

Training and Certification Programs – A Necessary Part of Onsite/Decentralized Wastewater Treatment

Discussion paper for consideration of training and certification

DRAFT

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Training and Certification Programs – A Necessary Part of Onsite/Decentralized Wastewater Treatment

Abstract

Training and certification/license requirements are considered a necessary component to the effective utilization of onsite/decentralized wastewater treatment. While these treatment systems can provide a reliable method of wastewater treatment and can fit into the overall community wastewater treatment infrastructure, their appropriate use is contingent on effective siting, design, installation, inspection, monitoring, and operation and maintenance. The proper execution of these functions requires well-trained and competent practitioners. Training and certification/licensing is a key to assuring that the practitioners know their responsibilities, are accountable, and can fulfill their assigned roles.

There are training and certification requirements in most state onsite regulations. The requirements vary among the states and there are a number of approaches used to assure competency. Forty of the states do have some type of requirement in their onsite law and/or regulation. USEPA has been a strong advocate for training and certification for many years. Recently, it reinforced this position by including training and certification as a core element in its' *Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems*.

All of the interested parties and stakeholders benefit from training and certification. It is in the best interest of all to have competent practitioners so that public health and water quality are protected.

Introduction

California is in the process of developing and adopting its' first statewide regulations governing the use of onsite wastewater treatment systems. The enabling legislation (AB885) required developing standards or regulations dealing with the following items:

(b) Regulations or standards adopted pursuant to subdivision (a), shall include, but shall not be limited to, all of the following:

(1) Minimum operating requirements that may include siting, construction, and performance requirements.

(2) Requirements for onsite sewage treatment systems adjacent to impaired waters identified pursuant to subdivision (d) of Section 303 of the Clean Water Act (33 U.S.C. Sec. 1313(d)).

(3) Requirements authorizing a qualified local agency to implement those requirements adopted under this chapter within its jurisdiction if that local agency requests that authorization.

(4) Requirements for corrective action when onsite sewage treatment systems fail to meet the requirements or standards.

(5) Minimum requirements for monitoring used to determine system or systems performance, if applicable.

(6) Exemption criteria to be established by regional boards.

(7) Requirements for determining a system that is subject to a major repair, as provided in paragraph (2) of subdivision (a).

The legislation does not identify training and certification as a concern to be addressed by the regulations. The legislation, however, does provide through the ‘not limited to’ language the ability to broaden the scope of the regulations. Based on the experiences and practices of other states it is suggested that training and certification are important considerations to include in the regulations. Training and certification are fundamental to the appropriate application, regulation, and the ongoing monitoring and maintenance of onsite systems. They are one of the core elements needed for an effective management program and are basic to assuring systems perform to protect public health and water quality.

The following discussion examines the role of training and certification in onsite/decentralized wastewater treatment systems and their importance relative to compliance and assurance.

Background

Onsite /decentralized wastewater treatment systems are an integral part of our community infrastructure. Nationwide, more than 25% of all residences are currently served by these facilities with projections of nearly 35% of new development making use of these systems. In California the percentage of residences using onsite systems is smaller, approximately 10%, but this still represents 1.2 million treatment systems. While this 10% figure is low compared to the national average, more than half of the counties in California (30 of 58) have an onsite use rate of more than 25% (CWTRC, 2000). Therefore, in many areas of the State onsite/decentralized systems represent a significant part of the sewage treatment infrastructure. Population growth continues in California and this dictates that we must integrate onsite/decentralized options into wastewater/watershed management planning at the local, regional and state level.

The continued use of this method of wastewater treatment is well established and supported as appropriate and necessary (Response to Congress, USEPA 1997). The use of onsite wastewater systems is rapidly evolving from being perceived as a method of disposal to recognizing that the primary function of these systems is treatment – the treatment of wastewater to a level where it no longer poses a threat to public health or water quality. Indeed, the view is emerging that treated effluent provides the opportunity for some level of reuse of this water resource. Reuse, used here in the broadest sense, recognizes that treated wastewater is a potential resource in overall water management and sustainable development. Treated wastewater at a minimum recharges ground or surface waters and can be used for a variety of purposes depending on the level of treatment, for example subsurface drip dispersal for landscape irrigation. Water demands in California are great and effectively reutilizing wastewater should become part of the overall water resource strategy. New treatment technology, appropriate application of this technology and effective system management provides this opportunity. In order to achieve this end, practitioners need to be well versed in the principles and practices of using the technology.

Training and Certification: A Key Element

Key to the application and use of appropriate technology and effective system management are competent practitioners. Practitioners, service providers¹, include; engineers, designers, site evaluators, soil evaluators, regulatory personnel, system installers and contractors, and operations and maintenance personnel. The training and education of these varies but an effective onsite/decentralized infrastructure requires competent practitioners. It is now well recognized that training and education are integral to successful and appropriate use of onsite/decentralized wastewater treatment system technology. Hoover, et. al. (1995) describing the North Carolina operator certification program wrote: “We now recognize that decentralized technologies can only be permanent solutions to wastewater treatment needs if the systems are diligently operated and maintained.” They further went on to state that:

“ Therefore, a big need exists for trained people who can understand, operate, and maintain these evolving systems. More sophisticated management will come at some increased cost. But, better management will enable the use of alternative on-site wastewater treatment systems and facilitate development of new technologies. A specific training program is needed to develop and maintain the expertise of on-site system professionals who will operate and maintain these systems.”

Nationally, USEPA has been a strong proponent of training programs by supporting such efforts as the Small Flows Clearing House, the National Environmental Training Center for Small Communities, the National Decentralized Wastewater Capacity Development Project and other initiatives. All of these efforts are directed towards developing onsite/decentralized wastewater treatment programs.

In the 1997 Response to Congress, EPA identified that professional training and certification programs are essential to address the barrier that lack of knowledge poses to the utilization of onsite systems. In the report EPA cited the North Carolina operator certification program as an example of how a much broader range of advanced onsite technologies can be utilized if professional, certified operators manage them. The report goes on to say that training and certification programs should be a precursor to the broad scale use of decentralized technologies.

Recently the United States Environmental Protection Agency (USEPA) released the *Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems* (2003). The guidelines recognize the importance of training and certification programs as a part of onsite/decentralized management by stating in part:

“The models [management levels] are built around ensuring accountability and competency of the regulators and service providers through certification and continuing education, owners through education and/or inspection requirements, and third-party managers through contract and permit stipulations to achieve their goals.”

Clearly, certification and training are considered an integral part of a successful management program. In the *Draft Handbook for Management of Onsite and Clustered*

¹ This report uses the terms ‘service provider’ and ‘practitioner’ as inclusive of all the persons that practice in the onsite/decentralized field. The terms are used interchangeably.

(Decentralized) Wastewater Treatment Systems (2003), which is used as the supporting and companion document to the *Voluntary Guidelines* it is stated that:

“Certification programs for inspectors, installers, and septage haulers provide assurance that systems are installed and maintained properly. States are beginning to require training, certification, and/or licensing for all service providers to ensure that activities conducted by providers comply with program requirements. Violation of program requirements or poor performance can lead to revocation of certification and prohibitions on installing or servicing onsite systems. This approach, which links professional performance with economic incentives, is highly effective in maintaining compliance with onsite program requirements. Programs that simply register service providers or fail to take disciplinary action against poor performers cannot provide such assurances.”

This position has evolved as the importance of onsite/decentralized systems as integral to our community infrastructure has developed. Presently, most of states have some form of certification and training in their state regulations (see Table A). Several states have had these in place for more than ten years. As noted above, effective certification and training programs broaden the options open to communities by making more treatment technologies available since there are trained and certified personnel available to site, design, inspect, install, operate, and maintain them.

In California, the need for training and some type of certification was identified nearly 10 years ago as an issue regarding the use of onsite/decentralized treatment systems. The California State Water Resources Control Board, in its 1994 report: *Management Measures and Implementation for New and Existing Onsite Sewage Disposal Systems* identified education and training as one of the 14 issues for concern. The following two statements are extracted from the report concerning the education and training issue:

“Specifically, there is a serious need for better education and training for design professionals, local and state regulatory personnel and system installer[s].”

“Among other equally pertinent activities intended to improve OSDS [Onsite Sewage Disposal Systems] understanding and use, the proposed center would provide educational workshops and seminars and a voluntary certification program for designers, installers, and regulators of OSDS.”

This report identified the need for training and a voluntary certification program for a part of the practitioner community. It did not identify some practitioners now recognized as essential such as operations and maintenance personnel. At the time of the report, with the exception of a few jurisdictions (e.g., Sonoma County, Santa Cruz County, Stinson Beach, Georgetown Divide PUD), California did not have much experience with the operations and maintenance requirements of the emerging treatment technologies. There is now a much fuller appreciation of the need for training as evidenced by the development of the California Wastewater Training and Research Center (CWTRC) at the California State University, Chico and growth of the California Onsite Wastewater Association into a statewide organization representing all of the practitioners and advocating for training and certification. USEPA Region IX recognizes this need and has provided funding to help offset training registration fees for regulators to attend CWTRC courses.

It is clear that as our understanding of the role of onsite/decentralized has evolved so has our understanding of the importance of well-trained and qualified practitioners. This will become increasingly important as treatment technology is utilized and developed to address treatment needs for public health and/or environmental purposes. It requires well-trained, competent, and accountable practitioners to assure that systems perform as needed to meet treatment/performance standards. Certification and training can help assure that practitioners will be available to meet the challenge.

Certification and Management Programs

There is a direct connection between implementing a successful management program and the training and certification of practitioners. Indeed, as noted above, there is a clear connection between training and certification and effective utilization of onsite/decentralized systems.

The *Draft Handbook* (USEPA, 2003) describes what constitutes an effective management program and lists thirteen elements needed. The thirteen elements are placed into three functional categories: 1) program planning and administration, 2) treatment system installation and operation oversight, and 3) compliance assistance and assurance. The thirteen elements are described in the table below:

Table 2-1. Functional categories of management and program elements.

Category	Management program elements
Program administration	Public education and participation Planning Establishment of performance requirements Record keeping, inventories, and reporting Financial assistance and funding
System installation and operation oversight	Site evaluation System design Construction or installation Operation and maintenance Residuals management
Compliance assistance/assurance	Training and certification/licensing of service providers Inspections and monitoring Corrective actions and enforcement

Training and certification is one of the thirteen elements and is assigned to the compliance and assistance/assurance functional category. Therefore, effective compliance requires training and certification in addition to the more traditional elements of inspection, monitoring, corrective action and enforcement. It is necessary to have trained and qualified practitioners and one way to assure this is by having a training and certification program in place. A summary of the training and certification element approaches follows:

Table 2-12. Certification and licensing approaches

Program element	Basic approach	Intermediate approach	Advanced approach
Certification/licensing of service providers	Require homeowners to use only state or tribal registered/licensed service providers.	Support more comprehensive state/tribal requirements for certificate or license. Create and disseminate lists of acceptable service providers contingent on their accuracy of reporting and service complaint investigations.	Develop inspections and performance reviews for approval of service providers in district. Implement supplemental programs specific to district for service providers seeking to perform services based on local protocols.

It should be noted that some form of training and certification is necessary for all three of the approaches, from basic to advanced. This means that any effective management program needs a training and certification program to be effective.

While certification and training is listed as one of the elements it should be noted that it is a major component in a number of the other elements. Below are Tables: 2-6 Site evaluation approaches; 2-8 Design program approaches; 2-9 Construction/installation approaches; 2-10 Operation and maintenance approaches; and 2-11 Residuals management approaches, describing five of these elements that have been extracted from the EPA *Draft Handbook* to demonstrate this point. The reference to certification & training has been highlighted in **bold** type.

Table 2-6. Site evaluation approaches

Program element	Basic approach	Intermediate approach	Advanced approach
Site evaluation	Require assessment of site hydraulic acceptance and other physical features, including slope and vertical and horizontal setbacks for soil-based systems to determine compliance with prescriptive rules. Require licensed/certified site evaluators.	Prescribe broader set of site conditions to permit prescribed alternative technologies. Require licensed/certified site evaluators. Designate alternative systems for sites not meeting conditions prescribed for conventional systems.	Provide protocol for comprehensive site assimilative and treatment capacity. Characterize critical design and performance requirements and boundaries. Provide supplemental certification/licensing training for site evaluators to meet local needs.

Table 2-8. Design program approaches

Program element	Basic approach	Intermediate approach	Advanced approach
Design	Design only conventional septic tank/gravity fed soil discharging systems on sites meeting code-described prescriptive criteria. Require state certified/licensed designers.	Allow limited number of alternative designs on certain specific non-compliant sites. Require state certified designers. Provide potential for engineered alternative designs for large systems.	Institute protocols for use of risk-based designs based on site evaluation results and specific wastewater sources. Provide supplemental training and licensing/certification for designers based on specific needs of local water resources.

Table 2-9. Construction/installation approaches

Program element	Basic approach	Intermediate approach	Advanced approach
Construction/installation	Construction permit granted based on site evaluation, system design and installation by licensed/certified site evaluators, designers, and installers. Inspect system prior to backfilling to confirm that installation or complies with design.	Use more proactive inspection program during the construction phase Maintain and disseminate list of locally approved installers based on performance.	Create protocols for installation procedures and contingencies with proactive inspection. Provide extensive construction oversight for all critical steps. Develop supplemental training and licensing programs for installers that deal with local conditions and requirements.

Table 2-10. Operation and maintenance approaches

Program element	Basic approach	Intermediate approach	Advanced approach
Operation and maintenance	O/M educational materials circulated to system owners; complaint response protocols published; O/M reminders sent to system owners; and use of only certified/licensed O/M providers.	Maintenance contracts and reporting required for mechanical systems; operating permits renewable upon reported completion of required O/M tasks and inspections; disseminate list of acceptable licensed/certified O/M providers based on complaint investigations.	Trained, certified service providers handle O/M tasks for all systems in accordance with established protocols; supplemental training and certification programs provided or supported by RME through training centers or other means; O/M provider performance reviews frequently-updated and approval list dissemination.

Table 2-11. Residuals management approaches

Program element	Basic approach	Intermediate approach	Advanced approach
Residuals management	Assure that residuals are being reused or managed in compliance with applicable rules; educate and remind owners of the need to inspect and/or pump treatment tanks at regular intervals; and require only state-certified/licensed O/M residuals handlers and approved sites.	Require homeowners and licensed/certified service providers to report when residuals are removed and tanks inspected in order to renew operating permit; maintain and disseminate list of acceptable O/M service providers based on investigated complaints.	Create and administer tracking, inspection and monitoring plan for all aspects of residuals removal, hauling and reuse/disposal; provide any necessary supplemental training and registration/licensing programs for local O/M providers or arrange it with training centers and universities; and employ only approved providers.

These tables confirm that certification and training are important components to these other elements. Certification and training form the core assurance mechanisms for these other elements. Therefore, all management programs, even using the basic approach, need certification and training to assure effective site evaluation, design, construction/installation, inspection, operation and maintenance, and residuals management. Any system, regardless of the complexity of the technology or the receiving environment needs knowledgeable persons overseeing all aspects.

EPA’s *Voluntary Management Program* establishes five suggested management levels and all of these require trained and qualified service providers. The management levels are hierarchical, from level I to level IV, with level I being the least complex. The management program needed is determined by the complexity of the treatment systems and /or the sensitivity of the receiving environment, which in turn determines the specific type of training/certification needed. This should not imply, however, that practitioners need less training/certification at the ‘lower’ management level, but rather that each level may require specific types of training that addresses the type of technology and/or the risk to the receiving environment.

Accepting that onsite/decentralized systems are a permanent part of the community infrastructure requires that we rethink the importance of proper design, installation and maintenance of these systems. One can make the argument that the most careful site evaluation, system design, and system installation needs to take place with a traditional, gravity dosed system. These systems, once operational, rely on essentially passive processes to provide the treatment. Once operational they are typically not adjusted and treatment performance – the natural chemical physical and biological processes – is a function of the siting, design, installation, and operation.

Training and Licensing/Certification Programs – Officially Authorized to Practice

Programs can take many forms ranging from a simple recordation of practitioners, essentially a record keeping function, to programs that require training, examination, continuing education, renewal, and penalty and revocation procedures for all of the onsite professionals. One confusing aspect of reviewing the various state requirements is that the terminology is not consistent. The use and meaning of the terms to describe individuals officially authorized to practice varies. The terms “registration”, “certification”, “license”, “permitted” and “approved” can all be found in one state regulation or another. To illustrate, registration in one state may be the simple recordation (a listing) of practitioners (e.g., Ohio) while in another it may require training, examination, continuing education, renewal, etc (e.g., Florida). Therefore, comparing registration, certification, and licensing programs from one state to the next requires an understanding of specifically how the terms are used in any given state (see the text box for a dictionary definition). Following are some examples of how various states address this issue with the identifying term (registration, certification, license, etc.) in bold. Selected text from all of the state regulations can be found in Appendix II.

Minnesota for example requires that a business must have an Individual Sewage Treatment Systems (ISTS) **Registered Professional** with a specialty in the applicable license category to qualify for an ISTS license. That individual must complete the registration requirements for that specialty and is termed the designated registered professional. In order to become a registered professional an individual must meet the state training, examination and experience requirements for working with ISTSs in at least one of five specialty areas. State, county, township and city government employees with ISTS duties must also be registered (Minnesota Rule chapter 7080).

The five registration specialty areas are:

1. Designer I (inspection, site evaluation and design),
2. Designer II (site evaluation and design),
3. Installer,
4. Inspector, and
5. Pumper.

New Jersey has a voluntary **registration** program for individuals involved in subsurface sewage disposal system site evaluation, design, construction, inspection and regulation administered by the State. There are five categories of registration (New Jersey Administrative Code 7:9):

Registration
1: the act of registering
2: an entry in a register
Register
2 b: a roster of qualified or available individuals <a civil service <i>register</i> >
Registering
1 a: to make or secure official entry of in a register
Licensing
1 b: to permit or authorize especially by formal license
2: to give permission or consent to
License:
2 a: a permission granted by competent authority to engage in a business or occupation or in an activity otherwise unlawful
Certification
1: the act of certifying: the state of being certified
Certify
1 c: to attest as being true or as represented or as meeting a standard
Source - Merriam-Webster online (2002), Merriam-Webster,

1. septic system enforcement officer- includes licensed professional engineers, licensed health officers or licensed registered environmental health specialists, acting as the authorized agent for the administrative authority, who approve, permit, certify or license the construction, installation, alteration, repair or operation of individual subsurface sewage disposal systems or who review engineering plans, witness site evaluation and testing, inspect construction or make any determinations relied upon for the granting of such approvals, permits, certifications or licenses.
2. site evaluator- includes licensed professional engineers, licensed health officers, licensed registered environmental health specialists or soil scientists who perform site evaluation, soil evaluation or soil testing.
3. septic system designer- includes licensed professional engineers who prepare engineering plans and specifications for the construction or alteration of individual subsurface sewage disposal systems.
4. septic system installer- includes persons who construct, install or alter individual subsurface sewage disposal systems in accordance with approved engineering plans and specifications or who repair systems
5. septic system inspector- includes solid waste haulers, licensed professional engineers, licensed health officers or licensed registered environmental health specialists who perform inspections of individual subsurface sewage disposal systems

The stated purpose of the registration is to provide a means for the dissemination of technical information and training to all of the practitioners in the onsite field. The New Jersey program is the most comprehensive voluntary program.

North Carolina requires that individuals engaged in construction, installation, operation and repair (Subsurface Water Pollution Control System Operator) be certified by the state Water Pollution Control System Operators Certification Commission. **Certification** is granted after meeting certain prerequisites and completion of a subsurface water pollution control system operator training school sponsored or co-sponsored by the Commission. These individuals must then be registered with the local health department to practice. Therefore, the state certifies the practitioner and the local jurisdictions have a **registration** program for the practitioner.

Delaware has a **licensing** program that has eight categories:

1. Class A - Percolation Tester: The Class license authorizes the performance of percolation tests and other types of infiltrometer testing.
2. Class B - Designer: design of conventional on-site wastewater treatment and disposal systems that utilize gravity distribution systems for seepage beds and seepage trenches and lift pump stations.
3. Class C - Designer: the design of conventional and alternative on-site wastewater treatment and disposal systems and all pressure distribution systems.
4. Class D - Site Evaluator: performance of site soil evaluations, percolation and/or permeability tests or hydraulic conductivity tests.

5. Class E - System Contractor: construction, repair and installation of on-site wastewater treatment and disposal systems.
6. Class F - Liquid Waste Hauler: removal or disposal of the solid and liquid contents of septic tanks, cesspools, seepage pits, holding tanks or other wastewater treatment or disposal facilities.
7. Class GB - Designer: design of combined well and conventional on-site wastewater treatment and disposal systems that utilize gravity distribution systems for bed and trench designs.
8. Class GC - Designer: design of combined well and conventional and alternative on-site wastewater treatment and disposal systems and all pressure distribution systems.

Florida has a **registration** program for all persons that contract or advertise to provide services to the public performing services related to any of the following activities in the onsite sewage treatment and disposal industry:

1. Installation of onsite sewage treatment and disposal systems,
2. Repair of onsite sewage treatment and disposal systems,
3. Modification of onsite sewage treatment and disposal systems,
4. Maintenance of onsite sewage treatment and disposal systems,
5. Septic tank pumping and septage disposal services, excluding companies which only provide portable toilet or temporary holding tank services,
6. Abandonment of an onsite sewage treatment and disposal system.

Registration requires examination and there are continuing education requirements for registration renewal.

Idaho uses the term **registration permit** for onsite installers. Two (2) types of installer permits are available:

1. A standard and basic alternative system installer's registration permit.
2. A complex alternative system installer's registration permit is required to install evapotranspiration systems, extended treatment systems, lagoon systems, large soil absorption systems, pressure distribution systems, intermittent sand filter, in-trench sand filter, sand mound or other systems as may be specified.

The program includes an examination, annual renewal, continuing education (refresher course every three years) and the posting a bond of five thousand dollars (\$5,000) for standard and basic alternative systems or fifteen thousand dollars (\$15,000) for complex alternative systems.

Mississippi uses all three terms, **registration**, **certification**, and **licensing**. Installers are certified with examination, annual renewal and continuing education requirements, septic tank pumpers are licensed with annual renewal and equipment inspection and manufacturers are registered with annual renewal.

South Dakota has an installer **certification** program with an examination and a five-year renewal period. Renewal requires reexamination. No continuing education is required.

Tennessee requires that soil consultants must receive **approval** from the state **to practice** and must pass a written examination to demonstrate mastery in soil science. Installers must have a valid **permit** for constructing, installing, altering, or extending or repairing a subsurface sewage disposal system. The permit requires an examination and must be renewed annually.

Some states require only registration with no specific training or examination. For example, Ohio requires **registration** of installers of household sewage disposal systems. There is a registration fee and annual renewal.

These examples offer an idea of the range of approaches used by states to address the training and certification issue. Table A provides a summary of state programs and keep in mind that the terminology is not consistent so look at the requirements.

A good example of the justification for requiring these programs is well stated in the Washington State regulations:

RCW 18.210.005 Findings -- Purpose -- Prohibition.

(1) In order to safeguard life, health, and property and to promote the public welfare, the legislature finds that it is in the public interest to permit the limited practice of engineering by qualified individuals who are not registered as professional engineers under chapter 18.43 RCW. The increased complexity of on-site wastewater treatment systems, changes in treatment technology, and the need to protect ground water and watershed areas make it essential that qualified professionals design the systems. Furthermore, the legislature finds that individuals who have been authorized by local health jurisdictions to design on-site wastewater treatment systems have performed these designs in the past. However, it is desirable to establish a statewide licensing program to create uniform application of design practices, standards for designs, individual qualifications, and consistent enforcement efforts applicable to all persons who design on-site wastewater treatment systems, including persons licensed to practice as professional engineers under chapter 18.43 RCW. It is further desirable to establish a certification program applicable to all persons who inspect or approve on-site wastewater treatment systems on behalf of a local health jurisdiction.

While this language is specific to design and inspection, the rationale for requiring training and certification is well stated: “The increased complexity of on-site wastewater treatment systems, changes in treatment technology, and the need to protect ground water and watershed areas make it essential that qualified professionals design the systems... it is desirable to establish a statewide licensing program to create uniform application of design practices, standards for designs, individual qualifications, and consistent enforcement efforts applicable to all persons who design on-site wastewater treatment systems,...” This is a good summary of the case for training and certification.

Interpreting Table A

Table A is based on excerpts from state regulations concerning training, registration, certification, and licensure requirements for persons working in the various disciplines involved with onsite wastewater. Several states have very detailed programs that include all types/categories of workers and several states have no requirements at all. The review only includes requirements found in regulations specific to onsite/decentralized and does not include general state licensure requirements for practice in certain professions (e.g., engineers, environmental health specialists, contractors, etc.). These professions are included if they are identified in the onsite regulations as needing to meet specific training and/or certification requirements in order to practice in the field. For example, four states have specific onsite related requirements for regulators in addition to the more general registration as an environmental health specialist/sanitarian. There is a range of approaches from voluntary to mandatory.

Practitioners are separated out into broad categories across the top of the table. This is an arbitrary classification and the 'best fit' is used when translating a practitioner type from the actual regulation. The purpose of the table is to provide an overview of requirements and an appreciation for the variety of approaches.

The results demonstrate that at least forty states have requirements specific to practice in onsite/decentralized wastewater. The contractor/installer category is the most regulated group in this regard.

Manufacturer Certification

Over the past number of years proprietary equipment manufacturers have been introducing new products that are more reliable and provide more effective treatment. They are striving toward 'plug and play' designs that can provide consistent performance and that also allow for more predictable and consistent operation and maintenance requirements. They are also incorporating system monitoring capabilities that allow for real time monitoring and notification of system performance.

Many manufacturers have identified the need for trained service providers by requiring that manufacturer representatives, equipment installers, and operations and maintenance personnel must receive certification and training to handle their product. A number of manufacturers are developing their own certification programs to ensure their product is installed and operated properly. Equipment manufacturers recognize that the success of their product is tied directly to the successful operation of their systems over time. For these reasons, they realize that they must have installers and service providers that can O&M their product efficiently and effectively while keeping cost considerations in mind to remain competitive. These programs are in addition to any state or local certification requirements.

This type of certification program can augment or in fact substitute for state or local requirements if a mechanism is in place to validate the manufacturer's program. Certainly in the case of proprietary systems, this may be an effective option as it can be argued that it is in the best interest of the manufacturer to have their product perform. Assurances can be built in to satisfy state and local concerns. For example, the manufacturer may be required to provide the following:

1. hours of initial training,
2. continuing education requirements,
3. testing/examination requirements,
4. current listing of certified service providers and the product(s) certified for; and
5. course content including a training manual and training material provided. The training manual should be reflective of the product O&M manual.

This information can then be reviewed by the regulatory authority to determine if the manufacturer's program is adequate. This method of certification may also overcome some of the issues involving government/university/training center concerns over conflict of interest and/or product endorsement.

Several states have developed a manufacturer certification program. For example, Kentucky has a program for operator certification very similar to that described above. The Kentucky program requires that any onsite sewage system with a permanent operation and maintenance contract as a condition of approval may only be operated and maintained by a Certified Operator. The manufacturer must attest that the individual has been properly trained to operate and maintain the particular type of system and is acting as an authorized representative of the manufacturer. The local administrative body then issues the Certified Operator certificate.

The manufacturers training program for certified operators, certified inspectors, and certified installers includes the following requirements (Division of Public Health Protection & Safety Memorandum - April 13, 2000, PIM 00-01 Operation and Maintenance of On-site Sewage Systems):

1. Any person wishing to become a Certified Operator of these alternative systems; or a Certified Inspector wishing to utilize these alternative systems; or a Certified Installer wishing to install these alternative systems, shall be trained and certified by the manufacturer of the particular alternative system and shall maintain the certification as per the manufacturer's requirements.
2. The Department for Public Health shall approve the training material and courses provided by the manufacturer.
3. Training shall include an instructional manual for each person provided by the approved manufacturer that covers all aspects of the system. Such information shall include but not be limited to the following:
 - A. How the system works
 - B. Sizing and design
 - C. Construction and installation procedures
 - D. Inspection procedures
 - E. Operation and maintenance requirements for the particular kind of system, including trouble-shooting procedures
 - F. Schematics of all system components
 - G. Schematics of typical system layout showing all components
 - H. Warranty information

Louisiana has a program that requires proprietary system installers and operations and maintenance personnel (referred to as sub-manufacturers) must have an endorsement and certification from the manufacturer. Certification is required for each brand of plant [proprietary system] the individual wants to construct/operate. The individual then can apply for and receive a license (Sub-Manufacturers License) from the state for that particular treatment unit/device.

A major concern in many states and local jurisdictions is product approval. One of the issues with product approval, usually proprietary devices, is their reliability and continuing performance. To help alleviate some of this concern and as a condition of product approval, manufacturers should have a certification program for designers, installers, operations and maintenance personnel and other service providers. This would demonstrate their commitment to their product over the long term and would also result in functional operations and maintenance manuals.

Benefits of Training and Certification/licensing

Training and certification/licensure programs benefit all of the stakeholders involved with onsite/decentralized wastewater treatment, including property owners/consumers, the general public, regulatory personnel, private sector service providers, manufacturers and

government policy/decision makers. Each of these groups has an interest in assuring that treatment systems perform as needed. A well trained competent workforce will help establish public confidence and confidence of all of the stakeholders in the utilization of onsite/decentralized treatment systems as an integral part of the community infrastructure. Examples of specific interests for the groups are:

1. Property owners/consumers need assurances that their investment is being protected by competent practitioners at all stages of system siting, design, installation, inspection, operation and maintenance. It is the consumer, after all, that is ultimately responsible and should therefore be entitled to quality service that training and licensure/certification helps provide.
2. The general public, the community, needs assurance that the use of onsite/decentralized systems does not present a threat to public health or water quality. They must have confidence that this infrastructure option is properly managed and maintained. A competent, well-trained practitioner community can help provide this assurance. While not a guarantee, training and certification/licensure does help to establish a base-line standard of practice and quality control.
3. Regulatory personnel need assurances that the service providers are trained and competent to fulfill their role in the design, installation and operation and maintenance of treatment systems. These personnel must be knowledgeable concerning onsite/decentralized wastewater treatment systems. Their decisions should be based on a thorough understanding of the principles of wastewater treatment, available treatment technology and how it functions, the appropriate use of these technologies, and the transport and fate of wastewater constituents. It should be evident that these personnel need adequate training to provide effective oversight. They need to have a firm knowledge base to make valid judgments on the use of onsite/decentralized systems. The regulatory function should be ensuring that systems are sited, installed and perform as needed and a well-trained service provider community can help to ensure that outcome.
4. Manufacturers need assurances that competent persons are installing, operating and maintaining their product as well as the technologies of their competitors. Technologies that fail due to inadequate servicing reflect on the entire industry. It is in the best interest of equipment manufacturers to have well trained and licensed/certified practitioners. They also need assurances that regulatory personnel are knowledgeable concerning treatment system technology and the appropriate application of that technology.
5. Service providers need assurances that they are playing on a level playing field and that their particular segment of the industry maintains a basic standard of practice. They need to know that their investment in training results in benefits to their business. A basic standard of practice helps to promote public confidence. One way to help assure this is by requiring training and licensure/certification.

6. Local and state policy/decision makers need to have confidence in the ability of practitioners to perform effectively in order to consider onsite/decentralized systems as viable options in their infrastructure and water/wastewater management planning. The practitioners must perform so that the systems perform and help ensure public health and water quality. Training and certification/licensure helps to assure practitioner performance.

All of these stakeholder groups must have confidence in the practitioners involved in the onsite program. A successful management program relies on all of the participants understanding their role and responsibilities and effectively performing their respective duties. Certification and licensing also provides a measure of accountability in that there are typically revocation policies that go along with the certification/licensure. Again, onsite/decentralized systems are an investment in the community's infrastructure, and as briefly outlined above, all stakeholders have an interest that this treatment option is successful and training and certification/licensure is one way to help assure this.

The driving force for a program and the level of program can be initiated by any of the stakeholder groups involved with onsite/decentralized systems. While the initial impetus may be from one group (e.g., engineers, regulators, consumers, etc.) the resulting program typically involves all of the stakeholders coming to some consensus as to the type of program necessary. This process is, however, dynamic as changes in technology and changes in the general understanding of how systems operate and relate to the environment results in reevaluating training needs and accountability. It is essential that qualified professionals are involved with these systems (Noah, 2000).

Summary

Onsite/decentralized onsite treatment systems can be used effectively to provide a reliable method of wastewater treatment. These systems fit into the overall community wastewater treatment infrastructure. Their appropriate use is contingent on effective siting, design, installation, inspection, monitoring, and operation and maintenance. These are assured by a management program that defines and assigns roles, responsibilities, and accountability to all the practitioners. Training and certification/licensing is a key component to assuring that the practitioners can fulfill their assigned roles.

Most states have adopted regulations requiring some form of training and certification for onsite practitioners. The USEPA has vigorously encouraged these programs through its technical assistance programs as well as incorporating training and certification into a variety of guidance and technical documents.

The California State Water Resources Control should consider including training and certification as part of the pending regulations. The benefits are well established and necessary.

References

California Code of Regulations, Division 7 of the Water Code, Chapter 4.5, Section 13290.

California Water Resources Control Board, (1994), *Report of the Technical Advisory Committee for Onsite Sewage Disposal Systems*, Sacramento, CA November 1994.

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Hoover, M.T., T.A. Disy, M.A. Pfeiffer, N. Dudley, and R.B. Mayer. 1995. *On-Site System Operation and Maintenance Operators Manual*, The National Environmental Training Center for Small Communities, West Virginia University, Morgantown, WV

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Louisiana Sanitary Code, 13:014-1

Massachusetts Environmental Code. Title 5, 310 CMR 15.00.

Mississippi State Department of Health, 2.0 Regulation Governing Individual Onsite Wastewater Disposal, MSDH 300-Section 02A

Minnesota Statutes. 2000. Chapter 115, Section 115.55

New Jersey Administrative Code, 7:9A-3.17 Registration of personnel

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U.S. Environmental Protection Agency (2003), *Draft Handbook for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems* (2003)

Appendix I – Chapter 4.5. Onsite Sewage Treatment Systems (AB885)

SECTION 1. Chapter 4.5 (commencing with Section 13290) is added to Division 7 of the Water Code, to read:

CHAPTER 4.5. ONSITE SEWAGE TREATMENT SYSTEMS

13290. For the purposes of this chapter:

(a) "Local agency" means any of the following entities:

(1) A city, county, or city and county.

(2) A special district formed pursuant to general law or special act for the local performance of functions regarding onsite sewage treatment systems within limited boundaries.

(b) "Onsite sewage treatment systems" includes individual disposal systems, community collection and disposal systems, and alternative collection and disposal systems that use subsurface disposal.

13291. (a) On or before January 1, 2004, the state board, in consultation with the State Department of Health Services, the California Coastal Commission, the California Conference of Directors of Environmental Health, counties, cities, and other interested parties, shall adopt regulations or standards for the permitting and operation of all of the following onsite sewage treatment systems in the state and shall apply those regulations or standards commencing six months after their adoptions:

(1) Any system that is constructed or replaced.

(2) Any system that is subject to a major repair.

(3) Any system that pools or discharges to the surface.

(4) Any system that, in the judgment of a regional board or authorized local agency, discharges waste that has the reasonable potential to cause a violation of water quality objectives, or to impair present or future beneficial uses of water, to cause pollution, nuisance, or contamination of the waters of the state.

(b) Regulations or standards adopted pursuant to subdivision (a), shall include, but shall not be limited to, all of the following:

(1) Minimum operating requirements that may include siting, construction, and performance requirements.

(2) Requirements for onsite sewage treatment systems adjacent to impaired waters identified pursuant to subdivision (d) of Section 303 of the Clean Water Act (33 U.S.C. Sec. 1313(d)).

(3) Requirements authorizing a qualified local agency to implement those requirements adopted under this chapter within its jurisdiction if that local agency requests that authorization.

(4) Requirements for corrective action when onsite sewage treatment systems fail to meet the requirements or standards.

(5) Minimum requirements for monitoring used to determine system or systems performance, if applicable.

(6) Exemption criteria to be established by regional boards.

(7) Requirements for determining a system that is subject to a major repair, as provided in paragraph (2) of subdivision (a).

(c) This chapter does not diminish or otherwise affect the authority of a local agency to carry out laws, other than this chapter, that relate to onsite sewage treatment systems.

(d) This chapter does not preempt any regional board or local agency from adopting or retaining standards for onsite sewage treatment systems that are more protective of the public health or the environment than this chapter.

(e) Each regional board shall incorporate the regulations or standards adopted pursuant to subdivisions (a) and (b) into the appropriate regional water quality control plans.

13291.5 It is the intent of the Legislature to assist private property owners with existing systems who incur costs as a result of the implementation of the regulations established under this section by encouraging the state board to make loans under Chapter 6.5 (commencing with Section 13475) to local agencies to assist private property owners whose cost of compliance with these regulations exceeds one-half of one percent of the current assessed value of the property on which the onsite sewage system is located.

13291.7. Nothing in this chapter shall be construed to limit the land use authority of any city, county, or city and county.

Appendix II – State Regulations