the end of this Guide (Appendix 1). In this form you will find a separate 'schedule' for each of the four types of facilities. There is also a general information page. An authorized representative of the facility owner must complete and submit the classification application. All applications will be reviewed and a classification level assigned, based upon the classification criteria in Schedule 1 of O. Reg. 435/93. A certificate of classification will be sent to the owner of the facility, once it has been assigned a class.

NOTES :

(A) A ground water supply with only "in-line" preventive chlorination and or adjustments such as pH control or iron sequestering is usually considered a water distribution system and not a water treatment facility.

(B) A water distribution system which is located on private property and does not provide its own on-site ground water source is considered a plumbing system. Plumbing systems do not require classification or licensed operators. Special procedures are used for classifying small private water systems which only use preventative chlorination, pH control or iron sequestering.

(C) A wastewater collection system which is located on private property is considered a plumbing system. Plumbing systems do not require classification or licensed operators.

(D) Water systems supplying resorts, campgrounds, trailer parks and privately owned communal water works as well as very small municipal water systems supplying small hamlets, subdivisions or villages may be eligible to be classified as a Small Water System. Please refer to page 7 of the Program Guide for further information or contact Vicki Purvis at (905)796-3766 for further information.

TABLE 1 - QUALIFICATIONS FOR OPERATORS' LICENCES

Class	Education	Experience	Examination	Other Comments
Operator in Training	Grade 12 or equivalency	No requirement	Pass - 70%	Note: Operators may only advance one level at a time.
Class I	Grade 12 or equivalency	1 year of experience as an operator in that type of facility	Pass - 70%	Substitutions do not apply, operators must have one (1) full year of valid operations experience.
Class II	Grade 12 or equivalency	3 years of experience as an operator in that type of facility[1]	Pass - 70%	Operators must have a Class I licence for that type of facility in order to apply for a level 2 upgrade.
Class III	Grade 12 or equivalency, and 2 yrs. (90 CEUs) of additional related education or training.	4 years of experience as an operator in that type of facility with at least 2 years as OIC in Class II, III or IV facility[1]	Pass - 70%	Operators must have a Class II licence for that type of facility in order to apply for a level 3 upgrade.
Class IV	Grade 12 or equivalency, and 4 yrs. (180 CEUs) of additional related education or training.	4 years of experience as an operator in that type of facility with at least two years as OIC in Class III or IV facility[1]	Pass - 70%	Operators must have a Class III licence for that type of facility in order to apply for a level 4 upgrade.

[1]*Certain related experience may be substituted for up to 50% of the experience requirement for a Class II,III, or IV licence.*

NOTE:

(A) 10 hours of training equals 1 Continuing Education Unit (CEU); 45 CEUs = 1 year of post secondary education.

(B) Professional Engineers need 85% to pass an examination.

EXPERIENCE / EDUCATION SUBSTITUTIONS:

Some substitutions are permitted for the requirements in Table 1. Substitutions may be made for up to one-half of the experience requirements for class II, III, or IV licences. Similarly there are some substitutions permitted for up to one-half of the post secondary education or training requirements for class III, or IV licences. The following information is a list of the substitutions that will be considered.

Experience Substitutions:

Experience gained in other jobs may help an operator perform their duties. The Licensing Program recognizes other types of experience, based on the following rules.

1.	Class I	**No substitution permitted.** (This will ensure that a Class I operator has actually worked in the type facility for which he/she has a licence.)
2.	Class II, III or IV	Substitution may be made for up to one-half of the required experience. For example, a Class II licence requires 3 years of operating experience. An operator may substitute up to 1 1/2 years of those 3 years.

Eligible substitutions are listed below:

a. Relevant formal post secondary school education (Community College, Trade School, University) may be substituted for operating or OIC experience. One year of post secondary education is equal to one year of experience or 45 CEUs (1 CEU equals 10 hours of training).
b. Specialized operator training courses, seminars, workshops, technical conferences or in-service training may be substituted for experience requirements. Please note all training must be verified by a certificate, transcript, or letter from the trainer.
c. Partial credit toward operating experience may be given for experience in other types of facilities, or in other job functions within a facility (ask the Certification Office for a list of substitutions). For example, some operating experience in wastewater treatment plant can be used when you apply for a Class II, III or IV water treatment plant. Other allowable substitutions include laboratory work, maintenance work, or other specified trades.

NOTE: Any education used to meet the experience requirement cannot be applied to meet the educational requirement.

Education Substitution:

Operating experience may be used to partially meet the education requirements.

a) A year of valid operating experience may be substituted for two (2) years of grade school, without limitation.

b) A year of valid operating experience may be substituted for one (1) year of secondary school, without limitation.

c) A maximum of one (1) year of OIC experience in a Class II (or higher) facility may be substituted for one (1) year of post secondary education to meet the Class III education requirement.

d) A maximum of two (2) years of OIC experience in a Class III (or higher) facility may be substituted for two (2) years of post secondary education to meet the Class IV education requirement.

NOTE: Any experience used in substitution for educational requirements cannot also be applied to meet the experience requirements.

The above education substitutions would allow an operator to obtain Class IV experience with a minimum of 2 years (90 CEUs) post secondary education/training, provided the operator has enough OIC experience.

Experience Exemption of Professional Engineer:

A Professional Engineer accredited in Ontario, may obtain a licence without meeting the necessary operating experience requirements. In order for the experience to be waived the professional engineer must obtain a mark of 85% of higher on the appropriate operator licensing exam.

NOTE: Once a Professional Engineer gives up their Peng. status for a licence, they cannot revert back to using their Peng. status for that licence. They have to go through the same procedures and have the same experience and qualifications as an operator to obtain their licence.

Study Materials:

The following pages provide a summary of the study material available for preparation to write operator licensing exams. Operators should refer to the *Resource Guide for Water and Wastewater Facility Operators* for additional information on contents, price and ordering information of guides, manuals and course and reference listings.

Operator Need-To-Know information is available for each exam. The guides were created to help trainers, supervisors and operators determine what topics to review while studying for operator certification exams. The guides break each exam into numerous topics and indicate the level of knowledge required for each exam.

The Certification Office also have videos available to help operators prepare to write exams. The video is entitled "*Secrets to Success: How To Prepare For Operator Certification*" This video is designed for operators who have not written exams for many years. It provides tips on how to study, and how to write exams. Your supervisor may borrow the video from the Certification Office.

To obtain the Resource Guide, Operator Need-To-Know, or Secrets to Success video (which are all free of charge), contact the Certification Office (905) 796-2851.

Study Materials Available Through The Certification Office

Operator-In-Training Examination Study Guide.....$20.00

- Prepared by Ontario Municipal Water Assoc. & Ministry of the Environment
- study guide covers all four categories in one manual

Alberta Water & Wastewater Operations Manual Level 1..... .....$75.00

- Prepared by Western Canada Water & Wastewater Assoc.
- manual covers all four level 1 categories (WT,WD,WWT,WWC)

Alberta Water & Wastewater Operations Manual Level 2..... .....$75.00

- Prepared by Western Canada Water & Wastewater Assoc.
- manual covers Water Treatment and Wastewater Treatment level 2

Sample Examination Questions

Operator Certification Study Guide.....$40.00

- Prepared by the American Water Works Assoc. (AWWA)
- guide covers sample questions, level 1-4, in Water Treatment & Water Distribution

Certification Study Guide for Wastewater Treatment Personnel..... .....$40.00

- Prepared by the Water Environment Federation (WEF)
- guide covers sample questions, level 1-4, in Wastewater Treatment

Certification Study Guide for Collection Systems Personnel..... .....$40.00

- Prepared by the Water Environment Federation (WEF)
- guide covers sample questions, level 1-4, in Wastewater Collection

Ministry of the Environment Study Material

Mathematics for Water & Wastewater Operations..... .....$20.00

California State University Correspondence Courses

California State offers a variety of water & wastewater correspondence courses for operators and managers. Upon completion of each course you will receive a Certificate of Completion plus you earn Continuing Education units (CEUs), per course. For further information contact California State University (CSU), at (916) 278-6142 or visit their website at http://www.owp.csus.edu

HOW DO I GET MORE INFORMATION:

If you require more information or would like to would like to receive a Program guide, Resource Guide, Need-To-Know, copies of O. Reg. 435/93, or order manuals, please contact the Certification Office:

Ontario Environmental Training Consortium
37 George Street North, Suite 206
Brampton, Ontario
L6X 1R5
Call (905) 796-2851
Fax (905) 796-8744

Certification Office Staff
Vicki Purvis -- Certification Manager and upgrades (905) 796-3766 or e-mail vicki@tdc.on.ca
Val Plant -- Facilities, OIT exams, leveled exam marks (905) 796-3584 or e-mail val@tdc.on.ca
Anita Petrov -- Exam applications and renewals (905) 796-3610 or e-mail anita@tdc.on.ca
Aneta Ludwig -- General Information, order forms, web (905) 796-2851 or e-mail aneta@tdc.on.ca

FEE STRUCTURE

The appropriate fees must be enclosed with your applications. Please make cheques or money orders payable to "**Ontario Environmental Training Consortium"** or "**OETC**". Note, examination registration, renewals, upgrades, or study material ordering will **NOT** be processed unless payment is received with your application. Applications paid for by VISA will only be processed if all of the information found on the application is filled out.

Level 1-4 Certification Exams $50/per exam
Issuing of Upgrade Licences $75/per licence
Renewal of all Licences (valid for 3 years)* $75/per licence
Operator-In-Training Examination $20 (licence(s) is included)
Facility Application Forms & Licences no charge
***** As of October 1998, Operator-In-Training licences have an expiry date of 3 years as per O. Reg. 435/93.
When applying for any of the above examinations or licences, please ensure that all documentation, fees, and verification forms are fully completed. Verification of employment (experience forms) must be signed by an authorized representative of the employee.

HOW TO COMPLETE APPLICATION FORMS

Type or print all information clearly, using a pen only. Please keep a copy of all forms submitted. Application forms, supporting documents and fees are to be forwarded to:

Ontario Environmental Training Consortium (OETC)
37 George Street North, Suite 206
Brampton, Ontario
L6X 1R5

Facility Classification Application Form (Appendix 1)

If you are applying to have a facility classified or reviewed, complete Appendix 1. Then, complete the classification date sheet (Appendix 1 schedule 1-4), which is applicable to the facility you are classifying.

Operator-In-Training (OIT) Application Form (Appendix 2)

Complete the Operator-In-Training form (Appendix 2), when applying for an OIT exam. Submit the $20.00 examination fee plus proof of Grade 12 or equivalency to the certification office for registration. If you are interested in purchasing an OIT study guide, submit $20.00. Please make note on your cheque or on the application form, that you are purchasing an OIT study guide. The certification office will purolate the study guide to your home address.

Water Treatment / Water Distribution Experience Form (Appendix 3a)

Complete this form to update and verify your eligibility for a licence upgrade in water treatment or water distribution. Your experience must be signed by your present employer. Your present employer cannot sign for any previous work done through a different employer. If an operator works at a variety of facilities please list all of the facilities on a separate piece of paper and attach it to your experience form. **Note, it is an offence under the *"Ontario Water Resources Act"* to provide false information.**

Wastewater Treatment / Wastewater Collection Experience Form (Appendix 3b)

Complete this form to update and verify your eligibility for a licence upgrade in wastewater treatment or wastewater collection. Your experience must be signed by your present employer. Your present employer cannot sign for any previous work done through a different employer. If an operator works at a variety of facilities please list all of the facilities on a separate piece of paper and attach it to your experience form. **Note, it is an offence under the *"Ontario Water Resources Act"* to provide false information.**

Examination Request Form (Appendix 4)

Complete this form when requesting to write level 1-4 examinations. Submit the examination fee ($50.00/exam), the examination request form and appropriate experience form (appendix 3a or 3b) to the certification office. Please note, registration will not be confirmed until payment is received. Your exam request form and fees must be received by the certification office 4 weeks prior to the scheduled exam date.

The certification office will send you an examination confirmation letter. This letter will confirm the following details:

1. **what exam you are writing (i.e. WT2)**
2. **the date and time the exam is scheduled for**
3. **where you are writing the exam (map included)**
4. **what materials you need to bring with you to the exam (personal photo ID and calculator)**
5. **licence eligibility requirements - the office will give you detailed description as to what you need to submit in order to have the licence issued upon passing the examination.**

It is important to keep your confirmation letter. After you write your examination you will receive your marks by mail within four (4) weeks of writing. **The certification office cannot give exam marks over the phone.** Upon successful completion of the exam (pass is 70%), refer to your confirmation letter and then submit the appropriate documentation and fees ($75.00 issuing fee per licence).

GLOSSARY OF TERMS

"additional education/training"	Additional training or education beyond grade 12, which is required to obtain a Class III or Class IV licence.
"category"	Refers to the type of facility, there are four different types of categories. Wastewater treatment (WWT), wastewater collection (WWC), water treatment (WT) and water distribution (WD).
"certificate"	1) "Certificate of Classification" is the document which validates the facility class and category. 2) The document previously issued under the Voluntary Certification Program to operators who had met all of the voluntary program requirements. These certificates are now considered valid licences (see definition of licence).
"CEUs"	Continuing Education Units - One CEU is equal to 10 hours of direct contact training. 45 CEUs equals one (1) year of post secondary education.

"class"	Refers to the level of a facility or level of a licence. There are four classes; Class I, Class II, Class III and Class IV.
"Director"	The Ministry of the Environment (MOE) employee, designated by the Minister, who is responsible for implementation of the Regulation (or parts of the Regulation)
"facility"	A wastewater treatment facility, a wastewater collection facility, a water treatment facility or a water distribution facility.
"grandparenting"	A limited time program which allowed operators to become licensed at the level of their facility, without meeting the education and examination requirements. Operators were still required to meet the experience requirements. There have been two grandparenting events: **Voluntary Grandparenting** : Deadline was October 1, 1990. **Mandatory Grandparenting** : Deadline was February 1, 1994. Operators who were grandparented under this program are required to write an exam at the level of their licence. Operators who do not pass the exam will be issued a licence one class lower when they renew.
"licence"	An official document which confirms that the identified person can legally operate that type of facility within the Province of Ontario.
"operator"	A person who adjusts, inspects or evaluates a process that controls the effectiveness or efficiency of a facility, and includes a person who adjusts or directs the flow, pressure or quality of the water within a water distribution facility or the wastewater within a wastewater collection facility.
"operator-in-charge" (OIC)	An operator who, (a) has responsibility for the overall operation of a facility, or (b) sets operational parameters for a facility or for a process that controls the effectiveness or efficiency of a facility, or (c) directs or supervises operators in a facility.
"operator-in-training" (OIT)	A class of licence which does not require any operating experience to obtain.

"operator in overall responsibility"	An operator who is licensed at or above the class of the facility and has been designated by the owner to be responsible for all operational decisions at the facility for a set period of time.
"owner"	A municipality or person having the authority to construct, maintain, operate, repair, improve or extend water works or sewage works.
"professional engineer"	A professional engineer as defined in the Professional Engineers Act.
"upgrade"	The process where an operator obtains a higher class licence that he/she currently possesses.
"wastewater collection facility"	The part of a sewage works that collects or transmits sewage but does not include the part of the sewage works that treats or disposes of sewage.
"wastewater treatment facility"	The part of a sewage works that treats or disposes of sewage but does not include the part of the sewage works that collects or transmits sewage.
"water distribution facility"	The part of a water works that supplies or distributes water but does not include the part of the water works that collects, produces or treats water.
"water treatment facility"	The part of a water works that collects, produces or treats water but does not include the part of the water works that supplies or distributes water.

APPENDIX 2

EXCERPTS FROM THE ASSOCIATION OF BOARDS OF CERTIFICATION OPERATOR CERTIFICATION PROGRAM STANDARDS, APRIL 1999

With permission from ABC

Complete copies of the Operator Certification Program Standards may be obtained from:

Association of Boards of Certification
208 Fifth Street, Ames, IA 50010-6259 USA
Phone 9515) 232-3623; Fax (515) 232-3778
E-mail abc@abccert.org; Web site www.abccert.org

Appendix 2

Excerpts From The Association Of Boards Of Certification Operator Certification Program Standards, April 1999

Qualifications for Certification

III.A Certification shall be issued to each qualified person upon recommendation of the certification board.

III.B Operators shall be certified as Very Small Water System*, Class I, Class II, Class III, or Class IV, with Class IV being the highest or most advanced, corresponding to each of the utility classifications referred to in *Standard II. Classification of Environmental Control Utilities*.

III.C The certification board or its designee shall evaluate each applicant's qualification for certification.

* (Note: Very Small Water System would not apply to a wastewater treatment plant).

III.D The applicant's qualifications for certification shall be based on satisfying minimum education and experience requirements and passing the appropriate certification examination. The education, experience, and examination requirements are corequisites. An applicant may sit for an examination before he/she satisfies the education and/or experience requirements if he/she is fully certified at the next lower certification class, except for Class I applicants. In-Training certificates do not qualify an applicant as fully certified. The education and experience requirements are listed in Appendix 7.

III.E Evaluation of experience may be based on reports of environmental control agency(ies) or other agencies having appropriate responsibilities for supervising environmental control utilities.

III.F The certification board or its designee shall prepare examinations to be used in determining skill, knowledge, ability, and judgment of the applicants. The exams shall be validated. Examinations shall be taken in order from Class I to IV.

III.G The certification board or its designee shall publish upcoming exam dates, times, and locations and deadlines for application submittal; review applications and notify applicants of the status of their application; administer exams; score answer sheets and report results to examinees; and review exam results and make changes in the questions and the exams as necessary.

III.H On satisfactory fulfillment of the certification requirements, the applicant shall be issued a suitable certificate designating his/her competency.

III.I "Grandfather" certificates of proper classification may be issued without examination to the person or persons verified by the governing body or owner to have been in responsible charge of the environmental control utility on or before a specified date stated in the original authorization of the certification program. A certificate so issued shall be valid only in that environmental control utility.

III.J Certificates in an appropriate classification may be issued to holders of valid certificates of competency attained by examination under the previous certification program as specified in the authorization of the new certification program.

III.K The certificate shall state the certified operator's name, the certification class, the date of renewal, and the official certificate number.

III.L An applicant may sit for an examination that is one class higher than the class he/she satisfies the education and experience certification requirements for provided he/she is fully certified at the next lower certification class, except for Class I applicants**.** This individual shall be issued an In-Training certificate provided he/she has passed the appropriate exam. In-Training certificates shall be upgraded to full certificates upon satisfactory fulfillment of all certification requirements during the effective period of the certificate.

III.M A certified operator who desires to become certified in a higher class or a different category must satisfactorily complete the requirements of the higher class or different category before a new certificate shall be issued, except those individuals seeking an In-Training certificate.

III.N Certificates shall be issued for a two-year period.

III.O Certificates shall be valid only so long as the holder uses reasonable care, judgment, and application of his/her knowledge in the performance of his/her duties.

III.P No certificate shall be valid if obtained or renewed through fraud, deceit, or the submission of inaccurate qualification data.

III.Q The certificate of a certified operator who terminates his/her employment in the environmental control utility field shall be remain valid until the certificate expires. After this period, the certificate shall automatically be invalidated. Certified operators whose certificates are invalidated may be issued new certificates of like classification provided appropriate proof of competency is presented to the certification program. Successful completion of an examination may be required at the discretion of the certification program.

Points Classification System

Environmental control treatment plants (not including very small water systems as defined in Appendix 2) shall be classified according to the following point system, using the Plant Point Rating Systems:

Class I	30 points or less
Class II	31 to 55 points
Class III	56 to 75 points
Class IV	76 points or greater

Note: For all point rating systems, each unit process should have points assigned only once, e.g. for a plant using oxidation, precipitation, and filtration for iron removal, add 10 points for the iron removal only and 0 points for filtration.

Very Small Water System

Very Small Water System means a community public water system* that serves 500 persons or less or a non-community public water system** and has no treatment other than disinfection or has only treatment which does not require any chemical treatment, process adjustment, backwashing or media regeneration by an operator (e.g. calcium carbonate filters, granular activated carbon filters, cartridge filters, ion exchangers).

Definitions from the Safe Drinking Water Act:

Public Water System - The term "public water system" means a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves at least twenty-five individuals.

* Community Water System - The term "community water system" means a public water system that

A. serves at least 15 service connections used by year-round residents of the area served by the system; or

B. regularly serves at least 25 year-round residents.

** Non-community Water System - The term "non-community water system" means a public water system that is not a community water system.

Water Treatment Plant Point Rating System

A water system with a groundwater supply and only chlorination is considered a distribution system, not a water treatment facility. A water system with the addition of any chemical to a public water supply other than a disinfectant, shall be considered a treatment facility and should use this rating worksheet to determine the classification of the facility, using the Points Classification System in Appendix 1. Each unit process should have points assigned only once.

Item	Points
Size (2 point minimum to 20 point maximum)	
Maximum population or part served, peak day (1 point minimum to 10 point maximum)	1 pt per 10,000 or part
Design flow average day or peak month's flow average day, whichever is larger (1 point minimum to 10 point maximum)	1 pt per MGD or part
Water supply sources	
Groundwater	3
Groundwater under the influence of surface water	5
Surface water	5
Average raw water quality varies enough to require treatment changes 10% of the time – range of 0 to 10 points with the following guidelines: Little or no variation = 0 points High variation (Raw water quality subject to periodic serious industrial waste pollution) = 10 points	0—10
Raw water quality is subject to or has elevated:	
• Taste and/or odor levels	3
• Color levels	3
• Iron and/or manganese levels	5
• Turbidity levels	5
• Coliform and/or fecal counts	5
• Algal growths	5
Raw water quality is subject to periodic:	
• Industrial and commercial waste pollution	5
• Agricultural pollution	5
• Urban runoff, erosion, and storm water pollution	3
• Recreational use (boating, fishing, etc.)	2
• Urban development and residential land use pollution	2
Chemical Treatment/Addition Process	
Fluoridation	5

Disinfection	
• Gaseous chlorine	5
• Liquid or powdered chlorine	5

• Chlorine dioxide	5
• Ozonization (on-site generation)	10
pH adjustment (Calcium carbonate, carbon dioxide, hydrochloric acid, calcium oxide, calcium hydroxide, sodium hydroxide, sulfuric acid, other)	5
Stability or Corrosion Control (Calcium oxide, calcium hydroxide, sodium carbonate, sodium hexametaphosphate, other)	10
Coagulation & Flocculation Process	
Chemical addition (1 point for each type of chemical coagulant added, maximum 5 points) (Aluminum sulfate, bauxite, ferrous sulfate, ferric sulfate, calcium oxide, bentonite, calcium carbonate, carbon dioxide, sodium silicate, other)	0—5
Rapid mix units	
• Mechanical mixers	3
• Injection mixers	2
• In-line blender mixers	2
Flocculation tanks	
• Hydraulic flocculators	2
• Mechanical flocculators	3
Clarification/Sedimentation Process	
Horizontal-flow (rectangular basins)	5
Horizontal-flow (round basins)	7
Up-flow solid-contact sedimentation	15
Inclined-plate sedimentation	10
Tube sedimentation	10
Dissolved air flotation	30
Filtration Process	
Single media filtration	3
Dual or mixed media filtration	5
Microscreens	5
Diatomaceous earth filters	5
Cartridge filters	5
Slow sand filters	5
Direct filtration	5
Pressure or greensand filtration	20

Other Treatment Processes	
Aeration	3
Packed tower aeration	5
Ion-exchange/softening	5

Lime-soda ash softening	20
Copper sulfate treatment	5
Powdered activated carbon	5
Special Processes (reverse osmosis, electrodialysis, other)	15
Residuals Disposal	
Discharge to lagoons	5
Discharge to lagoons and then raw water source	8
Discharge to raw water	10
Disposal to sanitary sewer	3
Mechanical dewatering	5
On-site disposal	5
Land application	5
Solids composting	5
Facility Characteristics	
Instrumentation (0 point minimum to 6 point maximum)	
• The use of SCADA or similar instrumentation systems to provide data with no process operation	0
• The use of SCADA or similar instrumentation systems to provide data with limited process operation	2
• The use of SCADA or similar instrumentation systems to provide data with moderate process operation	4
• The use of SCADA or similar instrumentation systems to provide data with extensive or total process operation	6
Clearwell size less than average day design flow	5

Water Treatment Definitions

Aeration

The process of adding air to water. Air can be added to water by passing air through water or passing water through air.

Diatomaceous earth filters

Filter technology using a thin layer of diatomaceous earth (a fine, siliceous material) that is deposited on a porous plate to serve as a filter. Mainly used in smaller systems because of its relative simplicity of units and maintenance requirements.

Direct filtration

Filtration process where the sedimentation stage of conventional filtration is omitted. Filtration is performed directly after the flocculation stage of treatment. Filter aid is usually added before filtration.

Dissolved air flotation

Process of solids removal where dissolved air is added to the clarifier from the bottom of the basin and the air raises suspended particles to the top of the water where the particles are removed by skimming.

Electrodialysis

Process where brackish water flows between alternating cation-permeable and anion-permeable membranes. A direct electronic current provides the motive force to cause ions to migrate through the membranes and either react to create a gas or remain in a separate solution as brine wastewater.

Horizontal-flow

Flow of water in a horizontal direction through a rectangular or round sedimentation/clarification basin as opposed to a vertical or upward flow that would be found in a solids-contact clarifier.

Injection mixers

Use of perforated tubes or nozzles to disperse the coagulant into the water being treated. Provides uniform distribution of the coagulant over the entire basin. Generally sensitive to flow changes and may require frequent adjustments to produce the proper amount of mixing.

In-line blender mixers

Used for coagulant mixing where coagulant is added directly to water being treated through a diffuser in a pipe. Provides rapid dispersion of the coagulant without significant head loss. Energy consumption is less than a comparable mechanical mixer.

Mechanical dewatering

The use of mechanical devices such as centrifuges and rotational mechanisms to force the separation of solids (sludge) from liquids (water).

Mechanical mixers

Paddles, turbines, and propellers frequently used in coagulation facilities. Use electrical energy for mixing the coagulant with the water being treated.

pH adjustment

The alteration of the pH of the raw water or prefinished water by mechanical or chemical procedures to enhance the performance of the treatment process.

Reverse osmosis

Passage of water from a concentrated solution through a semipermeable membrane to fresh water with the application of pressure.

SCADA instrumentation

The Supervisory Control And Data Acquisition system is a computer-based system that monitors and controls remote water facility sites. A SCADA master control is typically located in a dedicated control center or treatment plant control room. Remote sites are equipped with remote terminal units to gather information and issue controls from the master station.

Solids composting

Mixing of sludge with decaying organic material for eventual use as fertilizer.

Stability or corrosion control

The removal of dissolved gases, treatment of the finished water to make it non-corrosive, and building of protective coating inside the pipe.

Tube sedimentation

Tube settlers or high rate settlers are placed in rectangular or circular basins. Water enters the inclined settler tubes and is directed upward through the tubes. Each tube functions as a shallow settling basin. Particles collect on the inside surfaces of the tubes or settle to the bottom of the basin.

Up-flow solid-contact sedimentation

Unit which combines the coagulation, flocculation, and sedimentation processes into a single basin, which is either rectangular or circular in shape. Flow is an upward direction through a sludge blanket or slurry of flocculated, suspended solids.

Urban runoff

During dry periods, oil, grease, gasoline, and other residues accumulate on paved surfaces. When storms begin, this material is washed into local receiving water from roadway storm drainage systems. Urban runoff also contains animal droppings from pets and fertilizers used for landscaping. Contributes to taste and odor complaints.

Wastewater Treatment Plant Point Rating System (Non-Industrial/Municipal)

A wastewater system with only collection, lift stations, and chlorination is considered a collection system and not a wastewater treatment facility. A wastewater treatment facility should use this rating worksheet to determine the classification of the facility, using the Points Classification System in Appendix 1. Each unit process should have points assigned only once.

Item	Points
Size (2 point minimum to 20 point maximum)	
Maximum population equivalent (PE) or part served, peak day (1 point minimum to 10 point maximum)	1 pt per 10,000 or part
Design flow average day or peak month's part flow average day, whichever is larger (1 point minimum to 10 point maximum)	1 pt per MGD or part
Variation in raw waste (0 point minimum to 6 point maximum)[1]	
Variations do not exceed those normally or typically expected	0
Recurring deviations or excessive variations of 100 to 200% in strength and/or flow	2
Recurring deviations or excessive variations of more than 200% in strength and/or flow	4
Raw wastes subject to toxic waste discharges	6
Impact of septage or truck-hauled waste (0 point minimum to 4 point maximum)	0—4
Preliminary treatment	
Plant pumping of main flow	3
Screening, commination	3
Grit removal	3
Equalization	1
Primary Treatment	
Clarifiers	5
Imhoff tanks or similar	5
Secondary Treatment	
Fixed-film reactor	10
Activated sludge	15
Stabilization ponds without aeration	5
Stabilization ponds with aeration	8
Tertiary Treatment	
Polishing ponds for advanced waste treatment	2
Chemical/physical advanced waste treatment w/o secondary	15

Chemical/physical advanced waste treatment following secondary	10
Biological or chemical/biological advanced waste treatment	12
Nitrification by designed extended aeration only	2
Ion exchange for advanced waste treatment	10
Reverse osmosis, electrodialysis and other membrane filtration techniques	15

Advanced waste treatment chemical recovery, carbon regeneration	4
Media filtration	5
Additional Treatment Processes	
Chemical additions (2 points each for a maximum of 6 points)	0—6
Dissolved air flotation (for other than sludge thickening)	8
Intermittent sand filter	2
Recirculating intermittent sand filter	3
Microscreens	5
Generation of oxygen	5
Solids Handling	
Solids stabilization	5
Gravity thickening	2
Mechanical dewatering	8
Anaerobic digestion of solids	10
Utilization of digester gas for heating or cogeneration	5
Aerobic digestion of solids	6
Evaporative sludge drying	2
Solids reduction (including incineration, wet oxidation)	12
On-site landfill for solids	2
Solids composting	10
Land application of biosolids by contractor	2
Land application of biosolids under direction of facility operator in direct responsible charge	10
Disinfection (0 point minimum to 10 point maximum)	
Chlorination or ultraviolet irradiation	5
Ozonation	10
Effluent discharge (0 point minimum to 10 point maximum)	
Mechanical post aeration	2
Direct recycle and reuse	6
Land treatment and disposal (surface or subsurface)	4
Instrumentation (0 point minimum to 6 point maximum)	
The use of SCADA or similar instrumentation systems to provide data with no process operation	0
The use of SCADA or similar instrumentation systems to provide data with limited process operation	2
The use of SCADA or similar instrumentation systems to provide data with moderate process operation	4

The use of SCADA or similar instrumentation systems to provide data with extensive or total process operation	6
Laboratory control (0 point minimum to 15 point maximum)[2]	
Bacteriological/biological (0 point minimum to 5 point maximum)	
• Lab work done outside the plant	0

• Membrane filter procedures	3
• Use of fermentation tubes or any dilution method; fecal coliform determination	5
Chemical/physical (0 point minimum to 10 point maximum)	
• Lab work done outside the plant	0
• Push-button or visual methods for simple tests such as pH, settleable solids	3
• Additional procedures such as DO, COD, BOD, gas analysis, titrations, solids, volatile content	5
• More advanced determinations such as specific constituents; nutrients, total oils, phenols	7
• Highly sophisticated instrumentation such as atomic absorption, gas	10

1 The key concept is frequency and/or intensity of deviation or excessive variation from normal or typical fluctuations; such deviation can be in terms of strength, toxicity, shock loads, I/I, with points from 0 to 6.

2 The key concept is to credit laboratory analyses done on-site by plant personnel under the direction of the operator in direct responsible charge with points from 0 to 15.

Wastewater Treatment Definitions

Activated sludge

Wastewater treatment by aeration of suspended organisms followed by clarification, including extended aeration, Intermittent Cycle Extended Aeration System (ICEAS), and other similar processes. A sequencing batch reactor with the purpose of providing this form of treatment would be rated under this category.

Biological or chemical/biological advanced waste treatment

The advanced treatment of wastewater for nutrient removal including nitrification, denitrification, or phosphorous removal utilizing biological or chemical processes or a combination. If the facility is designed to nitrify based solely on detention time in an extended aeration system, only the points for nitrification by designed extended aeration should be given.

Chemical addition

The addition of a chemical to wastewater at an application point for the purposes of adjusting pH or alkalinity, improving solids removal, dechlorinating, removing odors, providing nutrients, or otherwise enhancing treatment, excluding chlorination for disinfection of effluent and the addition of enzymes or any process included in the Tertiary Chemical/Physical Processes. The capability to add a chemical at different application points for the same purpose should be rated as one application; the capability to add a chemical(s) to dual units should be rated as one application; and the capability to add a chemical at different application points for different purposes should be rated as separate applications.

Chemical/physical advanced treatment following secondary

The use of chemical or physical advanced treatment processes following (or in conjunction with) a secondary treatment process. This would include processes such as carbon adsorption, air stripping, chemical coagulation, and precipitation, etc.

Chemical/physical advanced treatment without secondary

The use of chemical or physical advanced treatment processes without the use of a secondary treatment process. This would include processes such as carbon adsorption, air stripping, chemical coagulation, precipitation, etc.

Fixed-film reactor

Biofiltration by trickling filters or rotating biological contactors followed by secondary clarification.

Imhoff tanks (or similar)

Imhoff tanks, septic tanks, spirogester, clarigester, or other single unit for combined sedimentation and digestion.

Land application of biosolids by contractor

The land application or beneficial reuse of biosolids by a contractor outside of the control of the operator in direct responsible charge of the wastewater treatment facility.

Land treatment and disposal (surface or subsurface)

The ultimate treatment and disposal of the effluent onto the surface of the ground by rapid infiltration or rotary distributor or by spray irrigation. Subsurface treatment and disposal would be accomplished by infiltration gallery, injection, or gravity or pressurized drain field.

Mechanical dewatering

The removal of water from sludge by any of the following processes and including the addition of polymers in any of the following: vacuum filtration; frame, belt, or plate filter presses; centrifuge; or dissolved air flotation.

Mechanical post-aeration

The introduction of air into the effluent by mechanical means such as diffused or mechanical aeration. Cascade aeration would not be assigned points.

Media filtration

The advanced treatment of wastewater for removal of solids by sand or other media or mixed media filtration.

Operator in Direct Responsible Charge

Direct Responsible Charge (DRC) is accountability for and performance of active daily, on-site operation of a plant/system.

Solids composting

The biological decomposition process producing carbon dioxide, water, and heat. Typical methods are windrow, forced air-static pile, and mechanical.

Solids stabilization

The processes to oxidize or reduce the organic matter in the sludge to a more stable form. These processes reduce pathogens or reduce the volatile organic chemicals and thereby reduce the potential for odor. These processes would include lime (or similar) treatment and thermal conditioning. Other stabilization processes such as aerobic or anaerobic digestion and composting are listed individually.

Distribution and Collection System Point Ratings

Distribution System Point Rating System

Distribution systems shall be rated according to the population served as follows:

1,500 and less	Class I
1,501 to 15,000	Class II
15,001 to 50,000	Class III
50,001 and greater	Class IV

"In-line" treatment (such as booster pumping, chlorination, or stabilization) is considered an integral part of the distribution system.

Operator Education and Experience Requirements

The education and experience requirements for operators are:

Very Small Water System

- Six contact hours of very small water system education; and
- Six months of acceptable operating experience of a very small water system or higher utility.
- No substitution for experience shall be permitted.
- No substitution for education shall be permitted.

Class I

- High school diploma, GED, or equivalent; and
- One year of acceptable operating experience of a Class I or higher utility.
- No substitution for experience shall be permitted.

Class II

- High school diploma, GED, or equivalent; and
- Three years of acceptable operating experience of a Class I or higher utility.
- A maximum of 675 contact hours, or sixty-eight CEUs, or sixty-eight quarter credits, or forty-five semester credits of post high school education in the environmental control field, engineering or related science may be substituted for one and one-half years of operating experience.

Class III

- High school diploma, GED, or equivalent; and
- 900 contact hours, or ninety CEUs, or ninety quarter credits, or sixty semester credits of post high school education in the environmental control field, engineering or related science; and
- Four years of acceptable operating experience of a Class II or higher utility, including two years of direct responsible charge.

- A maximum of 900 contact hours, or ninety CEUs, or ninety quarter credits, or sixty semester credits of appropriate post high school education in the environmental control field, engineering or related science may be substituted for two years of experience; however, the applicant must still have one year of direct responsible charge experience.
- A maximum of one year of direct responsible charge experience in a Class II or higher position may be substituted for 450 contact hours, or forty-five CEUs, or forty-five quarter credits, or thirty semester credits of post high school education in the environmental control field, engineering or related science.

Class IV

- High school diploma, GED, or equivalent; and
- 1,800 contact hours, or 180 CEUs, or 180 quarter credits, or 120 semester credits of post high school education in the environmental control field, engineering or related science; and
- Four years of acceptable operating experience of a Class III or higher utility, including two years of direct responsible charge.
- A maximum of 900 contact hours, or ninety CEUs, or ninety quarter credits, or sixty semester credits of appropriate post high school education in the environmental control field, engineering or related science may be substituted for two years of experience; however, the applicant must still have one year of direct responsible charge experience.
- A maximum of two years of direct responsible charge experience in a Class III or higher position may be substituted for 900 contact hours, or ninety CEUs, or ninety quarter credits, or sixty semester credits of post high school education in the environmental control field, engineering or related science.

Substitutions

- Education applied to operating and direct responsible charge experience requirement shall not also be applied to education requirement.
- Operating or direct responsible charge experience applied to the education requirement shall not also be applied to the operating or direct responsible charge experience requirement.
- One year of operating or direct responsible charge experience may be substituted for two years of grade school education, without limit.
- One year of operating or direct responsible charge experience may be substituted for one year of high school, without limit.
- Where applicable, related experience in maintenance, laboratories, other environmental control utility positions and allied trades such as plumbing, or other certification categories, may be substituted for one-half of the operating or direct responsible charge experience requirement; however, the applicant for Class III and IV must still have one year of direct responsible charge experience.
- The maximum substitution of education and related experience for operating or direct responsible charge experience shall not exceed fifty percent of the stated operating or direct responsible charge experience requirement.

APPENDIX 3

AGREEMENT ON RECIPROCAL CERTIFICATION FOR WATER AND WASTEWATER OPERATORS

Appendix 3

Agreement On Reciprocal Certification For Water And Wastewater Operators

WHEREAS

It is desirable that there be reciprocity of certification in order to facilitate the movement of certified operators in Canada, the certifying agencies agree as follows:

DEFINITIONS

Member: Any provincial, or other certifying agency that issues operator certificates of qualifications in general accordance with the ABC guidelines.

Affiliate Member: Any agency whose activities are directed toward the development and recognition of qualifications of water and wastewater operators, that agrees with the basic principles of the Agreement, accepts the certificates issued by Members of this agreement, has indicated to the Secretary their desire to be an Affiliate Member and has been accepted by a vote of the Members.

Agreement Administrative Committee: Each Member and Affiliate Member of this agreement may nominate one delegate to attend any meeting of the members and to serve as the member's representative on the collective group of members' delegates, the Agreement Administration Committee (AAC). The AAAC shall elect from its members a Chairman, Vice-Chairman, and Secretary who will function as the Executive Committee. Members of the AAC must possess a demonstrated commitment to the certification process but need not be a member of a Member's certifying agency or Affiliate Member's executive or management.

Valid Operator Certificate: a certificate issued to an operator by the appropriate authority clearly indicating the level of certification of the operator, whether or not the certification has any form of restriction or special circumstances, and the period of time during which the certificate is in effect.

Conditional Certificate: a clearly identified certificate issued to an operator by the appropriate authority under circumstances that do not meet the normal requirements of experience, responsibility, education, and examination as described below in the guidelines.

Types of conditional certificate include but are not limited to:

- certificates issued based on experience but not examination and/or education;
- certificates issued based on examination and education but not experience;
- certificates issued based on verbal examination.

GUIDELINES

1. All Members of this agreement hereby agree to adopt the basic principles of the Association of Boards of Certification (ABC) guidelines as published in the ABC booklet entitled "Operator Certification Program Standards".

2. Each Member reserves the right to impose specific requirements for the issuance of their certificates within the general guidelines of the ABC. Each will develop an appropriate Certification by Reciprocity application form to suit their specific needs.

3. All Members will submit the details of their programs, including any conditional certificates issued, to the Secretary of the Executive Committee.

4. Any proposed change to a member's program and/or the ABC guidelines shall be submitted to the Secretary of the Executive Committee for distribution to the Members.

5. Amendments to this Agreement and/or the inclusion of new members to the Agreement shall be approved by a simple majority of the Members of the Agreement.

6. This Agreement shall be reviewed by each Member not longer than five years after signing it and they will forward any comments and/or suggested revisions to the Secretary.

GENERAL

1. Where an operator holds a valid certificate by examination from a Member, he/she shall normally be entitled to an equivalent certificate from any other Member of this agreement upon submission of a Certification by Reciprocity application and payment of the appropriate fees to the Member from which he/she is requesting the certificate.

2. Where an operator holds a valid certificate, restricted by virtue of not having written an examination and is applying for a similar conditional certificate from another Member, he/she shall normally entitled to an equivalent certificate upon submission of a Certification by Reciprocity application and payment of the appropriate fees to the Member from which he/she is requesting the certificate.

3. Where an operator holds a valid certificate, restricted by virtue of not having written an examination and is applying for an unrestricted certificate from a Member, the operator will be required to submit a Certification by Reciprocity application and, at a minimum, pass the appropriate examination at the level of his/her existing certificate, and pay the appropriate fees.

4. Where an operator holds a grandparent certificate or a certificate restricted by virtue of not having the normally required experience from any Member, he/she shall not be granted any other certificate by any other Member without complying with all normal provisions of experience, responsibility, education, and examination.

5. An operator may hold valid certificates in more than one Member's program upon payment of the appropriate fees to each Member and meeting appropriate requirements.

6. Until such time as the Members shall decide to change, the Secretariat of the Executive Committee shall be the CWWA through their office in Ottawa.

CURRENT STATUS

MEMBERS: the following agencies have been accepted into this agreement as Members, as of the date of this new Agreement.

Alberta: Alberta Environmental Protection, Municipal Water and Wastewater Branch
British Columbia: Environmental Operators Certification Program
Manitoba: Manitoba Water and Wastewater Association
New Brunswick: Atlantic Canada Water and Wastewater Voluntary Certification Program
Newfoundland/Labrador: Atlantic Canada Water and Wastewater Voluntary Certification Program
Northern Territories: Northern Territories Water and Waste Association
Nova Scotia: Nova Scotia Water and Wastewater Certification Program
Ontario: Ontario Ministry of the Environment
Prince Edward Island: Atlantic Canada Water and Wastewater Voluntary Certification Program
Saskatchewan: Saskatchewan Environment and Resource Management

AFFILIATE MEMBERS: the following have been accepted into this agreement as Affiliate Members, as of the date of this new Agreement

Canadian Water and Wastewater Association
Environment Canada
Health Canada
First Nations Water & Wastewater Advisory Committee
Réseau Environnement

SECRETARIAT: at the time of signing of this Agreement, the Secretariat for the Agreement is the Canadian Water and Wastewater Association (CWWA), with its Executive Director acting as Secretary of the Agreement Administrative Committee.

PARTICIPATING MEMBERS

This “Agreement on Reciprocal Certification for Water and Wastewater Operators” dated February 22, 1998 is hereby accepted by the members designated herein and replaces the previous reciprocity agreement (1977) and subsequent amendments to it.

APPENDIX 4

EDUCATION / TRAINING REQUIREMENTS FOR CERTIFICATION 2001

Appendix 4

North American Education/Training Requirements For Certification – 2001

State Province/ Territory	Small Systems Certification yes/no	Specific Training Required yes/no	Other Certification Specific Training Required	HSD+ Required	Continuing Education Required for Renewal
AB	Yes	Yes	No	Yes	No
AK	Yes	Yes	Yes	Yes	Yes
AR	Yes	HSD	No	Yes	Yes
BC	Yes	Yes	No	Yes	No
CA	Yes	No	Yes	Yes	Yes
CO	Yes	No	No	Yes	Yes
CT	Yes	Yes	No	Yes	Yes
DE	Yes	No	No	Yes	Yes
IA	Yes	No	No	Yes	Yes
IL	Yes	No	No	Yes	Yes
KS	Yes	HSD	No	Yes	Yes
KY	Yes	No	No	?	Yes
MA	Yes	No	No	Yes	Yes
MB	Yes	No	No	No	No
MD	No	N/A	No	Yes	Yes
MN	Yes	No	No	Yes	Yes
MO	No	No	No	No	Yes
MS	Yes	Yes	Yes	Yes	Yes
MT	Yes	No	No	Yes	Yes
NB	No	N/A	No	No	No
NC	Yes	Yes	Yes	No	Yes
NE	Yes	Yes	Yes	Yes	Yes
NF	No	N/A	No	No	No
NH	Yes	No	No	Yes	Yes
NJ	Yes	Yes	Yes	Yes	Yes

State Province/ Territory	Small Systems Certification yes/no	Specific Training Required yes/no	Other Certification Specific Training Required	HSD+ Required	Continuing Education Required for Renewal
NS	No	N/A	No	No	No
NT	Yes	Yes	No	Yes	Yes
OH	Yes	No	No	Yes	Yes
ON	Yes	Yes	No	Yes	Yes
OR	Yes*	Yes	No	Yes	Yes
PA	Yes	Yes*	Yes*	?*	Yes
PE	No	N/A	No	No	No
RI	Yes	No	No	Yes	Yes
SD	Yes	No	No	Yes	Yes
SK	Yes	No	No	No	No
TN	Yes	HSD	No	Yes	Yes
TX	No	N/A	Yes	Yes	Yes
UT	Yes	No	No	No	Yes
VT	Yes	HSD	No	Yes	Yes
WA	Yes	No	No	Yes	Yes
WI	Yes	Yes*	No	No	Yes
WY	Yes	Yes	Yes	Yes	Yes

+ HSD – High School Diploma
* with some exceptions

APPENDIX 5

AMERICAN WATER WORKS ASSOCIATION STATEMENTS OF POLICY

Appendix 5

American Water Works Association Statements of Policy

Operator Certification

Adopted by the Board of Directors Jan. 30, 1977, and revised Jan. 31, 1982, June 14, 1987, and Jan. 26, 1992

The American Water Works Association (AWWA) fully supports mandatory certification of the persons in responsible charge of water treatment and distribution facilities. Further, all operators of water treatment and distribution facilities should be encouraged to gain certification. AWWA believes the model certification program and training coordination procedures such as those developed by the Association of Boards of Certification (ABC) should be followed to ensure the efficient use of state, provincial, and local resources.

Mandatory and voluntary certification has been in existence both in the United States and Canada for more than 45 years. Experience has demonstrated that mandatory certification is a more effective measure for assuring continued operational proficiency of water supply facilities, as well as involving operators in the educational process.

Thoroughly trained and qualified operators are essential for the protection of public health and the maintenance of safe and reliable operations of water treatment and distribution facilities. Mandatory certification ensures qualified operators.

ABC, in cooperation with state and provincial personnel, has developed guidelines to minimize the cost of program development and provide for a comprehensive approach to training and certification to meet the needs of the water utility profession. Because the membership of AWWA is well represented on ABC committees, AWWA believes that its operator certification interests can best be achieved by actively promoting the establishment and implementation of ABC programs.

AWWA supports ABC's program for uniform reciprocity, which will benefit both operators and the water utility profession.

Rapidly changing laws and regulations regarding public water systems necessitate continuing education as a requirement for certification renewal to maintain the competence of qualified operators. The new regulations and higher standards present an increased need for operators of public systems to have a working knowledge of hydraulics, chemistry, laboratory procedures, theory of risk assessment and management, and operation and maintenance, as well as public communications.

AWWA firmly believes that mandatory continuing education measured by recognized continuing education units (CEUs) is essential to the development and sustained competence of all operators. Therefore, the accumulation of CEUs should be a requirement of certification renewal.

Employee Training and Career Development

Adopted by the Board of Directors Jan. 30, 1977, revised June 22, 1986, reaffirmed Jan. 27, 1991, and revised Feb. 2, 1997

The American Water Works Association (AWWA) strongly encourages each water system to adopt personnel policies endorsing competence-based training and career development opportunities through attendance at educational, technical and scientific conferences, and other continuing education programs. AWWA further recommends that each water system adopt personnel development provisions that authorize adequate time and funding for the training of personnel at all levels of the system's operations.

The water utility profession is undergoing dramatic changes in resource management issues, water treatment and distribution technologies, scientific findings that affect water quality standards, and the replacement and expansion of facilities needed to provide dependable water service and meet increased service demands. Because of the responsibility that water systems have for the public health and safety of their customers, it is increasingly essential that all employees of water systems acquire the specialized knowledge and skills needed for the competent and efficient operation of their systems and its facilities. The association recommends that water systems determine the level of specialized knowledge and skills required through benchmarking and the setting of performance standards.

The retention of qualified managers, water supply professionals, and water system personnel can be enhanced through career development programs that encourage participation in a variety of continuing education programs and on-the-job training. The costs associated with underwriting training and educational experiences as an employee benefit are minimal compared with the capital invested in system facilities and the savings that result from improving the qualifications and job performance of system personnel.

The Association further subscribes to the principle that training, education, and career development programs be based on equal opportunity for all water system employees without regard to race, color, religion, sex, national origin, age, or disability.

APPENDIX 6

EXCERPTS FROM THE RECORDS OF THE FACE CHARLOTTETOWN MEETING

Appendix 6 **Excerpts From the Records of the FACE Charlottetown Meeting**

TABLE VII. – Personnel Classification System – Formal Education and Experience Requirements in Years

Type Facility/System	Operator Class											
	Operator in Training		I		II		III			IV		
	Edu-cation	Operating Exper-ience	Edu-cation	Operating Exper-ience	Edu-cation	Operating Exper-ience	Edu-cation	Operating Experi-ence	DCR Experi-ence	Edu-cation	Operating Experi-ence	DCR Experi-ence
Wastewater Collection (WWC)	12	(a)	12	1	12	3	14	4		16	4	
Wastewater Treatment (WWT)	12	(a)	12	1	12	3	14	4	(b)(2)	16	4	(b)(2)
Water Distribution (WD)	12	(a)	12	1	12	3	14	4		16	4	
Water Treatment (WT)	12	(a)	12	1	12	3	14	4	(b)(2)	16	4	(b)(2)

(a) Three (3) months operating experience or completion of an approved basic training course.
(b) Class III and IV WWT and WT require one half of the minimum experience requirement to be “direct responsible charge” experience (DRC).
(c) See Table VIII for substitution and equivalencies.
(d) Operator training may be used in lieu of formal academic training if assigned to CEU value.

TABLE VIII – Operator Qualifications: Experience, Education and Substitutions

EXPERIENCE REQUIREMENTS

DEFINITIONS

- Operating experience is defined as time spent at a plant or system in satisfactory performance of operation duties.
- Direct responsible charge (DRC) is defined as:

(1) In smaller facilities where shift operation is not required, DRC experience is
   (a) Active, daily, on-site charge and performance of operation duties in the next lower certification class.

(2) In larger facilities where shift operation is required, DRC experience is defined as both:
   (a) Active, daily, on-site technical direction and supervision of operation duties in the next lower certification class, and/or:
   (b) Active, daily, on-site charge of an operating shift, or a major segment of a system or facility, in the same or next lower certification class.

DRC Requirement

- For Class I or Class II certification, DRC experience is not required.
- For Class III certification, one-half of the operating experience requirement must be DRC experience gained
  (a) in Class II, if in a top supervisory position, and as specified in the definition of DRC experience, or
  (b) in Class II or higher, if on-site charge, and as specified in the definition of DRC experience.
- For Class IV certification, one-half of the operating experience requirement must be DRC experience gained
  (a) in Class III, if in a top supervisory position, and as specified in the definition of DRC experience, or
  (b) in Class III or higher, if on-site charge, and as specified in the definition of DRC experience.

SUBSTITUTIONS FOR EXPERIENCE REQUIREMENTS

No substitution for experience requirement for Class I is permitted.

Substitutions may be made for required experience for Classes II, III, and IV, but with the limitation that 50 percent of any stated experience requirement (both Operating and DRC) must be met by actual on-site operating experience in a plant or system.

FORMAL EDUCATION

- High school education cannot be credited for substitutional value toward any experience requirement; high school education is in itself a basic requirement for certification at any level.
- Approved relevant formal academic education at the post-high school or college level may be substituted for experience requirement (either Operating or DRC) on a year-for-year basis, subject to the 50 percent limitation previously described. Thirty (30) semester or 45 quarter hours are considered the equivalent of one (1) year of formal education.
- Education applied in substitution for an experience requirement cannot also be applied to the education requirement.

OPERATOR TRAINING

- Specialized operator training courses, seminars, workshops, approved technical conferences, etc., may be substituted for experience requirement (either Operating or DRC) subject to the 50 percent limitation previously described. Calculation will be based on Continuing Education Units (CEUs) with 45 considered equal to 1 year.

OTHER EXPERIENCE

- Partial credit toward operating experience (both Operating and DRC) may be given for experience in plant or system maintenance, in the laboratory, in a different utility division or certification category than that which is being applied for, or in related (allied) trades such as plumbing, as determined or approved by the board.

FORMAL EDUCATION REQUIREMENTS

DEFINITIONS

- A High School diploma (12 years) is prescribed as a desirable minimum formal education level for any class of certification.
- Applicants without a high school diploma are strongly encouraged to pass a (GED) General Education Development test or its equivalent.
- The formal education requirement of fourteen (14) years for Class III includes two (2) years of approved related or relevant college-level formal education in the environmental field, or specialized training, (90 CEUs) or a combination of formal education and training.
- The formal education requirement of sixteen (16) years for Class IV includes four (4) years of approved related or relevant college-level formal education in the environmental field, or specialized training, (180 CEUs) or a combination of formal education and training.

- Related or relevant college-level formal education includes two-year courses or curricula in environmental technology; and four-year B.S. degree programs in environmental engineering, sciences, and similar programs as approved by the board. Specialized training includes courses, seminars, etc., which have been approved by the board and evaluated in terms of CEUs.
- Applicants lacking in formal education can take advantage of specialized operator training courses. These can be substituted for formal education without limit. This assures that an operator who has not had the opportunity to go to college still has the opportunity to advance to the highest certification class.

SUBSTITUTIONS FOR FORMAL EDUCATION REQUIREMENTS

Substitutions may be made for required formal education, subject to the following criteria.

Experience

- A year of operating experience (Operating or DRC) may be substituted for two (2) years of grade school, without limitation.
- A year of operating experience (Operating or DRC) may be substituted for one (1) year of high school, without limitation.
- A maximum of one (1) year of DRC experience in a Class II (or higher) position may be substituted for one (1) year of college-level formal education requirement for Class III certification.
- A maximum of one (1) year of DRC experience in a Class III (or higher) position may be substituted for one (1) year of college-level formal education requirement for Class IV certification.
- Experience applied in substitution for an education requirement cannot also be applied to the experience requirement.

Operator Training

- Specialized operator training courses, seminars, workshops, technical conferences, etc., as approved by the board, may be substituted for formal education without limitation. Calculation will be based on CEUs.

CONTINUING EDUCATION UNIT (CEU)

- The CEU is defined by the National University Extension Association (NUEA) as "ten contact hours of participation in an organized continuing education experience under
  - responsible sponsorship,
  - capable direction, and
  - qualified instruction."

Examples

- Ten classroom or contact hours in an approved course = 1 CEU.
- A one-day seminar offering 6 net contact hours (not including coffee breaks or lunch) could be rated or credited as 0.6 CEU.
- A basic training course of 36 net contact hours could be rated or credited as 3.6 CEU.

- The CEU value of each training course, seminar, workshop, etc., should be determined by the sponsoring/administering agency, with the advice and concurrence of the board, before the course begins.
- After consultation with authorities, it has been established 45 CEUs are comparable or parallel (not equal) to one year of college-level formal education for substitutional purposes.

Other Education

- Partial credit toward formal education requirements may be given for academic work or vocational training in allied fields, as determined by the board.

TABLE IX – Education-Experience Equivalencies

WHEN SHORT OF EXPERIENCE -

This Education or Training	May Be Substituted For	Limit
High school education	No credit	-
Relevant college-level education, 1 year	1 year operating or DRC experience	Half of experience requirement
Relevant and specialized operator training as approved, expressed as CEU	1 year operating or DRC experience	Half of experience requirement

NOTE: For Class II, III, and IV certification, substitutions may be made for required experience, but with the limitation that 50 percent of all stated experience requirements (both operating and DRC) must be met by actual on-site operating experience in the appropriate type of plant or system.

WHEN SHORT OF FORMAL EDUCATION -

This Experience or Training	May Be Substituted For	Limit
Operating or DRC experience, 1 year	2 years grade school	None
Operating or DRC experience, 1 year	1 year high school	None
In Class III, DRC (only) experience in Class II or higher, 1 year	1 year college-level education	1 year substitution
In Class IV, DRC (only) experience in Class III or higher, 1 year	1 year college-level education	1 year substitution
Relevant and specialized operator training as approved, expressed as CEU	1 year formal education	None

TABLE X

FACILITY	UNITS	I.	II.	III.	IV.
WWC*	Population Served	1500 and Less	1501-15,000	15,001-50,000	50,001 and Greater
WWT	Range of Points	30 and Less	31-55	56-75	76 and Greater
WD*	Population Served	1500 and Less	1501-15,000	15,001-50,000	50,001 and Greater
WT	Range of Points	30 and Less	31-55	56-75	76 and Greater
*Simple "in-line" treatment such as booster pumping or preventive chlorination or odor control is considered an integral part of a distribution or collection system.					

Classification of Treatment Plants (WT & WWT)

FACILITY-CLASS RANGE OF POINTS	I.	II.	III.	IV.
	30 and Less	31-55	56-75	76 and Greater

Water Treatment Plants

Assign points for every item that applies:

Item	Points	Rating	
1. Size			
Maximum population served, peak day	1 pt. per 10,000 or part	_____	Max. 10 points
Design flow (avg. day) or peak month's production (avg. day), whichever is larger	1 pt. per MGD or part	_____	Max. 10 points
2. Water Supply Source			
Groundwater	3	_____	
Surface water	5	_____	
Average raw water quality (good to poor)	0-10*	_____	
3. Adjustment**			
Aeration for CO_2	2	_____	
pH adjustment	4	_____	
Stability or corrosion control	4	_____	
Taste and odor control	8	_____	
Color control	4	_____	
4. Treatment**			
Iron or Iron/Mn. removal	10	_____	
Ion exchange softening	10	_____	
Chemical precipitation softening	20	_____	
Coagulation – flocculation – sedimentation	15	_____	
Filtration	10	_____	
Reverse osmosis, electrodialysis, etc.	15	_____	
In-plant treatment of plant sludge	6	_____	
5. Fluoridation	5	_____	
6. Disinfection			
Chlorination or comparable	5	_____	
On-site generation of disinfectant	5	_____	
7. Laboratory Control by Plant Personnel			
Bacteriological / Biological complexity	0-10*	_____	
Chemical / physical complexity	0-10*	_____	
8. **TOTAL*** **		_____	

**Each category should be considered a major unit process and points assigned only once for each unit or combined unit, i.e. for iron removal using oxidation and precipitate removal by filtration, only add ten points for iron removal and nothing for filtration.

***If unique treatment plant conditions distort the point total, the certification board may adjust the facility classification. If it considers the point system does not reflect the actual complexity of the plant.

Wastewater Treatment Plants

Assign points for every item that applies:

Item	Points	Rating	
1. Size			
Maximum population equivalent (P.E.) served, peak day	1 pt. per 10,000 P.E. or part	_____	Max. 10 points
Design flow (avg. day) or peak month's flow, (avg. day), whichever is larger	1 pt. per MGD or part	_____	Max. 10 points
2. Effluent Discharge			
Receiving stream (sensitivity)	0-6*	_____	
Land disposal – evaporation	2	_____	
Subsurface disposal	4	_____	
3. Variation in Raw Wastes (slight to extreme)	0-6*	_____	
4. Pretreatment			
Screening, comminution	3	_____	
Grit removal	3	_____	
Plant pumping of main flow	3	_____	
5. PrimaryTreatment			
Primary clarifiers	5	_____	
Combined sedimentation/digestion	5	_____	
Chemical addition (except chlor., enz.)	4	_____	
6. Secondary Treatment			
Trickling filter w/sec. clarifiers	10	_____	
Activated sludge w/sec. clarifiers (including ext. aeration and oxidation ditches)	15	_____	
Stabilization ponds without aeration	5	_____	
Aerated lagoon	8	_____	
7. Advanced Waste Treatment			
Polishing pond	2	_____	
Chemical/physical – without secondary	15	_____	
Chemical/physical – following secondary	10	_____	
Biological or chemical/biological	12	_____	
Ion exchange	10	_____	
Reverse osmosis, electrodialysis	15	_____	
Chemical recovery, carbon regeneration	4	_____	
Oxygen generation on site	5	_____	
8. Solids Handling			
Thickening	5	_____	

	Anaerobic digestion	10	
	Aerobic digestion	6	
	Evaporative sludge drying	2	
	Mechanical dewatering	8	
	Solids reduction (incineration, wet oxidation)	12	
9.	Disinfection		
	Chlorination or comparable	5	
	On-site generation of disinfectant	5	
10.	Laboratory Control by Plant Personnel		
	Bacteriologial/Biological complexity	0-10*	
	Chemical/physical (complexity)	0-10*	
11.	**TOTAL****		

*See Table X (b).

**If unique treatment plant conditions distort the point total, the certification board may adjust the facility classification if it considers the point system does not reflect the actual complexity of the plant.

APPENDIX 7

ONTARIO REGULATION 435/93
(AS AMENDED BY REGULATION 154/98
AND 539/98)

REGULATION MADE UNDER THE ONTARIO WATER RESOURCES ACT

WATER WORKS AND SEWAGE WORKS

Appendix 7

Ontario Regulation 435/93
Regulation Made Under The
Ontario Water Resources Act
Water Works And Sewage Works

Definitions

1. In this Regulation,

"facility" means a wastewater collection facility, a wastewater treatment facility, a water distribution facility or a water treatment facility;

"operator" means a person who adjusts, inspects or evaluates a process that controls the effectiveness or efficiency of a facility, and includes a person who adjusts or directs the flow, pressure or quality of the water within a water distribution facility or the wastewater within a wastewater collection facility; (O.R. 539/98)

"operator-in-charge" means an operator who,

(a) has responsibility for the overall operation of a facility;
(b)
(b) sets operational parameters for a facility or for a process that controls the effectiveness or efficiency of a facility; or

(c) directs or supervises operators in a facility;
(d)

"professional engineer" means a professional engineer as defined in the Professional Engineers Act;

"wastewater collection facility" means the part of a sewage works that collects or transmits sewage but does not include the part of the sewage works that treats or disposes of sewage;

"wastewater treatment facility" means the part of a sewage works that treats or disposes of sewage but does not include the part of the sewage works that collects or transmits sewage;

"water distribution facility" means the part of a water works that supplies or distributes water but does not include the part of the water works that collects, produces or treats water;

"water treatment facility" means the part of a water works that collects, produces or treats water but does not include the part of the water works that supplies or distributes water.

Application

2.-(1) This Regulation applies to,

(a) water works to which subsection 52(1) of the Act applies;

(b) sewage works to which section 53 of the Act applies that are owned or operated by the Crown or a municipality, if the sewage received by the sewage works is treated; and

(c) sewage works to which section 53 of the Act applies that are not owned or operated by the Crown or a municipality, if any sewage received by the sewage works is,

(i) toilet, sink or culinary liquid waste, or
(ii) other sewage of a kind normally discharged from a residential subdivision, other than storm water, ground water, surface drainage or land drainage. (O.R. 539/98)

(2) Despite subsection (1), this Regulation does not apply to a water treatment facility that meets the following criteria:

1. The facility's average daily design flow or average daily flow in the peak month of the year, whichever is greater, is less than 200 cubic metres. (O.R. 539/98)

2. There is a period of at least one month in every year when the facility does not operate.

3. The facility does not treat water except for the purpose of disinfection.

4. In the opinion of the Director, the quality of the facility's raw water source is excellent.

5. The operator with responsibility for the overall operation of the facility has successfully completed a course approved by the Director relating to the operation of facilities that meet the criteria in paragraphs 1 to 4.

(3) Despite subsection (1), this Regulation does not apply to a water distribution facility that meets the following criteria:

1. The facility's average daily design flow or average daily flow in the peak month of the year, whichever is greater, is less than 200 cubic metres. (O.R. 539/98)

2. There is a period of at least one month in every year when the facility does not operate.

3. All water supplied or distributed by the facility is received from a water treatment facility that meets the criteria in subsection (2) and, in the opinion of the Director, the quality of the water received from the water treatment facility is excellent.

4. The operator with responsibility for the overall operation of the facility has successfully completed a course approved by the Director relating to the operation of facilities that meet the criteria in paragraphs 1 to 3.

(4) Despite subsection (1), this Regulation does not apply to sewage works described in clause 53 (6) (a) of the Act if,

(a) the sewage works have a design capacity in excess of 10,000 litres per day;
(b) more than one sewage works is located on a lot or parcel of land and they have, in total, a design capacity in excess of 10,000 litres per day; or
(c) the sewage works are not located wholly within the boundaries of the lot or parcel of land on which is located the residence or other building or facility served by the works. (O.R.154/98).

Classification of Facilities

3.-(1) For the purposes of this Regulation, water works and sewage works are divided into the following types of facilities:

1. Wastewater collection facilities.

2. Wastewater treatment facilities.

3. Water distribution facilities.

4. Water treatment facilities.

(2) Each type of facility is classified into Class I, Class II, Class III and Class IV facilities in accordance with the following rules:

1. Facilities listed in the Ministry of Environment and Energy publication available from the Director dated April 30, 1993 and entitled "Water and Wastewater Facility Classifications as of April 30, 1993" are classified in accordance with that publication.

2. Facilities not listed in the publication referred to in paragraph 1 are classified in accordance with Schedule 1.

3. Despite paragraph 1, a facility listed in the publication referred to in paragraph 1 shall be classified in accordance with Schedule 1 if the facility is reclassified under paragraph 3 or 4 of subsection 4(2).

4.-(1) The owner of a facility shall file an application with the Director for classification of the facility.

(2) The application shall be filed in accordance with the following rules:

1. If the facility started operation before this Regulation came into force or starts operation before February 1, 1994, the application shall be filed not later than February 1, 1994.

2. If the facility starts operation on or after February 1, 1994, the application shall be filed before the facility starts operation.

3. If a facility that has been classified under this section is to be altered, extended or replaced so that it will not meet the criteria in Schedule 1 for the same classification, the owner of the facility shall apply for a reclassification of the facility when approval of the alteration, extension or replacement is applied for under section 52 or 53 of the Act.

4. The Director may require a facility that has been classified under this section to apply for reclassification if section 3 or Schedule 1 is amended.

(3) The Director shall classify the facility in accordance with section 3 and shall issue a certificate of classification to the owner.

(4) The owner shall ensure that the certificate is conspicuously displayed at the facility or at premises from which the operations of the facility are managed.

(5) A facility that was classified before July 1, 1993 under the Water and Wastewater Utility Operator Certification Program administered by the Ministry and the Municipal Engineers Association shall be deemed to have been classified under this section.

(6) No application is required under paragraph 1 of subsection (2) in respect of a facility to which subsection (5) applies.

Licensing of Operators

5.-(1) For each type of facility, there shall be four classes of operators' licences, designated as Class I, Class II, Class III and Class IV.

(2) There shall also be a class of operators' licences for operators-in-training.

6.-(1) A person may apply to the Director for the issuance to the applicant of an operator's licence.

(2) A fee of $75 is payable at the time the application is made.

(3) No fee is payable for an operator-in-training's licence unless the applicant has held a licence issued under this Regulation in the preceding five years. (O.R. 539/98)

(4) The Director shall issue the licence if the applicant meets the qualifications set out in Schedule 2 for that class of licence and the required fee has been paid.

(5) The Director may refuse to issue a licence if the applicant is the holder of a licence that the Director is authorized under subsection 11(1) to cancel or suspend.

(6) The fee is refundable if the application is refused or the application is withdrawn.

(7) A licence expires three years after it is issued but may be reissued in accordance with this section.

(8) Despite subsection (7), if a person holds an operator-in-training's licence on the day Ontario Regulation 539/98 is filed with the Registrar of Regulations, the licence expires on the earlier of the following dates:

1. The fourth anniversary of the day Ontario Regulation 539/98 is filed with the Registrar of Regulations.

2. A date that is not earlier than the third anniversary of the day Ontario Regulation 539/98 is filed with the Registrar of Regulations and that is specified in a written notice sent by the Director to the person who holds the licence. (O.R. 539/98).

(9) An operator-in-training's licence that expired before the day Ontario Regulation 539/98 is filed with the Registrar of Regulations shall be deemed not to have expired and shall expire on the earlier of the following dates:

1. The fourth anniversary of the day Ontario Regulation 539/98 is filed with the Registrar of Regulations.

2. A date that is not earlier than the third anniversary of the day Ontario Regulation 539/98 is filed with the Registrar of Regulations and that is specified in a written notice sent by the Director to the person who holds the licence. (O.R. 539/98)

6.1 (1) A person may apply to the Director for the issuance to the applicant of a conditional operator's licence.

(2) Subsection (1) does not apply to a conditional operator-in-training's licence.

(3) A fee of $75 is payable at the time the application is made.

(4) The Director may issue the conditional licence if,

(a) the owner of one or more facilities satisfies the Director that the owner cannot readily obtain the services of an operator who holds a licence under section 6 of the class applied for under this section;

(b) the owner referred to in clause (a) gives the applicant and the Director an undertaking in writing to co-operate in facilitating compliance by the applicant with any conditions imposed under subsection (7); and

(c) the required fee has been paid.

(5) A conditional licence expires three years after it is issued or on such earlier date as may be specified in the licence but may be reissued in accordance with this section.

(6) A conditional licence is valid only in respect of the facilities referred to in clause (4) (a).

(7) A conditional licence is subject to such conditions as may be specified by the Director in the licence.

(8) The fee is refundable if the application is refused or the application is withdrawn. (O.R. 539/98)

7.- (1) A person who was certified as an operator before July 1, 1993 under the Water and Wastewater Utility Operator Certification Program administered by the Ministry and the Municipal Engineers Association shall be deemed to have been licensed under section 6.

(2) Subject to section 8, a person to whom subsection (1) applies shall be deemed to have the class of licence equivalent to the class of certification held by the person under the Water and Wastewater Utility Operator Certification Program on June 30, 1993.

(3) The licence of a person to whom subsection (1) applies expires three years after the person was last certified under the Water and Wastewater Utility Operator Certification Program but may be reissued in accordance with section 6.

8.- (1) A person who was employed as an operator on June 30, 1993 in a facility that was classified under the Water and Wastewater Utility Operator Certification Program administered by the Ministry and the Municipal Engineers Association may, not later than February 1, 1994, apply to the Director for the issuance to the applicant of an operator's licence for that type of facility equivalent to the class of the facility. (For example, a person who was employed as an operator on June 30, 1993 in a facility that was classified as a Class IV water distribution facility under the Water and Wastewater Utility Operator Certification Program may apply for a Class IV water distribution facility operator's licence.)

(2) The Director shall issue the licence if the person meets the experience qualifications established by Schedule 2 for that class of licence and the required fee has been paid.

(3) Subsection (1) applies whether or not the person was certified as an operator under the Water and Wastewater Utility Operator Certification Program.

(4) A licence issued under subsection (2) expires three years after it is issued.

(5) If, before a Class II, Class III or Class IV licence expires under subsection (4) or (6), the person who holds the licence obtains a mark that the Director considers satisfactory in an examination approved by the Director relating to the functions performed by that class of operator, the Director shall reissue the licence on payment of the required fee.

(6) A licence issued under subsection (5) expires three years after it is issued but may be reissued in accordance with subsection (5).

(7) If, before a Class II, Class III or Class IV licence expires under subsection (4) or (6), the person who holds the licence fails to obtain a mark that the Director considers satisfactory in an examination approved by the Director relating to the functions performed by that class of operator, the Director shall issue to the person a licence one class lower than the licence that was issued to the person under subsection (2), on payment of the required fee.

(8) A Class I licence issued under subsection (2) shall be reissued by the Director on payment of the required fee.

(9) A licence issued under subsection (7) or (8) or under this subsection expires three years after it is issued but shall be reissued by the Director on payment of the required fee.

(10) The Director may refuse to issue a licence under this section to a person who holds a licence that the Director is authorized under subsection 11(1) to cancel or suspend.

(11)The fee required for the issuance of a licence under this section is $75, but the fee is refundable if the licence is refused or the application for the licence is withdrawn.

9. The owner of a facility shall ensure that a copy of the licence of every licensed operator who is employed in the facility is conspicuously displayed at the operator's workplace or at premises from which the operations of the facility are managed.

10.-(1) A person who holds a Class I, Class II, Class III or Class IV wastewater treatment facility operator's licence shall be deemed to hold a Class I wastewater collection facility operator's licence.

(2) A person who holds a Class I, Class II, Class III or Class IV water treatment facility operator's licence shall be deemed to hold a Class I water distribution facility operator's licence.

11.-(1) The Director may cancel or suspend a person's licence if one or more of the following circumstances exist:

1. The licence was obtained by fraud, deceit or the submission of an application containing inaccurate information.

2. The person has not worked as an operator during the five previous years.

3. The person has been discharged from employment in a facility for gross negligence or for incompetence in the performance of the duties of his or her position, unless the person has not yet exhausted any rights of appeal available under a collective agreement.

4. The person has contravened section 19 or 20 and the contravention,

i. resulted in the discharge of a pollutant into the natural environment,
ii. had an adverse effect on the health or safety of an individual, or
iii. had an adverse effect on a process in the facility.

(2) When a person's licence is cancelled or suspended under subsection (1), the Director may issue a licence of another class to the person if the person meets the qualifications set out in Schedule 2 for that class of licence.

12.-(1) On payment of a fee of $50, the Director shall issue a replacement licence to an operator if,

(a) the operator's licence has been lost or destroyed; or

(b) the operator's name has changed and the original licence has been returned to the Director.

(2) The Director may refuse to issue a replacement licence if the applicant is the holder of a licence that the Director is authorized under subsection 11(1) to cancel or suspend.
Operating Standards

13.-(1) The owner of a facility shall ensure that responsibility for the overall operation of the facility is placed with an operator who holds a licence that is applicable to that type of facility and that is of the same class as or higher than the class of the facility. (For example, responsibility for the overall operation of a Class III water treatment facility must be placed with an operator who holds a Class III or Class IV water treatment facility operator's licence.)

(2) If the operator required by subsection (1) is absent or unable to act, responsibility for the overall operation of the facility may be placed with an operator who holds a licence that is applicable to that type of facility and that is not more than one class lower than the class of the facility. (For example, if the operator required by subsection (1) is absent or unable to act, responsibility for the overall operation of a Class IV wastewater collection facility may be placed with an operator who holds a Class III or Class IV wastewater collection facility operator's licence.)

(2.1) Subsection (2) does not permit responsibility for the overall operation of a facility to be placed with an operator who holds an operator-in-training's licence. (O.R. 539/98)

(3) Subsection (2) shall not be relied on by the owner of a facility for more than 150 days in any twelve-month period. (O.R. 539/98)

(4) The owner of a facility shall notify the Director without delay if the owner relies on subsection (2) for sixty days in any twelve-month period.

(5) The Director may direct that subsection (3) not apply to a facility for a time period specified by the Director if the Director is satisfied that the owner of the facility cannot reasonably comply with subsection (1) and the direction will not result in a significant risk to human health or the natural environment.

(6) Despite subsections (1) and (2), responsibility for the overall operation of a facility may be placed with a professional engineer who does not have the licence required by subsection (1) or (2) if the engineer has been employed in the facility for less than six months.

(7) This section does not apply until July 1, 1994.

14.-(1) In addition to the requirements of section 13, the owner of a facility shall ensure that every operator employed in the facility holds a licence applicable to that type of facility or a licence as an operator-in-training.

(2) Subsection (1) does not apply in respect of an operator who is a professional engineer if the operator has been employed in the facility for less than six months.

(3) Subsection (1) does not apply until February 1, 1994.

15. In the event of a strike or lock out involving operators employed in a facility, the Director may direct that sections 13 and 14 not apply to the facility for the duration of the strike or lock out if the Director is satisfied that the facility will be operated without a significant risk to human health or the natural environment.

16.-(1) The owner of a facility shall ensure that operators and maintenance personnel in the facility have ready access to comprehensive operations and maintenance manuals that contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the facility.

(2) The owner shall ensure that the manuals are reviewed and updated at least once every two years.

17.-(1) The owner of a facility shall ensure that every operator employed in the facility is given at least forty hours of training every year.

(2) The training may include, for example, training in new or revised operating procedures, reviews of existing operating procedures, safety training and studies of information and technical skills related to environmental subjects.

(3) The owner shall ensure that records are maintained of the training given under this section, including the names and positions of operators who attend training sessions, the dates of training sessions, the duration of each training session and the subjects considered at each training session.

(4) The owner shall submit copies or summaries of the records to the Director when requested to do so by the Director.

18. The owner of a facility shall ensure that records are maintained of the amount of time each operator works as an operator-in-charge.

19. An operator-in-charge shall,

(a) take all steps reasonably necessary to operate the processes within his or her responsibility in a safe and efficient manner in accordance with the relevant operations manuals;

(b) ensure that the processes within his or her responsibility are measured, monitored, sampled and tested in a manner that permits them to be adjusted when necessary;

(c) ensure that records are maintained of all adjustments made to the processes within his or her responsibility; and

(d) ensure that all equipment used in the processes within his or her responsibility is properly monitored, inspected and evaluated and that records of equipment operating status are prepared and available at the end of every operating shift.

20.-(1) The owner of a facility shall ensure that logs or other record-keeping mechanisms are provided to record information concerning the operation of the facility.

(2) Entries in the logs or other record-keeping mechanisms shall be made chronologically.

(3) No person shall make an entry in a log or other record-keeping mechanism unless the person is an operator-in-charge or is authorized to make an entry by the owner or an operator-in-charge.

(4) A person who makes an entry in a log or other record-keeping mechanism shall do so in a manner that permits the person to be unambiguously identified as the maker of the entry.

(5) An operator-in-charge or a person authorized by an operator-in-charge shall record the following information in the logs or other record-keeping mechanisms in respect of each operating shift:

1. The date, the time period and the number or designation of the shift.

2. The names of all operators on duty during the shift.

3. Any departures from normal operating procedures that occurred during the shift and the time they occurred.

4. Any special instructions that were given during the shift to depart from normal operating procedures and the person who gave the instructions.

5. Any unusual or abnormal conditions that were observed in the facility during the shift, any action that was taken and any conclusions drawn from the observations.

6. Any equipment that was taken out of service or ceased to operate during the shift and any action taken to maintain or repair equipment during the shift.

(6) The owner shall ensure that logs and other record-keeping mechanisms are accessible in the facility for at least two years after the last entry.

Schedule 1

FACILITY CLASSIFICATION POINT SYSTEMS

1. A wastewater collection facility to which this Schedule applies is classified in accordance with Table 1, based on the number of points applicable to the facility under the point system described in Table 2.

2. A wastewater treatment facility to which this Schedule applies is classified in accordance with Table 1, based on the number of points applicable to the facility under the point system described in Table 3.

3. A water distribution facility to which this Schedule applies is classified in accordance with Table 1, based on the number of points applicable to the facility under the point system described in Table 4.

4. A water treatment facility to which this Schedule applies is classified in accordance with Table 1, based on the number of points applicable to the facility under the point system described in Table 5.

5. (1) For the purpose of sections 2 and 4, the number of points applicable to a package facility under the point system described in Table 3 or 5 may be reduced by the Director if he or she is satisfied that the operational needs of the package facility are less than the operational needs of other facilities that, having regard only to the characteristics referred to in the applicable Table, have the same characteristics as the package facility. (O.R. 539/98)

   (2) In subsection (1),

   "package facility" means a wastewater treatment facility or water treatment facility where the treatment processes of the facility are contained in a plant that meets all of the following criteria:
   1. The plant has been manufactured as a complete unit.
   2. The plant has been preassembled and delivered in not more than four modules to the site where it is used.
   3. The plant has a design flow of 1,300 cubic metres per day or less. (O.R. 539/98)

Schedule 2

QUALIFICATIONS FOR OPERATORS' LICENCES

Operators-in-Training

1. The qualifications for an operator-in-training's licence are:

    1. The person must have successfully completed Grade 12 in Ontario or have educational qualifications that the Director considers equivalent.

    2. The person must have obtained a mark that the Director considers satisfactory in an examination approved by the Director relating to the functions performed by operators-in-training.

Class I Operators

2. The qualifications for a Class I operator's licence for a type of facility are:

    1. The person must have successfully completed Grade 12 in Ontario or have educational qualifications that the Director considers equivalent.

    2. The person must have at least one year of experience as an operator in that type of facility.

    3. The person must have obtained a mark that the Director considers satisfactory in an examination approved by the Director relating to the functions performed by operators with Class I licences for that type of facility.

Class II Operators

3. The qualifications for a Class II operator's licence for a type of facility are:

    1. The person must have a Class I or Class II operator's licence for that type of facility.

    2. The person must have successfully completed Grade 12 in Ontario or have educational qualifications that the Director considers equivalent.

    3. The person must have at least three years of experience as an operator in that type of facility.

    4. The person must have obtained a mark that the Director considers satisfactory in an examination approved by the Director relating to the functions performed by operators with Class II licences for that type of facility.

Class III Operators

4.-(1) The qualifications for a Class III operator's licence for a type of facility are:

1. The person must have a Class II or Class III operator's licence for that type of facility.

2. The person must,

i. have successfully completed Grade 12 in Ontario or have educational qualifications that the Director considers equivalent, and
ii. have successfully completed at least two years of additional education or training that, in the opinion of the Director, is relevant to the functions performed by operators of facilities.

3. The person must have at least four years of experience as an operator in that type of facility, including at least two years as an operator-in-charge in a Class II, Class III or Class IV facility.

4. The person must have obtained a mark that the Director considers satisfactory in an examination approved by the Director relating to the functions performed by operators with Class III licences for that type of facility.

(2) For the purpose of meeting the education and training qualification in subparagraph ii of paragraph 2 of subsection (1), an applicant for a licence may substitute up to one year of experience as an operator-in-charge in a Class II, Class III or Class IV facility for the equivalent length of education, but experience as an operator-in-charge used for this purpose shall not be used to meet the experience qualification in paragraph 3 of subsection (1).

Class IV Operators

5.-(1) The qualifications for a Class IV operator's licence for a type of facility are:

1. The person must have a Class III or Class IV operator's licence for that type of facility.

2. The person must,

i. have successfully completed Grade 12 in Ontario or have educational qualifications that the Director considers equivalent, and
ii. have successfully completed at least four years of additional education or training that, in the opinion of the Director, is relevant to the functions performed by operators of facilities.

3. The person must have at least four years of experience as an operator in that type of facility, including at least two years as an operator-in-charge in a Class III or Class IV facility.

4. The person must have obtained a mark that the Director considers satisfactory in an examination approved by the Director relating to the functions performed by operators with Class IV licences for that type of facility.

(2) For the purpose of meeting the education and training qualification in subparagraph ii of paragraph 2 of subsection (1), an applicant for a licence may substitute up to two years of experience as an operator-in-charge in a Class III or Class IV facility for the equivalent length of education, but experience as an operator-in-charge used for this purpose shall not be used to meet the experience qualification in paragraph 3 of subsection (1).

Special Rules - Professional Engineers

6. The experience qualifications established by this Schedule for a class of licence and type of facility do not apply to a professional engineer if the engineer obtains a mark that the Director considers above average in an examination approved by the Director relating to the functions performed by operators with that class of licence for that type of facility.

Special Rules - Education and Training

7. The following rules apply for the purpose of determining whether a person meets the education and training qualifications established by this Schedule:

1. If an applicant for a licence has not successfully completed Grade 12 in Ontario, the applicant may use his or her experience as an operator to meet that educational qualification, on the basis that each year of experience as an operator is equivalent to two years of elementary education or one year of secondary education, but years of experience as an operator used for this purpose shall not be used to meet the experience qualifications established by this Schedule.

2. The length of education or training obtained through specialized training sessions shall be determined on the basis that 450 hours of participation in specialized training sessions is equivalent to one year of education or training.

Special Rules – Experience

8. (1) The following rules apply for the purpose of determining whether a person meets the experience qualifications established by this Schedule for a Class II, Class III or Class IV licence:

1. An applicant for a licence may substitute education or training that meets the requirements of the education and training qualifications established by this Schedule, other than elementary or secondary education, for up to half of the experience as an operator required by this Schedule, but education or training used for this purpose shall not be used to meet the education and training qualifications established by this Schedule.

2. The Director may permit an applicant for a licence to substitute for the experience required by this Schedule experience as an operator in a different type of facility or experience in a facility other than as an operator, if the Director is of the opinion that the experience is relevant to the class of licence being applied for.

(2) Experience as an operator-in-training shall not be considered for the purpose of determining whether a person meets the qualification of at least two years of experience as an operator-in-charge established by this Schedule for a Class III or Class IV licence. (O.R. 539/98)

9. Where this Schedule provides that obtaining a mark that the Director considers satisfactory in an examination approved by the Director is a qualification for a class of licence, the Director may approve different examinations for different categories of applicants for that class of licence.

APPENDIX 8

ONTARIO NOTICE OF PROPOSAL FOR REGISTRATION – WATER AND SEWAGE WORKS

Appendix 8

Ontario Notice of Proposal for Registration – Water and Sewage Works

NOTICE OF PROPOSAL FOR REGULATION

Proposal Title:

Waterworks and Sewage Works

Regulation or Bill Number: O.R. 435/93

Short Description:

Two amendments to O.R. 435/93 are proposed:

1. A new category of licence called a "water quality analyst" will be created. The three licence requirements are:

(1) grade 12 or equivalent;
(2) successful completion of water lab analyst exam; and
(3) 2 years of water operating experience or 1 year of lab experience or successful completion of 18 hours of approved training in water analysis.

Changes under the Ontario Water Resources Act by the recent Drinking Water Protection Regulation (O. Reg 459/00) will allow certain drinking water quality parameters to be tested in a water facility, provided the tests are performed by individuals licensed under O.R. 435/93.

2. All operators must verify completion of 36 hours of approved training in the previous three years in order to renew their licence. Training must be approved by the Ministry, and may include formal courses on topics related to operations, approved municipal training, correspondence courses, approved on-the-job training and computer based training. This training requirement is in addition to training required under Section 17(1) of Reg 435/93 which states that the owner of the facility shall ensure every operator is given at least 40 hours of training every year.

This requirement will be phased in over a three year period, and will be completely in effect by September 1, 2003.

Purpose of the Proposal:

The proposed amendments will ensure that all persons who perform in-facility water tests demonstrate that they have the necessary experience, education, knowledge or supervision; and will toughen the existing training requirements for operators to ensure continual learning and development of skills throughout the operators' careers.

Other Relevant Information:

The first proposed amendment is related to the recent Drinking Water Regulation made under the Ontario Water Resources Act, which requires all laboratories or water treatment plant facilities which perform tests on certain drinking water quality parameters to be accredited. The first amendment in Reg 435/93 will allow certain in-facility tests to be performed by a licensed water quality analyst.