Texas On-Site Wastewater Treatment Research Council

OSSF Training Center Performance Evaluation Study

August 31, 2006

FINAL REPORT

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August 31, 2006

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Subject: **OSSF Training Center Performance Evaluation**

Dear Council Members:

R. W. Beck, Inc. in association with Snowden On-Site and Amstar Engineering (The Project Team) is pleased to provide the Texas On-Site Wastewater Treatment Research Council (TOWTRC) with the "OSSF Training Center Performance Evaluation Study" Final Report.

The Project Team would like to express its appreciation to the many people who contributed to the development of this study. We appreciate the time and effort taken by these individuals to provide valuable information. The Project Team would also like to thank staff at TOWTRC who provided significant input, data and coordination efforts for the project.

Should you have any questions or comments regarding the study, please do not hesitate to contact Mr. Scott Pasternak or Ms. Katie Brown. Both can be reached at (512) 450-0991.

Sincerely,

R. W. Beck, Inc.

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Texas On-Site Wastewater Treatment Research Council
OSSD Training Center Performance Evaluation

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Section 1
EXECUTIVE SUMMARY

1.1 Background

The R. W. Beck Project Team (Project Team) was retained by the Texas Onsite Wastewater Treatment Research Council in July 2005 to perform a study that would "evaluate the effectiveness and the benefits of Council-funded projects to meet the Council's mission." With this objective in mind, the Project Team worked with the Council to develop a scope of work that would evaluate the performance of the State's three Council-funded On-Site Sewage Facility (OSSF) training centers.

1.2 Purpose

There are a total of three Council-funded training centers involved in this evaluation, each of which were established as educational mechanisms that serve as the primary resources for industry professionals seeking training and licensing in any of the following four OSSF professional designations developed by TCEQ:

- Installer I;
- Installer II;
- Site Evaluator; and
- Designated Representative.

This study was designed to evaluate the effectiveness and performance of the three Council-funded training centers in meeting the training needs of these OSSF professionals.

1.3 Methodology

In order to evaluate the effectiveness of the three Council-funded OSSF training centers, the R. W. Beck Project Team conducted telephone interviews with on-site wastewater treatment professionals from around the state who currently hold one or more of the following four licenses: Installer I, Installer II, Site Evaluator or Designated Representative. The primary objective of the interviews was to identify the participants' opinions of the various OSSF training programs and training centers based on their personal experiences. In addition, the interviews allowed the Project Team to gather valuable suggestions for future improvement of the various OSSF training courses and training centers.

The pool of potential interviewees was obtained from the list of licensed professionals publicly available on the TCEQ website. The Project Team conducted 130 interviews. The number of interviews for each program was determined as a percentage of total licensed professionals listed in the TCEQ database. The interviewees were randomly selected by geographic regions as defined by TCEQ. The objective of the interviews was to identify the participants' opinion of the training program and centers based on their experiences and also to gather suggestions for improvement. While the Project Team's budget limited the number of surveys completed, the Project Team concluded that additional surveys would not have provided significant variation in the responses provided.

The Project Team also conducted informal interviews with a number of OSSF training professionals from the Texas Engineering Extension Service (TEEX), Texas Onsite Wastewater Treatment Research Council (TOWTRC), and Texas Onsite Wastewater Association (TOWA) to obtain their thoughts regarding the feedback we received from the licensee interviews. These interviews were conducted to help the Project Team confirm or develop several of the key findings that are summarized in Section 1.4 and Section 8.

The Project Team would note that the methodology employed during the course of the project changed from the original Scope of Work. The original Scope of work planned to focus on evaluating the pass/fail rates from the training centers, as well as conducting a cost-benefit analysis. However, after an extensive effort by the Project Team to obtain needed information from multiple sources, it was concluded that this information was not available. Without access to this data, the Project Team requested a change in the Scope of Work. This request was sent via memo to the Council's project committee, and the committee chairperson approved the requested change in the Scope of Work. This report was developed based on the changed Scope of Work.

1.4 Overview of Major Findings

Throughout the course of this study, the Project Team sought to understand precisely how the three Council-funded OSSF training centers are currently being used to serve OSSF industry professionals seeking training and licensing, how effective the training centers have been in accomplishing their purpose, and how the utilization of these training centers might be improved in order to make more effective use of limited Council dollars. The following sections provide a brief summary of our overall findings and general recommendations for improving the effectiveness of the training centers.

1.4.1 Adapting Training Focus to Meet Current Demand

Interviews with a wide variety of licensed OSSF professionals and other persons with substantial knowledge of the three Council-funded training centers and the overall OSSF training system revealed an overall need to shift the focus of the training centers away form their initial purpose of licensing toward a greater focus on providing

continuing education for licensed professionals. This topic is discussed in greater detail throughout the report and specifically in Section 8.2 of this document.

1.4.2 Teach Real Skill Sets

Interviews conducted with licensees also revealed a need to shift the current training focus toward teaching real and practical skill sets and to increase the amount of hands-on learning that occurs at the training centers. The training centers have a wide variety of fixed facilities at their disposal that visually depict finished OSSF components and would serve as valuable teaching aides. However, the on-site systems available at the training centers are currently largely underutilized within the context of the OSSF licensing and continuing education courses. This topic is discussed in greater detail throughout the report and specifically in Section 8.3.1 of this document.

1.4.3 Update Course Content and Develop New CEU Topics and Formats

This study indicates a decreasing use of all three Council-funded training centers while OSSF professionals express an increasing need for continuing education options. OSSF professionals must complete at least 16 hours of continuing education each year in order to maintain their license, and they expressed a serious need for new courses and new content that will provide true continuing education options for licensees. The current lack of high-quality continuing education options at the training centers appears to be one of the primary contributors to the underutilization of these facilities. This topic is discussed in greater detail throughout the report and specifically in Section 8.3.2 of this document.

1.4.4 Improve Convenience and Communication Related to Training

The results of interviews conducted by the Project Team also indicate that there is an overall need to improve convenience and communication related to training. Some examples of common licensee recommendations on this topic included the need for improvements to the licensing information and notification system and the potential benefits of using a traveling mobile training unit to improve the accessibility of continuing education courses. Additional recommendations related to this topic are discussed in greater detail throughout the report and specifically in Section 8.3.3 of this document.

1.4.5 Understand the Audience and Tailor Courses to Their Needs

Finally, the licensed OSSF professional interviewed by the Project Team expressed a variety of suggestions for tailoring each of the individual courses and formats more

specifically to the goals and objectives of the course and trainee. This topic is discussed in greater detail throughout the report and specifically in Section 8.3.4 of this document.

Section 2
TRAINING CENTER EVALUATIONS

2.1 General Description

The R. W. Beck Project Team was retained to perform a study that would "evaluate the effectiveness and the benefits of Council-funded projects to meet the Council's mission." With this objective in mind, the Project Team worked with the Council to develop a scope of work that would evaluate the performance of the State's three Council-funded On-Site Sewage Facility (OSSF) training centers.

The three training centers involved in this evaluation are located in Bryan (Central Texas), Weslaco (South Texas), and El Paso (Far West Texas). Each of the OSSF training centers were established as educational mechanisms to meet the training and licensing needs of on-site wastewater treatment professionals including: inspectors, installers, site evaluators and others involved in the on-site wastewater treatment industry within the state.

Courses offered at the training centers are developed in cooperation with TCEQ, which promulgates State rules establishing requirements for licensing of professionals within the OSSF industry. Under State law and TCEQ rules, "no individual shall install, construct, alter, extend or repair an OSSF unless the individual holds a valid installer license issued by TCEQ." In addition, individuals working as OSSF Designated Representatives within Texas are required to hold a Designated Representative (DR) license issued by TCEQ, and all site evaluations within the State must be performed by a licensed Site Evaluator or a Registered Professional Engineer. In implementing these rules, TCEQ issues four types of OSSF licenses:

- Installer I;
- Installer II;
- Site Evaluator; and
- Designated Representative.

The three Council-funded OSSF training centers were developed to serve as the primary resources for industry professionals seeking training and licensing in any of the four OSSF professional designations developed by TCEQ. The following section describes the methodology the Project Team used to evaluate the effectiveness and performance of the three training centers in meeting the training needs of OSSF professionals.

2.2 Methodology

In order to evaluate the effectiveness of the three Council-funded OSSF training centers, R. W. Beck conducted telephone interviews with 130 on-site wastewater treatment professionals from around the state who currently hold one or more of the following four licenses: Installer I, Installer II, Site Evaluator or Designated Representative. The primary objective of the interviews was to identify the participants' opinions of the various OSSF training programs and training centers based on their personal experiences. In addition, the interviews allowed the Project Team to gather valuable suggestions for future improvement of the various OSSF training courses and training centers.

The pool of potential interviewees for the telephone interviews was obtained from a list of licensed OSSF professionals that is publicly available on the TCEQ website. The number of interviewees selected from each of the four licensing categories was determined as a percentage of the total number of licensed professionals listed in the TCEQ database. For example, there are currently 1,169 licensed Installer I professionals listed in the database, representing 24 percent of the 4,844 total licensees across all categories. Therefore, for the purposes of this survey process, 24 percent of the 130 total interviewees were selected from the list of licensed Installer I professionals. The appropriate number of interviewees from the four licensing categories were then randomly selected from each of the sixteen different TCEQ-defined geographic regions[1] of the state based on the number of licensees registered in that region as a proportion of total licensees in the state. This selection process was used to ensure fair and adequate representation of opinions from licensees in all regions of state.[2]

The Project Team developed an interview/survey instrument designed specifically to identify participants' opinions and perceptions related to the effectiveness of the OSSF training centers and the training curriculum utilized in teaching the four training courses. Topics covered in the survey included, but were not limited to, the following:

- Year when training was completed;
- Training center location;
- Quality of training program and location;
- Difficulty level of exams;
- Suggestions for improvement; and
- Suggestions for continuous education efforts.

All interviews were conducted over the telephone and took an average of 12 minutes to complete each interview. For a complete copy of the survey instrument utilized in this study, please refer to Appendix A.

[1] TCEQ regions include: Amarillo, Lubbock, Abilene, Arlington, Tyler, El Paso, Midland, San Angelo, Waco, Beaumont, Austin, Houston, San Antonio, Corpus Christi, Harlingen and Laredo.
[2] For a detailed breakdown of the number of interviewees by license category and region, please see Appendix C.

The Project Team conducted, tabulated and analyzed the interview data by both course and training location. The following four sections of the report present the results of this survey process. Each section is dedicated specifically to the results and findings from one of the four OSSF licensing categories outlined above. Each section contains a summary of the survey results, major findings and associated recommendations related to the particular licensing category. The survey/interview results are presented in three major categories:

- Training center;
- Non-training center; and
- Aggregated Training center and non-training center.

Many of the interviewees the Project Team spoke with had taken the same training courses a number of different times in different training locations and with different instructors. Interviewees cited a variety of reasons for attending the same training courses multiple times including: to obtain training for their initial license and sit for the exam; to re-take a licensing exam that they failed to pass on a previous attempt; to obtain continuing education credits; or to become re-licensed following a lapse in their licensing with the state. In order to simplify the survey process and allow survey results to be easily compared across all participants, all interviewees were asked to provide feedback specifically related to the training they attended immediately prior to taking and passing the exam to receive their initial license.

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Section 3
INTERVIEWS AND FINDINGS – INSTALLER I

3.1 Overview

This section of the report outlines the results of interviews conducted with a random sample of licensed Installer I professionals. Data gathered from the TCEQ database of licensed OSSF professionals indicates that there are currently 1,169 licensed Installer I professionals in the state. To obtain an Installer I license, an applicant must submit an application for approval, pay the application fee, complete the Installer I training course and pass the Installer I exam. No prior experience in the field is necessary. Licensed Installer I professionals are only authorized to install standard OSSF systems (i.e. septic tanks, absorptive drainfields, unlined ET drainfields, leaching chambers, gravel-less pipe, and pumped effluent drainfields). For many industry professionals, obtaining an Installer I license is the first step they must take in order to become eligible to obtain additional licenses as an Installer II or Site Evaluator.

3.2 Survey Results

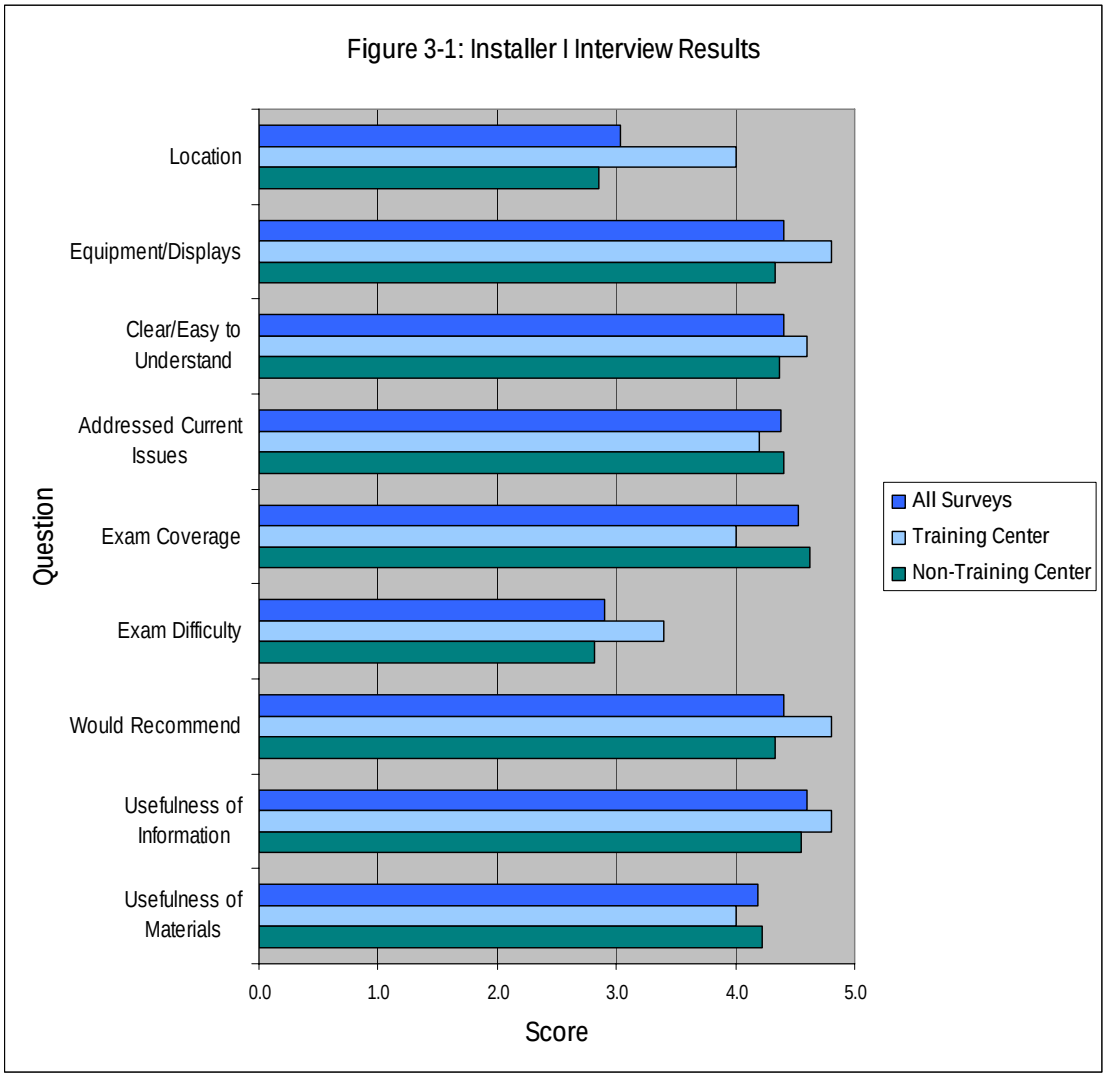
The Project Team surveyed a total of 32 on-site wastewater professionals who currently hold an Installer I license. All interviewees were randomly selected from the TCEQ database of licensed OSSF professionals. Licensed Installer I professionals from each of the 16 TCEQ regions were interviewed by the Project Team. Interviewees surveyed in this category attended training programs at various times and locations around the state between 1990 and 2005.

Of the 32 interviewees, only five (or sixteen percent) attended an Installer I training program held at one of the three Council-funded training centers. Four interviewees attended an Installer I training course held at the College Station training center and one interviewee attended training at the Weslaco training center. All other Installer I interviewees attended training courses held in other non-training center locations.

Table 3-1: Installer I Interviewees by Training Location

Training Location	Number	Percentage
Training Center:		
Bryan-College Station	4	13%
El Paso	0	-
Weslaco	1	3%
Non-Training Center	27	84%
Total	32	100%

The following chart summarizes a portion of the data collected from Installer I interviewees. For the following items, interviewees were asked to rate the training programs and locations that they attended on a variety of issues using a scale of one to five, with five corresponding with "strongly agree" and one corresponding with "strongly disagree". Separate scores are shown for both training completed at one of the three Council-funded training centers and training completed at a non-training center location, as well as an overall average of all scores combined. You may refer to a copy of the actual survey instrument located in Appendix A for the actual questions asked related to each issue displayed in Figure 3-1. A chart containing the actual numerical scores for each category can also be found in Appendix B.



Among the Installer I interviewees, those who attended training at one of the three Council-funded training centers reported that the location of the course was significantly more convenient on average than interviewees who attended training courses held at other non-training center locations. Interviewees who had attended one the three training centers also gave higher average marks than those who attended a non-training center location in the following areas:

- Having the necessary equipment, displays and demonstration areas to conduct the training effectively; and
- The likelihood that they would recommend the training program to others;
- The clarity and ease of understanding the information presented in the training course; and
- The overall usefulness of information presented in the training course.

However, despite the overall higher marks given to training center locations on these areas, interviewees who attended the Installer I training course at a training center

location perceived the licensing exam to be somewhat more difficult than those who attended a non-training center location. This observation may be closely related to the fact that interviewees who attended training at a non-training center location reported feeling on average that the topics covered in the licensing exam were more consistent with the information taught in the training program than did those attending training at one of the training centers.

In another portion of the interviews, participants were asked to rate the importance of five different factors in their decision to attend the Installer I training program. Interviewees ranked the following factors on a scale of one to five with five being "very important" and one being "not important":

- Training program cost;
- Travel distance;
- Program schedule; and
- Equipment, displays and demonstration areas available at the training site.

A summary of the ratings is provided in the following table.

Table 3-2: Installer I Decision Factor Ratings by Training Location Attended

Decision Factor	Training Center	Non-Training Center	All Surveys (Average)
Training Program Cost	3.6	3.0	3.1
Travel Distance	3.8	3.6	3.6
Program Schedule	4.0	3.6	3.7
Equipment, Displays & Demonstration Areas	4.6	3.3	3.5

Overall, the five factors appeared to be fairly equal in importance to interviewees in making decisions related to attending an Installer I training course. Program cost was generally the least important of the factors for interviewees with travel distance, schedule and equipment/displays available at a certain location playing a larger role in their decisions. One important observation is that the availability of equipment, displays and demonstration areas was reported to have played much more significant role in the decision-making of interviewees who attended the training at one of the three Council-funded training centers than it played in the decision-making of those who attended training at a non-training center location. Schedule and travel distance were the most important factors to interviewees attending non-training center locations.

Interviewees reported traveling distances ranging from only a few miles to as much as 750 miles to attend the Installer I training course. The average distance traveled by all survey participants was 226 miles. The average distance traveled by interviewees who

attended one of the training center locations was 145 miles, while the average distance traveled by those attending a non-training center location was 240 miles.[1]

When asked if they would consider taking any additional OSSF training courses at one of the training centers, the vast majority of interviewees indicated that they would. However, many stipulated that they would only do so if the training location was more convenient. When asked why they would consider attending additional training courses, the following responses were most commonly given:

- To gain additional knowledge and understanding in the field;
- The instructors are well qualified and informative;
- Would like to obtain training for additional licenses (i.e. Installer II and Site Evaluator);
- To fulfill continuing education requirements; and
- In order to attend a training center that has existing systems available for view and use as teaching aids.

Approximately 12 percent of Installer I licensees interviewed by the Project Team, stated that they would not consider taking additional training at any of the training center locations. The following reasons were given for their disinterest in additional training:

- Online training is now readily available and is much more economical and convenient.
- The training centers do not provide any true continuing education classes for licensed Installers. Currently, the only continuing education option for Installers who do not wish to obtain additional licenses is to take the same Installer I class multiple times.
- No longer in the OSSF installation business.

Throughout the course of each interview, participants were encouraged to provide feedback and recommendations that they believe would have a positive impact on the quality of the Installer I training course or location they attended. Interviewees were also asked to provide recommendations related to improving continuous education options for licensed OSSF professionals. Comments related to such improvements ranged widely, with some relating very specifically to the Installer I course and others pertaining to the broader OSSF training and licensing system as a whole. For the purposes of organizing this report, only those recommendations related specifically to improving the Installer I course are discussed in this section. Additional more general recommendations that relate to all four groups of licensees will be outlined and discussed separately in Section 7 of the report.

The following recommendations for improving Installer I courses represent the most commonly mentioned suggestions by licensees in this group:

[1] All mileage reflects one-way travel from the licensee's City of residence to the City in which they attended the training course.

- The course needs to be taught from the perspective of a novice.
- There is a need to focus more on the practical installation process rather than the theory behind systems.
- Course should include presentation of a variety of illustrations or case studies of systems that meet or do not meet specs along with explanations.
- Greater use of hands-on displays and demonstration areas would significantly improve the impact of the course.
- Inclusion of basic instruction on how to use equipment involved in installation would be helpful. (Possible alternative: Offer an additional short course on equipment for those who are new to the field.).
- There is a need to spend more adequate time covering the materials that will be most heavily tested on the licensing exam.

3.3 Summary of Findings

The following is a summary of the Project Team's major interview findings related to the three Council-funded training centers and their provision of Installer I training.

3.3.1 Attendance and Location

One of the most surprising findings of the interviews conducted by the Project Team was the low percentage of licensed Installer I professionals who attended training at one of the three Council-funded training center locations. Only sixteen percent of all Installer I professionals interviewed reported attending training at one of the three training centers.

This phenomenon appears to be largely a function of convenience, as those seeking Installer I training appear to have typically sought out the training location that offered the best overall combination of location and schedule for their needs. While each of the three training centers have been strategically placed in different regions of the state in efforts to better serve OSSF training needs in a variety of areas within the state, there is simply no way for just three training centers to serve as convenient training locations for the entire population of OSSF professionals within a state as large as Texas.

The lowest overall scores for both training center and non-training center locations were found on questions related to the convenience of the location. While the training centers received much higher average scores than non-training center locations on questions related to convenience of the training location, this is likely the result of the fact that the small percentage of licensees who attended a training center location traveled an average of nearly 100 miles less to reach the training location than did those who attended training at a non-training center location.

Therefore, with respect to Installer I training the three Council-funded training centers appear to be utilized primarily by the small percentage of the OSSF professional population for whom the locations are relatively convenient, while others for whom

the training center locations are not as convenient elect to attend training at other non-training center locations that are more convenient to their home and place of work.

3.3.2 Course Content

Several course content recommendations were repeatedly mentioned throughout the course of our interviews with licensed Installer I professionals. Among these, was the need to ensure that the Installer I training course is taught from the perspective of a novice. While a certain percentage of attendees in this course may have substantial OSSF installation knowledge and/or experience (i.e. those attending in order to renew an expired license, receive continuing education credit, etc.), the course has no prerequisites and serves as the introductory course for those entering the profession and therefore needs to be geared towards those without industry knowledge and experience.

A second theme repeated by interviewees was the need to focus more on the practical installation process rather than the theory behind OSSF systems. One interviewee suggested that a way to accomplish this task could be to use a variety of illustrations or case studies of actual systems that either met or did not meet specs along with explanations and illustrations that explain why the system was installed properly or improperly.

In keeping with the idea that the Installer I course is first and foremost an introductory course, a number of licensees suggested that the course include some basic instruction related to proper use of equipment involved in the installation process. Realizing that it may be difficult to incorporate this additional topic into an already content-rich course, a number of licensees recommended the possible alternative of offering an additional short course on equipment for those who are new to the field.

3.3.3 Displays and Demonstration Areas

Greater use of hands-on displays and demonstration areas would significantly improve the impact of the Installer I course. Many interviewees commented that they tend to learn much more easily by actually seeing and doing, rather than by reading about the methodology or theory behind something in a textbook or hearing about it in a lecture format. While it is understandable that some of the material must be covered in a traditional classroom lecture or textbook format, it would be very beneficial to develop some additional hands-on training exercises that directly teach and reinforce the material that is tested on the Installer I licensing exam. Interviewees generally reported that any displays or demonstration areas available at the training centers are not currently being used in a way that is truly integrated into the course format. Rather, they are used more as a supplemental afterthought to the main content of the course.

3.3.4 Exam Difficulty and Coverage

Interviewees who attended the Installer I training course at one of the three training center locations perceived the licensing exam to be somewhat more difficult than those who attended a non-training center location. On average, they also reported feeling that the topics covered in the licensing exam were less consistent with the information taught in the training program than did those interviewees that attended training at one of the non-training center locations. This indicates a need to spend more time covering the materials that will be most heavily tested on the licensing exam, and dedicating time to the various topics that must be covered in the training course in relative proportion to the extent in which they will be tested on the licensing exam.

Some of the data outlined previously in this section, suggested that while the three training centers were viewed by Installer I licensees as having superior access to the equipment, displays and demonstration areas necessary to conduct the training course effectively, interviewees also perceived the licensing exam to be more difficult on average at the training centers in large part due to the fact that there was a general feeling that there was less consistency between the materials taught in the class and the information tested on the exam.

Based on the information that the Project Team gathered through numerous interviews, it seems plausible that the reason for this discrepancy may have to do with the way in which the demonstration areas and other such teaching aids that are available at the training centers are currently being used. As mentioned in the previous subsection, interviewees reported that such hands-on teaching aids are not currently being utilized as an integral part of the course, but are instead introduced to the attendees as somewhat of an afterthought in the course. While these teaching aids have the potential to be very powerful tools if utilized in the right way, it appears that they may actually be functioning as a distraction from the main content of the course resulting in the perception by course attendees that they are not as prepared for the exam and that the exam questions do not relate as directly to the materials covered in the training course. This issue could be remedied by developing new ways to fully integrate the hands-on training assets that the training centers possess into the course format, using these resources to teach and reinforce key concepts and information that are tested on the licensing exam.

Section 4
INTERVIEWS AND FINDINGS – INSTALLER II

4.1 Overview

This section of the report outlines the results of interviews conducted with a random sample of licensed Installer II professionals. Data gathered from the TCEQ database of licensed OSSF professionals indicates that there are currently 1,949 licensed Installer II professionals in the state. To obtain an Installer II license, an applicant must have possessed an Installer I license for at least one year or an apprentice registration for at least two years, have performed a minimum of three to six installations (depending on their former license status), submit the appropriate application and fee, complete the Installer II training course and pass the Installer II exam. Licensed Installer II professionals are authorized to install all types of OSSF systems. Installer II licensees represent the largest group of licensed OSSF professionals in the state.

4.2 Survey Results

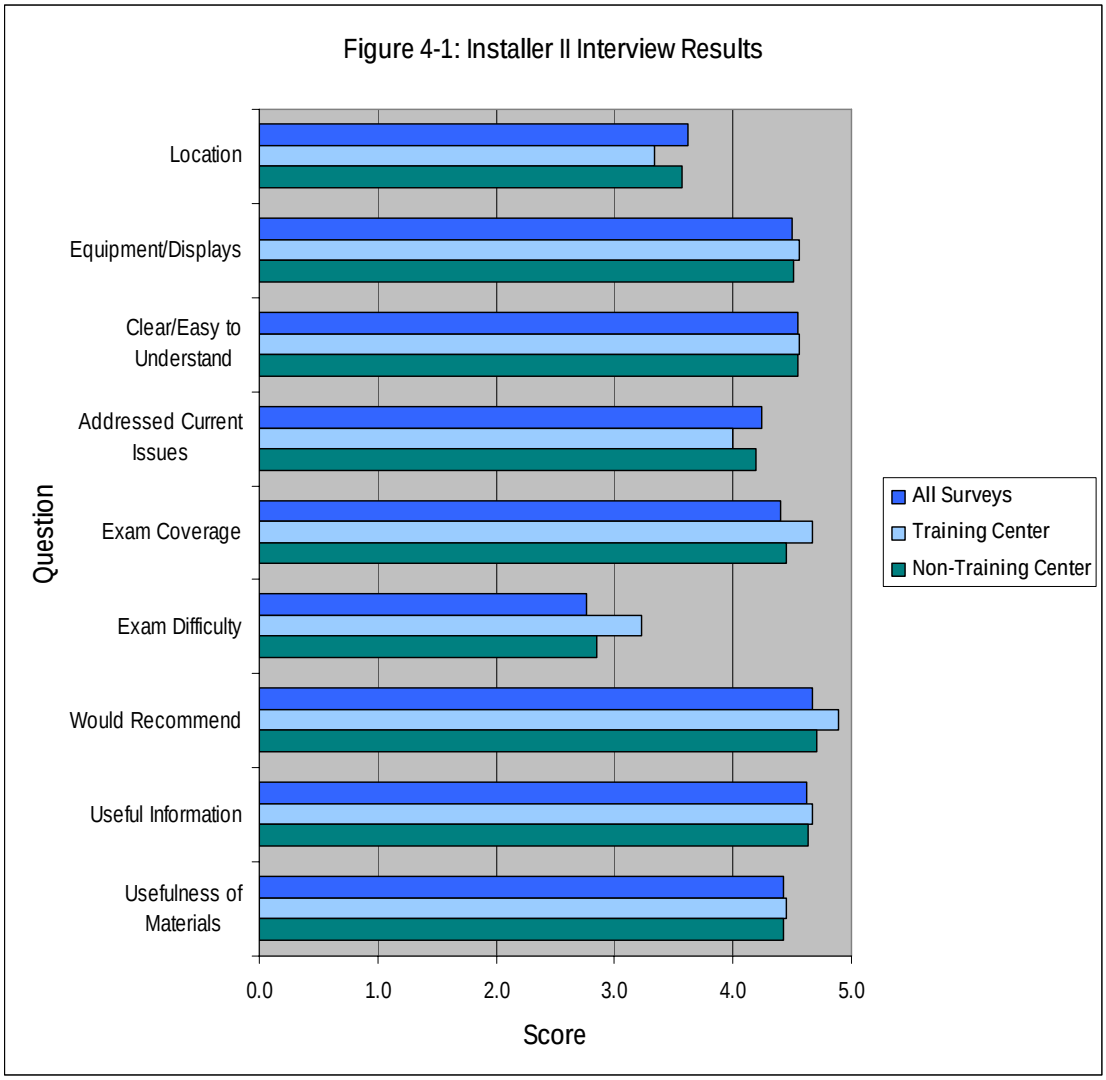
The Project Team surveyed a total of 51 on-site wastewater professionals who currently hold an Installer II license. All interviewees were randomly selected from the TCEQ database of licensed OSSF professionals. Licensed Installer II professionals from each of the 16 TCEQ regions were interviewed by the Project Team. Interviewees surveyed in this category attended training programs at various times and locations around the state between 1997 and 2005.

Of the 51 interviewees, only nine (or 18 percent) attended an Installer II training program held at one of the three Council-funded training centers. Eight interviewees attended an Installer II training course held at the College Station training center and one interviewee attended training at the El Paso training center. All other Installer II interviewees attended training courses held in other non-training center locations.

Table 4-1: Installer II Interviewees by Training Location

Training Location	Number	Percentage
Training Center:		
Bryan-College Station	8	16%
El Paso	1	2%
Weslaco	0	-
Non-Training Center	42	82%
Total	51	100%

The following chart summarizes a portion of the data collected from Installer II interviewees. For the following items, interviewees were asked to rate the training programs and locations that they attended on a variety of issues using a scale of one to five, with five corresponding with "strongly agree" and one corresponding with "strongly disagree". Separate scores are shown for both training completed at one of the three Council-funded training centers and training completed at a non-training center location, as well as an overall average of all scores combined. You may refer to a copy of the actual survey instrument located in Appendix A for the actual questions asked related to each issue displayed in Figure 4-1. A chart containing the actual numerical scores for each category can also be found in Appendix B.



The average ratings provided by Installer II interviewees were similar in many of the above categories for both those who attended training at one of the three Council-funded training centers and those who attended training at other non-training center locations. Ratings were very similar in the following categories:

- Availability of necessary equipment, displays and demonstration areas to conduct the training effectively;
- The clarity and ease of understanding the information presented in the training course; and
- The overall usefulness of information presented and materials used in the training course.

While average ratings among the two groups were quite similar in many regards, Installer II interviewees who attended training at one of the three Council-funded training centers reported a slightly greater likelihood that they would recommend the training program to others. In addition, interviewees who attended training at one of the training centers perceived the licensing exam to be more difficult than did

licensees who attended another non-training center location, however, they also felt that the exam coverage was tied more closely with the materials and topics covered in the training course.

Interviewees who attended a non-training center location for Installer II training gave slightly higher average marks than those who attended one of the three training centers in the following areas:

- Convenience of the training location; and
- Addressing current issues for OSSF installers.

In another portion of the interviews, participants were asked to rate the importance of five different factors in their decision to attend the Installer II training program. Interviewees ranked the following factors on a scale of one to five with five being "very important" and one being "not important":

- Training program cost;
- Travel distance;
- Program schedule; and
- Equipment, displays and demonstration areas available at the training site.

A summary of the ratings is provided in the following table.

Table 4-2: Installer II Decision Factor Ratings by Training Location Attended

Decision Factor	Training Center	Non-Training Center	All Surveys (Average)
Training Program Cost	3.8	3.1	3.3
Travel Distance	4.1	3.6	3.7
Program Schedule	3.2	3.8	3.7
Equipment, Displays & Demonstration Areas	3.8	3.4	3.5

On average, the four factors appeared to be fairly equal in importance to interviewees in making decisions related to attending an Installer II training course. However, in looking at the ratings broken down between those who attended one of the training centers and those who attended a non-training center location, there are several interesting differences. First, Installer II interviewees who attended training at a non-training center location rated program schedule as the most important factor for them in deciding to attend the training course. They also rated cost as the least important factor in their decision. In contrast, interviewees who attended Installer II training at one of the three Council-funded training centers rated schedule as the least important factor in their decision on average and cost as being a stronger determining factor in their decision than did those who attended training at a non-training center location.

Interviewees reported traveling distances ranging from only a few miles to as much as 693 miles to attend the Installer II training course. The average distance traveled by all survey participants was 174 miles. The average distance traveled by interviewees

who attended one of the training center locations was 263 miles, while the average distance traveled by those attending a non-training center location was 151 miles.[1]

When asked if they would consider taking any additional OSSF training courses at one of the training centers, the vast majority of interviewees indicated that they would. However, many stipulated that they would only do so if the training location was more convenient. When asked why they would consider attending additional training courses, the following responses were most commonly given:

- To gain additional training and knowledge in the field.
- The instructors are well qualified and informative.
- Would like to obtain training for additional licenses (i.e. Site Evaluator).
- To get updates on rule changes.
- To fulfill mandatory continuing education requirements.

Approximately ten percent of Installer II licensees interviewed by the Project Team stated that they would not consider taking additional training at any of the training center locations. The following reasons were given for their disinterest in such additional training:

- The training locations are too inconvenient.
- The cost of course registration and travel makes additional training cost prohibitive.
- The training centers do not provide any true continuing education classes for licensed Installers. The only continuing education option currently available is for installers to take the same courses multiple times.
- There is not significant demand for installation of OSSF systems in the area or only conventional systems are installed in the area.

Throughout the course of each interview, participants were encouraged to provide feedback and recommendations that they believe would have a positive impact on the quality of the Installer II training course or location they attended. Interviewees were also asked to provide recommendations related to improving continuous education options for licensed OSSF professionals. Comments related to such improvements ranged widely, with some relating very specifically to the Installer II course and yet others pertaining to the broader OSSF training and licensing system as a whole. For the purposes of organizing this report, only those recommendations related specifically to improving the Installer II course are discussed in this section. All other more general recommendations that relate to all four groups of licensees will be outlined and discussed separately in Section 7 of the report.

The following recommendations for improving Installer II courses represent the most commonly mentioned suggestions by licensees in this group:

[1] All mileage reflects one-way travel from the licensee's City of residence to the City in which they attended the training course.

- Include more instruction on aerobic systems, evapotranspiration (ET) systems and low pressure dosing.
- Training course should include more instruction related to system maintenance in addition to installation.
- Training course should be updated to include more cutting edge industry information related to new products and technologies available in the market or currently in testing.
- There is a need to focus more on the practical installation process rather than the theory behind systems.
- May want to consider making a soil analysis course mandatory for all Installer II licensees.
- The training course would provide greater value to attendees if it were geared specifically toward professionals in different regions of the state (i.e. East, West and Central).
- Extend the training course from three days to a total of four days with the last day being devoted solely to a short review session followed by the exam.
- It would be beneficial to offer two different levels of this course – an intermediate version for those with some experience in the field and an advanced version for those with significant knowledge and experience.
- Offer a greater number of courses in the Fall and Winter months when installers are generally not as busy.

4.3 Summary of Findings

The following is a summary of the Project Team's major interview findings related to the three Council-funded training centers and their provision of Installer II training.

4.3.1 Attendance and Location

As with the Installer I training, one of the most surprising findings of the interviews conducted by the Project Team was the low percentage of licensed Installer II professionals that attended training at one of the three Council-funded training center locations. Only 18 percent of all Installer II professionals interviewed reported attending training at one of the three training centers.

This phenomenon again appeared to be largely a function of convenience, with the non-training center locations catering more to those for whom convenience is the most important factor, and the training centers appearing to be geared more toward those who have a bit more flexibility in their schedule and are looking for more of a combination of convenience, value and availability of equipment, displays and demonstration areas that can be used to enhance the training experience.

4.3.2 Course Content and Format

Several course content recommendations were repeatedly mentioned throughout the interviews with licensed Installer II professionals. Among these recommendations was the need to focus more on the practical installation process rather than the theory behind OSSF systems. This sentiment was also widely expressed by Installer I licensees interviewed by the Project Team.

In addition, interviewees expressed a need to have Installer II training courses that are specifically geared toward OSSF professionals in specific regions of the State (i.e. East, West and Central). Many felt that such a change would provide greater value to attendees by allowing the training to focus more specifically on the types of systems that are most commonly installed in the specific region in which a group of licensees work. Under the current course format, installers learn about installation of a cross section of systems used around the state. However, because Texas encompasses so many diverse regions that require different types of systems and solutions, licensees reported that some portion of the training time is inevitably less productive because it covers information on installation of certain types of systems that some OSSF professionals in the state will never install or see in their area. Installer II licensees also recommended offering two different levels of the Installer II course – an intermediate version for those with some experience in the field and an advanced version for those with significant knowledge and experience.

Other common recommendations included the need to include more instruction related to aerobic systems, evapotranspiration (ET) systems, low-pressure dosing and system maintenance in the Installer II training course. Interviewees also thought it would be helpful if the training program included an update on more cutting edge industry information such as new products and technologies available in the market.

4.3.3 Displays and Demonstration Areas

The majority of Installer II licensees interviewed by the Project Team felt that equipment, displays and demonstration areas were generally much less important in the Installer II course than they were for the Installer I course. This is due in large part to the fact that eligibility to attend the Installer II training requires both experience and a previous installer license. Because of their prior experience, OSSF professionals attending an Installer II courses generally have a much better grasp on the basics of OSSF systems than those attending Installer I courses, thus allowing them to grasp concepts related to more advanced systems without the aid of more visual or hands-on teaching aids.

The fact that such displays and demonstration areas are seen as significantly less important to the Installer II course means that the three Council-funded training centers have no real added value or benefit to attendees of this course beyond what the various non-training center locations can provide. This makes it more likely that OSSF professionals seeking Installer II training will simply seek out the training location that is most convenient in terms of location and schedule. This factor may also help explain the close similarity in ratings reported across a broad spectrum of

measures by both those who attended training at one of the training center locations and those who attended training at another non-training center location within the state.

Section 5
INTERVIEWS AND FINDINGS – SITE EVALUATOR

5.1 Overview

This section of the report outlines the results of interviews conducted with a random sample of OSSF professionals who hold a current Site Evaluator license. Data gathered from the TCEQ database of licensed OSSF professionals indicates that there are currently 947 licensed Site Evaluators in the state. To be eligible to obtain a Site Evaluator license, an applicant must possess a current Installer II or Designated Representative license or be a registered Professional Engineer, Sanitarian or Geoscientist. They must also submit an application and application fee, complete the Site Evaluator training course and pass the Site Evaluator exam. No prior site evaluation experience is required. Licensed Site Evaluators are authorized to perform preconstruction site evaluations to determine a site's suitability for a particular OSSF system and to identify all features in the area where an OSSF is to be installed that could be contaminated by the OSSF or could prevent the proper operation of the system.

5.2 Survey Results

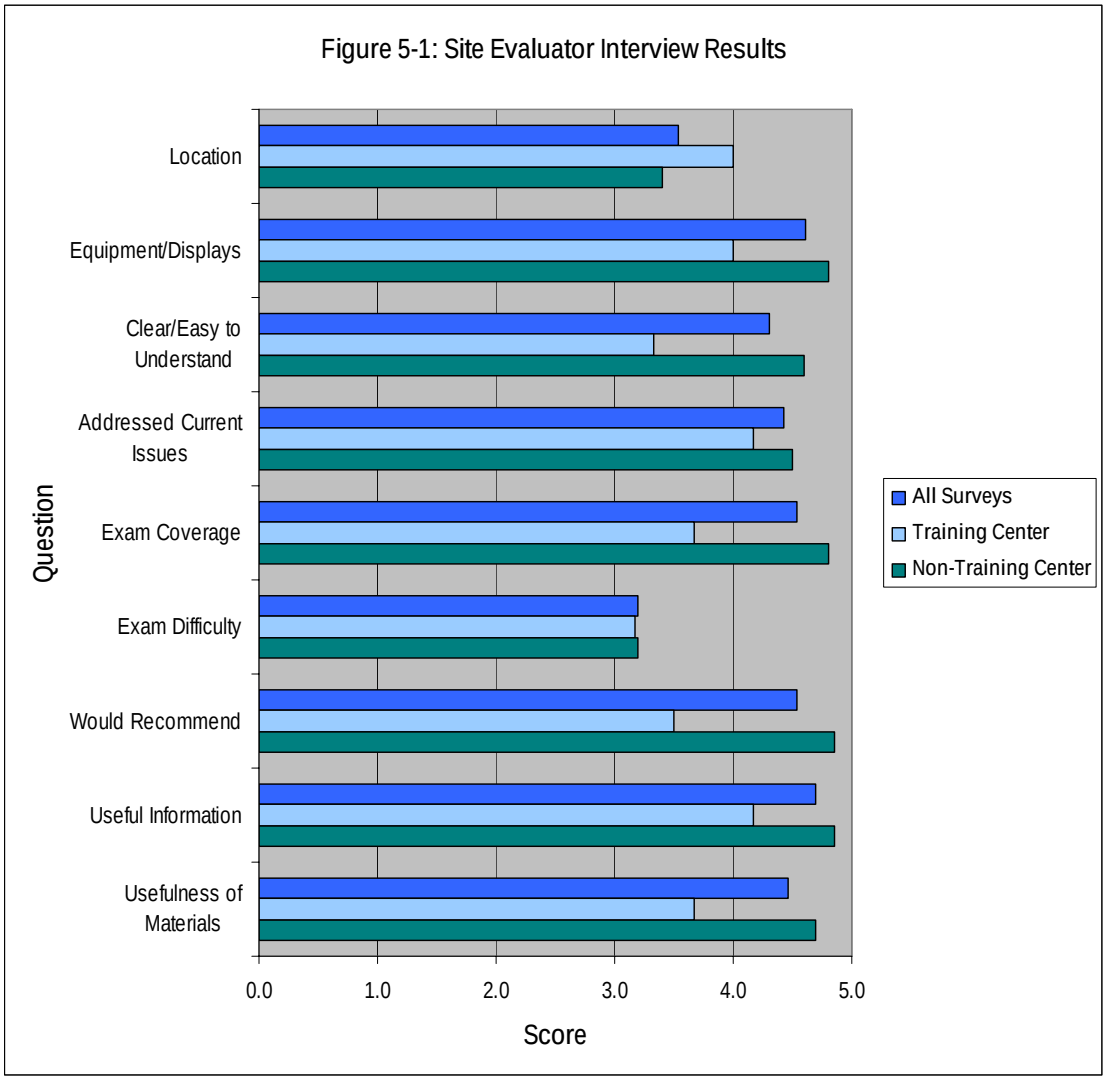
The Project Team surveyed a total of 26 on-site wastewater professionals who currently hold a Site Evaluator license. All interviewees were randomly selected from the TCEQ database of licensed OSSF professionals. Licensed Site Evaluator professionals from each of the 16 TCEQ regions were interviewed by the Project Team. Interviewees surveyed in this category attended training programs at various times and locations around the state between 2002 and 2005.

Of the 26 interviewees, only six (or 23 percent) attended a Site Evaluator training program held at one of the three Council-funded training centers. All six of those interviewees attended the Site Evaluator training course held at the College Station training center. All other Site Evaluator interviewees attended training courses held in other non-training center locations.

Table 5-1: Site Evaluator Interviewees by Training Location

Training Location	Number	Percentage
Training Center:		
Bryan-College Station	6	23%
El Paso	0	-
Weslaco	0	-
Non-Training Center	20	77%
Total	26	100%

The following chart summarizes a portion of the data collected from Site Evaluator interviewees. For the following items, interviewees were asked to rate the training programs and locations that they attended on a variety of issues using a scale of one to five, with five corresponding with "strongly agree" and one corresponding with "strongly disagree". Separate scores are shown for both training completed at one of the three Council-funded training centers and training completed at a non-training center location, as well as an overall average of all scores combined. You may refer to a copy of the actual survey instrument located in Appendix A for the actual questions asked related to each issue displayed in Figure 5-1. A chart containing the actual numerical scores for each category can also be found in Appendix B.



Site Evaluator interviewees who attended training courses at non-training center locations reported higher average marks than interviewees who attended one of the three Council-funded training centers in nearly every category related to the quality of training and training facilities. Non-training center locations received significantly higher average ratings than the training centers in each of the following areas:

- Having the necessary equipment, displays and demonstration areas to conduct the training effectively;
- Clarity and ease of understanding the information presented in the training course;
- Addressing current issues in OSSF related fields;
- Licensing exam coverage was consistent with the information taught training program;
- Likelihood that they would recommend the training program to others; and
- Overall usefulness of information presented and materials used to teach the training course.

Location convenience was the only category in which interviewees who had attended Site Evaluator training at one of the training centers gave higher average ratings than did those who attended training held at a non-training center location.

Interviewees reported traveling distances ranging from only a few miles to as much as 531 miles to attend the Site Evaluator training course. The average distance traveled by all survey participants was 188 miles. The average distance traveled by interviewees who attended one of the training center locations was 159 miles, while the average distance traveled by those attending a non-training center location was 197 miles.[1]

In another portion of the interviews, participants were asked to rate the importance of five different factors in their decision to attend the Site Evaluator training program. Interviewees ranked the following factors on a scale of one to five with five being "very important" and one being "not important":

- Training program cost;
- Travel distance;
- Program schedule; and
- Equipment, displays and demonstration areas available at the training site.

A summary of the ratings is provided in the following table.

Table 5-2: Site Evaluator Decision Factor Ratings by Training Location Attended

Decision Factor	Training Center	Non-Training Center	All Surveys (Average)
Training Program Cost	2.5	2.9	2.8
Travel Distance	3.2	3.4	3.3
Program Schedule	3.0	3.3	3.2
Equipment, Displays & Demonstration Areas	3.7	3.8	3.7

Of the four factors, the availability of equipment, displays and demonstration areas was on average ranked the most important factor related to decisions to attend the Site Evaluator training course by interviewees regardless of whether they attended training at a Council-funded training center or at another non-training center location. Similarly, cost was the least important factor on average across both groups of licensees.

When asked if they would consider taking any additional OSSF training courses at one of the training centers, the vast majority of interviewees indicated that they would. However, many stipulated that they would only do so if the training location was more convenient. When asked why they would consider attending additional training courses, the following responses were most commonly given:

[1] All mileage reflects one-way travel from the licensee's City of residence to the City in which they attended the training course.

- To gain additional knowledge and understanding in the field.
- The courses are generally very good and instructors are well qualified.
- To fulfill mandatory continuing education requirements.

Approximately eight percent of Site Evaluator licensees interviewed by the Project Team stated that they would not consider taking additional training at any of the training center locations. The following reasons were given for their disinterest in such additional training:

- The cost of course registration and travel makes additional training cost prohibitive.

Throughout the course of each interview, participants were encouraged to provide feedback and recommendations that they believe would have a positive impact on the quality of the Site Evaluator training course or location they attended. Interviewees were also asked to provide recommendations related to improving continuous education options for licensed OSSF professionals. Comments related to such improvements ranged widely, with some relating very specifically to the Site Evaluator course and yet others pertaining to the broader OSSF training and licensing system as a whole. For the purposes of organizing this report, only those recommendations related specifically to improving the Site Evaluator course will be discussed in this section. All other more general recommendations that relate to all four groups of licensees will be outlined and discussed separately in Section 7 of the report.

The following recommendations for improving Site Evaluator courses represent the most commonly mentioned suggestions by licensees in this group:

- Course needs to incorporate a wider variety of soils from around the state.
- Introduction of all equipment and tools that a Site Evaluator will need to perform their job (i.e. laser light transit, GSM, etc.) should be included in the training course.
- The course training manual needs improvement (i.e. updated information, better organization, and addition of an index that allows the manual to be used as a quick reference).
- Instruction on proper placement of the system on the site should be included a part of the course.

5.3 Summary of Findings

The following is a summary of the Project Team's major interview findings related to the three Council-funded training centers and their provision of Site Evaluator training.

5.3.1 Attendance and Location

As with Installer I and Installer II training, the percentage of licensed Site Evaluators that attended training at one of the three Council-funded training center locations was very low. Only 23 percent of all Site Evaluator professionals interviewed reported attending training at one of the three training centers.

Licensees who attended the training course at one of the three Council-funded training centers gave a better average rating for the convenience of the training location than did interviewees who attended training at another non-training center location. Another interesting observation is that both groups of Site Evaluator licensees reported traveling an average distance to the training location that was substantially less than the average travel distance recorded for Installer I and Installer II licensees.

5.3.2 Course Content and Format

Several course content recommendations were repeatedly mentioned throughout the interviews with licensed Site Evaluators. Among these recommendations were the following:

- The need to incorporate a wider variety of soils from around the state in the in-class soil analysis exercises.
- Recommendation that all equipment and tools that must be utilized by a Site Evaluator in performance of their job (i.e. laser light transit, GPS, etc.) be included in the training course.
- Instruction on proper placement of the system on the site should be included a part of the course.

5.3.3 Displays and Demonstration Areas

The majority of Site Evaluator licensees interviewed by the Project Team felt that equipment, displays and demonstration areas were generally very important in the Site Evaluator training course. The fact that such displays and demonstration areas are seen as being quite important to the Site Evaluator course should give the three Council-funded training centers some added value to offer attendees of this course beyond what the various non-training center locations can provide. However, the training centers were rated lower by interviewees in nearly all evaluation categories than were the non-training center locations on average. This indicates that the training centers are simply not making full and wise use of the training assets they possess.

Section 6
INTERVIEWS AND FINDINGS – DESIGNATED REPRESENTATIVE

6.1 Overview

This section of the report outlines the results of interviews conducted with a random sample of OSSF professionals who hold a current Designated Representative license. Data gathered from the TCEQ database of licensed OSSF professionals indicates that there are currently 779 licensed Designated Representatives in the state. To obtain a Designated Representative license, an applicant must submit an application for approval, pay the application fee, complete the Designated Representative training course and pass the exam. No prior experience in the field is necessary. Designated Representatives work for an authorized agent of the TCEQ. They perform site evaluations (when it is part of their job duties), complaint investigations, system evaluations, and inspections of OSSFs that have been issued an authorization to construct, to ensure the OSSF meets the proper criteria. Designated Representative licensees represent the smallest group of licensed OSSF professionals in the state.

6.2 Survey Results

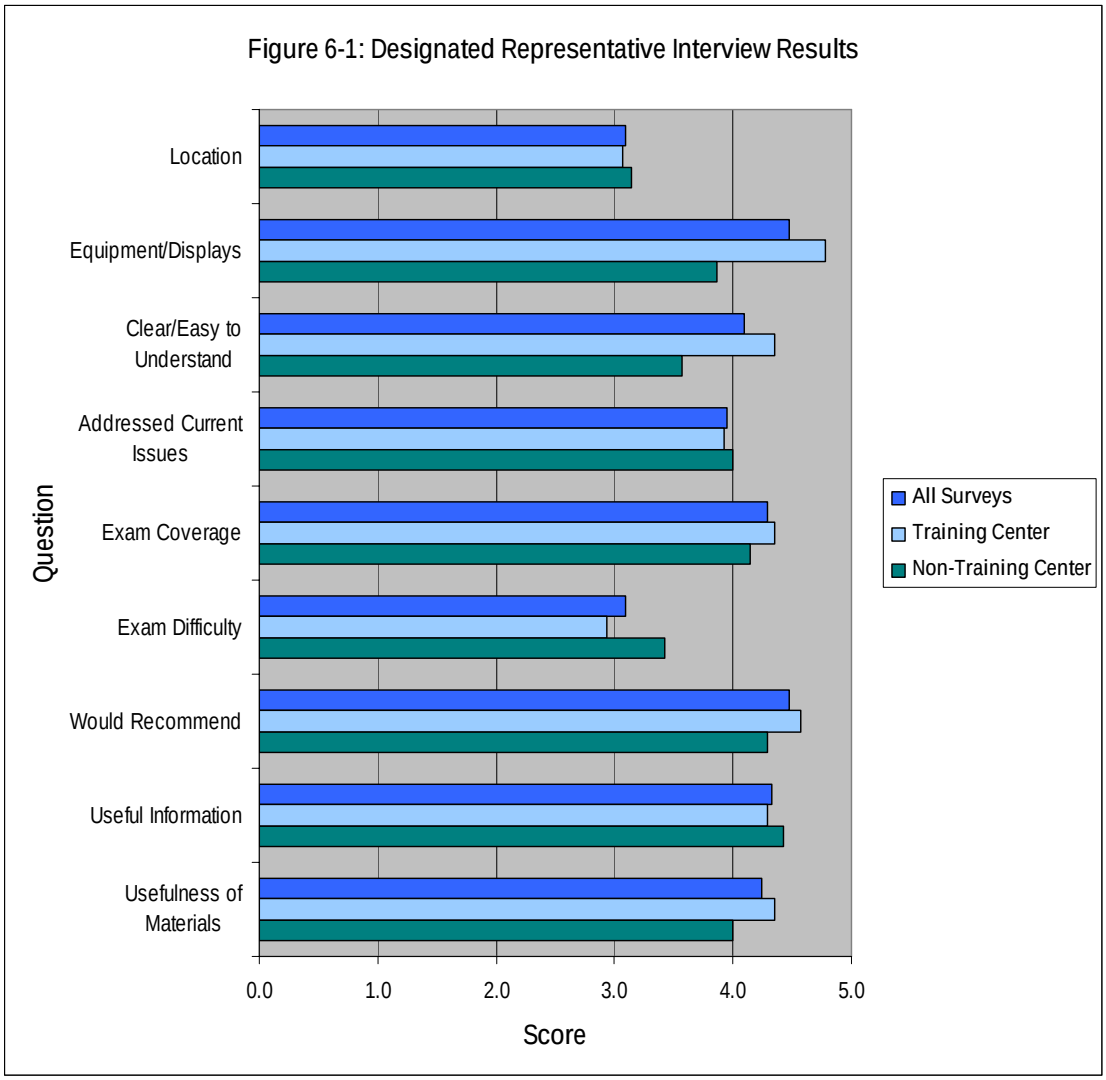
The Project Team surveyed a total of 21 on-site wastewater professionals who currently hold a Designated Representative license. All interviewees were randomly selected from the TCEQ database of licensed OSSF professionals. Licensed Designated Representatives from each of the 16 TCEQ regions were interviewed by the Project Team. Interviewees surveyed in this category attended training programs at various times and locations around the state between 2001 and 2005.

Of the 21 interviewees, a total of 14 (or 67 percent) attended a Designated Representative training program held at one of the three Council-funded training centers. Nine interviewees attended a Designated Representative training course held at the College Station training center and five interviewees attended training at the Weslaco training center. All other Designated Representative interviewees attended training courses held in other non-training center locations.

Table 6-1: Designated Representative Interviewees by Training Location

Training Location	Number	Percentage
Training Center:		
Bryan-College Station	9	43%
El Paso	0	-
Weslaco	5	24%
Non-Training Center	7	33%
Total	21	100%

The following chart summarizes a portion of the data collected from Designated Representative interviewees. For the following items, interviewees were asked to rate the training programs and locations that they attended on a variety of issues using a scale of one to five, with five corresponding with "strongly agree" and one corresponding with "strongly disagree". Separate scores are shown for both training completed at one of the three Council-funded training centers and training completed at a non-training center location, as well as an overall average of all scores combined. You may refer to a copy of the actual survey instrument located in Appendix A for the actual questions asked related to each issue displayed in Figure 6-1. A chart containing the actual numerical scores for each category can also be found in Appendix B.



The average ratings provided by Designated Representative interviewees were similar in many of the above categories for both those who attended training at one of the three Council-funded training centers and those who attended training at other non-training center locations. Ratings were very similar in the following categories:

- Convenience of the training location;
- The overall usefulness of information presented and materials used in the training course;
- Addressing current issues in OSSF related field;
- Licensing exam coverage was consistent with the information taught training program; and
- Likelihood that they would recommend the training program to others.

While average ratings among the two groups were quite similar in many regards, Designated Representative interviewees who attended training at one of the three

Council-funded training centers reported that the training materials and instruction were on average significantly clearer and easier to understand than did those who attended Designated Representative training at one of the non-training center locations. In addition, interviewees who attended training at the training centers rated their access to the necessary equipment, displays and demonstration areas as better on average than those who attended other non-training center locations.

In another portion of the interviews, participants were asked to rate the importance of four different factors in their decision to attend the Designated Representative training program. Interviewees ranked the following factors on a scale of one to five with five being "very important" and one being "not important":

- Training program cost;
- Travel distance;
- Program schedule; and
- Equipment, displays and demonstration areas available at the training site.

A summary of the ratings is provided in the following table.

Table 6-2: Designated Representative Decision Factor Ratings by Training Location Attended

Decision Factor	Training Center	Non-Training Center	All Surveys (Average)
Training Program Cost	1.9	2.0	2.0
Travel Distance	2.0	3.0	2.3
Program Schedule	2.8	3.4	3.0
Equipment, Displays & Demonstration Areas	3.9	2.7	3.5

Overall, Designated Representative licensees rated program schedule and the availability of necessary equipment, displays and demonstration areas as the most important factors related to their decisions to attending a Designated Representative training course. Program cost was the least important of the factors for interviewees. This is not surprising, since the Designated Representative licensees work for TCEQ authorized agencies and therefore, their training and associated travel costs are paid for by the state or local agency for which they work.

The majority of licensees who rated the availability of necessary equipment, displays and demonstration areas as the most important factor in their decision to attend a Designated Representative training course elected to attend the training at one of the three Council-funded training centers. Alternatively, those licensees who rated program schedule as the most important factor in their decision to attend a Designated Representative training course primarily elected to attend the training course at a non-training center location.

Interviewees reported traveling distances ranging from as little as 17 miles to as much as 600 miles to attend the Designated Representative training course. The average distance traveled by all survey participants was 241 miles. The average distance

traveled by interviewees who attended one of the training center locations was 259 miles, while the average distance traveled by those attending a non-training center location was 203 miles.[1]

When asked if they would consider taking any additional OSSF training courses at one of the training centers, the vast majority of interviewees indicated that they would. However, many stipulated that they would only do so if the training location was more convenient. When asked why they would consider attending additional training courses, the following responses were most commonly given:

- To gain additional knowledge and understanding in the field;
- The class was valuable and informative;
- Would like to obtain training for additional licenses (i.e. Site Evaluator); and
- To fulfill continuing mandatory education requirements and job-related requirements.

None of the Designated Representative licensees interviewed by the Project Team stated that they would not consider taking additional training at any of the training center locations.

Throughout the course of each interview, participants were encouraged to provide feedback and recommendations that they believe would have a positive impact on the quality of the Designated Representative training course or location they attended. Interviewees were also asked to provide recommendations related to improving continuous education options for licensed OSSF professionals. Comments related to such improvements ranged widely, with some relating very specifically to the Designated Representative course and yet others pertaining to the broader OSSF training and licensing system as a whole. For the purposes of organizing this report, only those recommendations related specifically to improving the Designated Representative course will be discussed in this section. All other more general recommendations that relate to all four groups of licensees will be outlined and discussed separately in Section 7 of the report.

The following recommendations for improving Designated Representative courses were the most commonly mentioned suggestions by licensees in this group:

- It would be very beneficial for course instruction to include more hands-on training, displays or demonstrations.
- The course should cover the proper use of a transit.
- Class instruction should include a chapter on forms, documents and maintenance contracts that must be used by a Designated Representative;
- Include more instruction related to aerobic systems and soil classification in the training course;

[1] All mileage reflects one-way travel from the licensee's City of residence to the City in which they attended the training course.

- Address how a Designated Representative should deal with environmental health complaints;
- The course should include instruction on the specific procedures a Designated Representative should follow during field inspection;
- It would be helpful to provide attendees with a list of resources and contacts to consult when they encounter new questions or issues following the course;
- Those attending Designated Representative training could benefit substantially from the course being a day or two longer in order to properly cover all critical material and prepare trainees to perform their job properly; and
- Could consider offering this training course as two separate courses (i.e. an introductory DR course and an advanced DR course).

6.3 Summary of Findings

The following is a summary of the Project Team's major interview findings related to the three Council-funded training centers and their provision of Designated Representative training.

6.3.1 Attendance and Location

The percentage of licensed Designated Representatives who attended training at one of the three Council-funded training center locations was much higher than for any of the other OSSF training courses. Sixty-seven percent of all Designated Representative professionals interviewed reported attending training at one of the three training centers. While the Designated Representative group posted the longest average travel times among all licensing groups to their respective training locations, they tended to care more about attending training at a location with good resources than they did about cost or travel distance. As mentioned previously, this observation is quite understandable based on the fact that Designated Representative training is paid for by the local or state TCEQ authorized agency that employs the person.

6.3.2 Course Content and Format

Several course content recommendations were repeatedly mentioned throughout the interviews with licensed Designated Representatives. Among these recommendations was the need to gear the course toward those who are novices in the OSSF industry. Most of the licensees interviewed by the Project Team had little or no experience in the OSSF field when they attended the Designated Representative training course.

Due to the fact that most novice Designated Representative applicants know very little about the OSSF industry, it may be very beneficial to consider some of the following changes to the training format and schedule:

- Those attending Designated Representative training could benefit substantially from the course being a day or two longer in order to properly cover all critical material and prepare trainees to perform their job properly.

- Consider offering this single training course as two separate courses (i.e. an introductory DR course and an advanced DR course).

Designated Representatives act as the primary resource to the community and to their local OSSF professionals, making it extremely important to ensure that licensees gain at least a firm grasp on basic OSSF principles and ideas during the training course. Ideally, the DR's should possess equal or superior competency to the other industry practitioners since they are the approval authority for plan reviews, construction and site inspections, and complaint investigators. Adding an additional day to the course and/or offering the course at two different levels seems to be the most obvious solution for bringing these individuals up to a sufficient level of understanding on the subject matter. It would be helpful for the training centers to provide licensees with a list of resources and contacts to consult when they encounter new questions or issues following the training course.

Other important course content recommendations included:

- Additional or improved coverage on topics such as aerobic systems, soil classification and the proper use of a transit;
- Instruction related to the various forms, documents and maintenance contracts that Designated Representatives must utilize and complete as part of their positions;
- Training related to how a Designated Representative should deal with environmental health complaints; and
- Instruction on the specific procedures a Designated Representative should follow during field inspections.

6.3.3 Displays and Demonstration Areas

The majority of Designated Representative licensees interviewed by the Project Team felt that equipment, displays and demonstration areas were generally very important in the Designated Representative training course. The fact that such displays and demonstration areas are seen as being quite important to this course allows the three Council-funded training centers to provide some added value to attendees of this course beyond what the various non-training center locations can provide. The fact that 67 percent of the Designated Representative licensees interviewed by the Project Team had attended the training course at one of the three Council-funded training centers, indicates that the training centers are doing a fairly good job in utilizing these assets in relation to Designated Representative course.

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Section 7
INTERVIEWS AND FINDINGS – ADDITIONAL ANALYSIS

7.1 Overview

Throughout the course of conducting interviews with OSSF professionals from each of the four licensing groups, the Project Team received large amounts of feedback and recommendations from interview participants related to training format and content, training locations and the quality and availability of training for continuing education. This section of the report focuses on recommendations provided by various OSSF licensees that do not pertain specifically to just one of the licensing categories, but are more appropriately discussed in the general context the broader OSSF training and licensing system as a whole.

7.2 General Course Content Improvements

During the course of each interview, OSSF licensees were encouraged to provide feedback and recommendations that they believed would have a positive impact on the quality of the training courses, training locations, or the current continuing education system. The following recommendations come directly from the Project Team's extensive discussions with a wide variety of OSSF licensees from diverse backgrounds and locations within the state and deal specifically with recommendations for updating and improving overall course content across all OSSF training courses.

- Continuing education options could be improved by including new and up-to-date information on current rules and regulations in each of the courses. In addition, an explanation of the reasons behind the rules and a discussion of possible upcoming rules changes or new legislation related to the field would be helpful to all licensed OSSF professionals.
- Training courses should attempt to better address new materials and technology available on the market.
- There is a general need for more classroom instruction related to aerobic system installation, maintenance and repair, leaching chambers, soil analysis and wetland systems.
- Additional course content related to troubleshooting various types of systems would be of significant benefit to both first-time licensees and those with more experience in the field.

- The development of a quick reference comparison chart that outlines the major characteristics of the most commonly used systems in the state would be very valuable to OSSF licensees as a reference that is currently not easily available.
- Some licensees felt that safety measures and precautions related to system installation should be discussed as part of the Installer I and Installer II training programs.
- Many OSSF training course attendees (particularly those in the Installer I and Designated Representative classes) are very new to the industry and do not know where to purchase the variety of tools utilized and discussed within the class setting. It would be useful to have a small packet of such information available to attendees that lists where they can acquire the basic equipment they need to perform their job correctly.
- Numerous interviewees commented that the exam question style and wording for all of the licensing exams need improvement. Licensees commonly reported feeling that the exams contained too many "trick questions" and recommended that the exams be developed to test potential licensees on the most important topics and concepts in a more straightforward manner.
- The only training courses currently offered for installers are the Installer I training course and the Installer II course. Several more advanced/experienced installers suggested the development of a new, more advanced Installer course related to installation of larger/commercial systems.

7.3 General Course Format Improvements

The following recommendations come directly from the Project Team's extensive interviews with a diverse group of OSSF licensees and deal specifically with recommendations for updating and improving the course formats used across all OSSF training courses.

- Many licensees recommended reducing the amount of training time devoted to traditional lecture format and increasing the amount of time spent in hands-on learning activities. This would require that hands-on activities are carefully developed in a way that allows critical course content to be easily conveyed through such hands-on activities. This recommendation is especially applicable to the Installer I course and the Designated Representative course.
- Another common recommendation dealt with the need to focus the content of the training courses more on practical processes and application rather than on the theories behind OSSF systems.
- The use of multi-media training aids could be used much more frequently and effectively to supplement the traditional lecture portions of the training courses. Several licensees suggested that a video showing the installation process of particular systems from beginning to end would be one such valuable addition to either of the Installer courses.

- Case studies of system installations and/or site evaluations can serve as valuable teaching aids to illustrate a variety of concepts and principles in a way that is more relatable and memorable for many trainees.

7.4 General Training Process Improvements

The following recommendations come directly from the Project Team's extensive interviews with a wide variety of OSSF licensees and deal specifically with recommendations for overall training process improvements across all OSSF training courses.

- There is a need to develop and offer a curriculum for each of the four OSSF courses in Spanish. This is particularly important in South Texas and the Rio Grande Valley area. At a minimum, the training manuals and other course handouts could be made available in Spanish.
- A number of licensees suggested that certain training courses could be substantially improved by allotting additional time to the courses. For instance the instruction portion of the training course could be extended to three whole days with an additional fourth day added on for a brief review and administration of the exam.
- There is a need to develop a variety of true OSSF continuing education courses. If the state is going to require all licensees to take 16 credit hours of continuing education each year in order to maintain their license, there is a need to invest in the development of new courses and content (i.e. more specialized courses) so that licensees are not just taking the same introductory training courses over and over again.
- Licensees expressed a need for more easily accessible and user-friendly information on training and continuing education courses, when they are offered, where they are being offered, pricing information and registration instructions.
- There is a need to improve the current notification system that the state uses to alert licensees of the approaching expiration date of their license. Many interviewees stated that they would prefer a system that alerts licensees to the upcoming expiration date well in advance.
- The development of a monthly or quarterly mail-out publication that contains information for licensed OSSF professionals on topics such as CEUs, regulations, new products, etc. would be extremely helpful to licensees.
- For simplification purposes all OSSF continuing education courses should count as either 8 or 16 credit hours.
- There is a need for improved web access and information related to the requirements or prerequisites for each of the various OSSF licenses.
- Consider sending training manuals out to those registered for the class 2-3 weeks ahead of time (licensees indicated that this was particularly important for predominantly Spanish speakers).

- Offer training and continuing education courses in specific locations on dates that are consistent from year to year in order to improve continuity and convenience for licensed OSSF professionals.
- Try to provide training opportunities in more locations throughout the state.

7.5 General Training Facility Improvements

The following recommendations come directly from the Project Team's extensive interviews with a wide variety of OSSF licensees and deal specifically with recommendations for updating and improving the training facilities used for all OSSF training courses.

- The College Station demonstration area is currently in need of major improvements and updating in order to remain useful as a teaching aid for OSSF training courses in the future.

Section 8
ANALYSIS AND RECOMMENDATIONS

8.1 Overview

Throughout the course of this study, the Project Team has sought to understand precisely how the three Council-funded OSSF training centers are currently being used to serve OSSF industry professionals seeking training and licensing, how effective the training centers have been in accomplishing their purpose, and how the utilization of these training centers might be improved in order to make more effective use of limited Council dollars. The following sections summarize our overall findings and outline our general recommendations for improving the effectiveness of the training centers.

8.2 Adapting Training Focus to Meet Current Needs

In 1997, after several years of meetings and public hearings, TCEQ established new Texas rules for design and installation of OSSF systems. These rules were codified in Title 30, Part 1, Chapter 285 of the Texas Administrative Code. Among other things, the new rules required all OSSF professionals[1] become licensed by January 1, 2002 in order to continue practicing their profession. At that time, the training centers became heavily utilized so that all OSSF professionals could learn about the latest state rules and become licensed in the field by attending the appropriate training course or courses and passing the licensing exam. This resulted in a large initial flood of OSSF professionals into the Council-funded training centers, which served a very important role at that time in facilitating the training and licensing of all non-exempt OSSF professional in the state in response to the rules changes.

Since that time, use of the training centers has waned somewhat as the initial push to "train" and license the entire OSSF professional population in the state has slowed and the training centers have settled into a more recent role of providing training, exam administration and continuing education for the smaller and steadier flow of new entrants into the profession and current OSSF professionals needing to renew or keep their licenses current.

This natural decrease in demand for the services provided by the three Council-funded training facilities over the course of the last nine years has resulted in underutilization of the three training facilities over time. Such underutilization reflects, among other things, an overall shift from a need for initial licensing of industry professionals, towards a now more prominent need for continuing education options for currently

[1] Unless exempt under §30.244.

licensed OSSF professionals. Therefore, there is a need to evaluate how to best utilize the existing training centers in light of this shift and determine the best ways to spend future Council dollars so as to provide the greatest benefit to the industry.

The Project Team conducted interviews with numerous licensed OSSF professionals throughout the state as well as with a variety of persons closely involved with Texas Engineering Extension Service (TEEX), Texas Onsite Wastewater Treatment Research Council (TOWTRC), Texas Onsite Wastewater Association (TOWA) and the overall OSSF training process in order to determine how to best utilize the three Council-funded training centers to meet current OSSF training needs.

8.3 Recommendations

Interviews with a wide variety of licensed OSSF professionals and other persons with substantial knowledge of the three Council-funded training centers and the overall OSSF training system revealed a variety of important findings from which the Project Team has developed four major recommendations that are detailed in the following sections.

8.3.1 Teach Real Skill Sets

There is a need to reduce the amount of straight lecture and increase the amount of hands-on learning. The training centers have fixed facilities which visually depict finished OSSF components. This allows the students to focus their learning more on actual installation/practical application and less on the theory behind systems. The on-site systems available at the training centers are currently largely underutilized as teaching aides within the context of the OSSF licensing courses. It may be appropriate to direct all licensing classes exclusively to the training facilities. These licensing classes are currently provided exclusively by TEEX, so directing new licensees to these facilities would not be difficult, and based on feedback from interviews conducted with licensees and OSSF training professionals, would provide better materials for training.

Depending on the perceived need for the region, one or two of the training centers should be updated so that on-site training for specific OSSF system types is available. Presently, trainees interested in obtaining Installer I or DR licenses benefit most from these facilities, since the fixed facilities represent OSSF systems that they can visually study. Trainees for Installer II and Site Evaluator rarely visit the facilities.

Because of its age, the College Station demonstration area in particular needs improvement and updating if it is to remain useful. Updating the centers to include many OSSF system types could attract Installer II licenses and designers who want to learn the latest technologies. For example, effective training in Drip Irrigation design and installation can take a minimum of one day of classroom training, and another day of hands-on assembly of components. Two days spent at a training facility for instruction in specific, usable information, could be of great benefit.

Informal discussions with TEEX staff and instructors revealed that hands-on training requires smaller classes and more time to teach. As such, the current training curriculum does not include much hands-on training. However, it may be prudent to allow or require more time be devoted to entry level licensing classes in order to provide more of the hands-on training that is desired by both experienced industry professionals and new entrants into the OSSF industry.

8.3.2 Update Course Content and Develop New CEU Topics and Formats

This study indicates a decreasing use of all three Council-funded training centers while OSSF professionals express an increasing need for continuing education options. OSSF professionals must complete at least 16 hours of continuing education each year in order to maintain their license, and they expressed a serious need for new courses and new content (i.e. more specialized courses) that will provide true continuing education options for licensees.

The current lack of good continuing education options at the training centers appears to be one of the primary contributors to the underutilization of these facilities. The training centers appear to be used almost exclusively for TEEX courses by TEEX instructors, and interviews with both industry professionals and OSSF training professionals revealed that the TEEX curriculum has not changed much since the inception of the current licensing requirements and the establishment of the training centers. Many OSSF professionals have recognized this fact, and actively sought out courses offered through alternative providers that include newer, different, and more in-depth information. This combination of factors has led to the severe underutilization of the three Council-funded training centers for continuing education purposes.

In addition to the need for newer and better continuing education options at the training centers, there is also a need for more long-distance teaching. For instance, the lack of participation the Project Team observed at the El Paso training center as a result of long driving distances in West Texas and the much lower density of licensed OSSF professionals in that region, could be mitigated by using the El Paso facility and its superior on-site systems and teaching aides to develop and provide video and/or on-line instruction to licensees.

Each of the training centers could be utilized in this way to develop a variety of courses for fulfilling CEU requirements using multi-media either to teach the course in its entirety or as a supplement that can be used to enhance traditional classes (i.e. showing a video of the installation process from beginning to end). TEEX currently offers limited on-line training options, such as the Soil and Site Evaluation Basic Introduction course and could expand on these offerings to better serve those licensees for whom travel is difficult and schedule and convenience are top priorities.

The training centers could also utilize practical applications of the latest university-level research as possible material for continuing education classes. For example, Texas Tech University, through a Council-funded project, has developed

formulas for combined absorption and evapotransporation effects based on years of experimentation. The training centers could install actual systems of this type and utilize the classroom and/or video to monitor these applications for an extended period of time. This type of practical installation would help OSSF professionals to understand new industry applications on the horizon as well as the basis for certain state rule changes.

Finally, although training center instructors generally received high marks from licensees, there was a common perception that the courses were a bit too academically oriented for the intended audience which typically has somewhat limited academic background and experience. One way to improve these courses and mitigate this perception would be to have an experienced installer team with the regular course instructor to assist with course instruction. Some training courses provided by other industry organizations have utilized instructors with extensive field experience, and the feed back from students on such courses have been very complementary.

Even if it is impractical to have an experienced industry professional participate in the instruction of the licensing courses, it would be helpful for licensees to have access to continuing education courses taught by industry practitioners with significant hands-on experience in dealing with specific systems and installations. Access to the knowledge of an experienced practitioner would provide a great deal of benefit to many OSSF licensees, and would go beyond what can generally be learned from manuals and other printed materials. As previously mentioned, a variety of OSSF industry organizations have successfully used this approach to CEU course instruction.

The following are some of the most commonly recommended CEU topics that the training centers could provide:

- Actual case studies of system installations and/or site evaluations.
- Information on new rules and regulations, explanation of reasons behind rules, and discussion of possible upcoming rules changes or new legislation related to the field.

  Most instructors discuss some aspects of the State rules (current and proposed) during the licensing courses. However, proposed rules are often not well known by these instructors and the existing rules are sometimes misunderstood or incorrectly presented in the classes. This is not a reflection on the instructors, but rather a reflection of how poorly understood many of the rules are in practice.
- Training with new materials and technology on the market.
- Instruction on aerobic systems installation, maintenance and repair, leaching chambers, soil analysis and wetland systems.

  Such courses would ideally be taught by instructors with substantial field experience.
- Course content on troubleshooting different systems.

  In so much as troubleshooting skills are gained from actual experience, instructors with substantial field experience should also teach this course material. With respect to troubleshooting of electrical components, a major deficiency in

this industry, there are several commercial training programs in electrical troubleshooting that could form the basis of this material.

- Develop a comparison chart of different systems as a reference (pros/cons, where they are applicable).

  There are now several options available that could be a correct or preferred solution for the client. Unfortunately, the manufacturers of specific products are promulgating the only knowledge available to practitioners. The shortcomings of their products are understandably not well presented. It is imperative that practitioners are shown how more expensive solutions, for example, could actually better satisfy certain customers. Without that understanding, cheap solutions are all that are offered without consideration of what the customer truly values.

- Address safety issues related to system installation.

  The equipment used to excavate, place materials, and backfill are large, heavy and potentially very dangerous. Training on safety issues related to operating such equipment needs to be readily available.

- Information on where to get equipment for installation and testing of systems.

  This information is readily available from distributors who can make brochures, or at least line sheets, available to class participants.

- An advanced course related to larger/commercial systems.

  The NSF products being used throughout the industry are tested and certified only for residential sewage. However, the treatment of non-residential sewage requires different techniques, and perhaps different products. This is a topic that is currently not being taught or discussed in the State rules.

- Instruction on the use of personal computers, computer-aided design, relevant Internet resource websites, and modern day software applications related to the industry.

8.3.3 Improve Convenience and Communication Related to Training

The results of interviews conducted by the Project Team indicate that there is an overall need to improve convenience and communication related to training. Interviewees commonly expressed the following:

- There is a need for a monthly or quarterly publication with information on CEUs, regulations, new products, and other information of interest to the profession.

  TEEX currently mails out a periodic brochure to all licensees listing their available courses (some of which are held at the training centers) and providing information on the various classes, times, places, dates, and the like. This could be expanded to include additional helpful information on regulations and new products/technologies on the market.

- The need for a better notification system that alerts licensees to the expiration date of their licenses well in advance and provides repeat notification where there is great value placed on the addressee responding positively and in a timely manner.
- A need for easily accessible online information on training and continuing education courses, including when they are offered, where they are being offered, pricing information and clear registration instructions.

  There is also a need to ensure that the location and availability of this information is well publicized, so that licensees will know to refer to it for information.
- Desire for improved access to information on requirements for various licenses.
- A need to provide training opportunities in more locations throughout the state.

  Licensees continually expressed a desire to limit the amount of time they must spend away from their home and/or place of business in order to attend continuing education courses. The convenience of having training courses offered locally seems to outweigh course content or price in many decisions related to CEU training.
- A need to offer training in specific locations on dates that are consistent from year to year.

  Discussions with conference attendees have confirmed that the consistent location and date of the annual TOWTRC conference in Waco is one of the primary contributors to the success of the conference. The same concept could be applied to OSSF licensing and CEU courses. Regularity would help simplify a tendency for professionals to wait until the last minute to obtain their required CEUs each year.
- Possible benefits of a traveling mobile training unit.

  Although the training centers are considered more ideal for many of the initial licensing and training courses, CEU requirements mandate more variety in training and greater convenience. One possible solution for providing training in a wider variety of locations on similar dates each year would be to design a mobile training unit that could travel throughout the state each year, providing several different continuing education course options at each of the selected locations.
- Training manuals should be sent out to those registered for licensing classes two to three weeks in advance.

  Interviews revealed that this can be particularly important for Spanish speakers who may benefit significantly from having additional time to get acquainted with the manual prior to classroom training.

8.3.4 Understand the Audience and Tailor Courses to Their Needs

Interviewees in this study expressed a variety of suggestions for tailoring each of the individual courses and formats to the specific goals and objectives of the course and trainee. The following sections communicate the most common suggestions and recommendations provided by the industry professionals interviewed.

8.3.4.1 Installer I Course

- Course needs to be taught from the perspective of a novice. Since many of the people taking this course are new to the industry, the course material needs to start at a level appropriate for the much less experienced participant.
- Need to focus more on practical installation process rather than theory. Again, the practitioners are hands-on oriented, and theory is lost on them.
- Incorporate illustrations of systems that met specs versus ones that did not and why. Pictures are generally better accepted and appreciated by attendees of vocational license courses, and that is certainly true in the onsite industry. It is very important at this level since the experience of the student is limited and they do not have any personal experience on which to draw in order to distinguish good practices from bad.
- Visual displays and demonstrations are very important for this course making the training centers ideal places to conduct training using on-site systems as teaching aides.
- Include basic instruction on how to use equipment involved in installation or offer an additional short course on equipment. This again comes from the interests of the participants in hands-on subject matters. These are vocational licenses, and vocational courses. The material to be taught must relate directly to the everyday practice in the vocation, not the textbook.
- Be sure to spend adequate time covering the materials that will be most heavily tested. Further, be sure to test the materials that are most important to the success of the individual and the industry and then test for proficiency in those areas.

8.3.4.2 Installer II Course

- Displays and demos are not as important for this course. At this level, class attendees have installed basic systems and used most of the necessary equipment.
- A greater focus on hands-on training would appeal more to this audience. The vocational aspect of this training must be recognized.
- More instruction on aerobic and evapotranspiration systems would be beneficial. The industry often expresses their confidence in how to install these systems, but there is very little understanding of how these processes work, or how to make them work.

- Additional instruction related to aerobic systems and low pressure dosing is desired. The combination of secondary treatment and low pressure dosing, while both viable and permissible, is not promoted by most manufacturers and not discussed in the current curriculum.
- Instruction related to system maintenance would be a beneficial addition to the course. Many of the newer technologies require significant maintenance, resulting in industry professionals needing to better understand what is required to assure successful performance.
- Include information on more cutting edge information in the course. There are always new products and technologies on the market or being tested. Industry professionals have a natural interest in things that are new or up and coming.
- Include use of scale models of different systems in the curriculum. Many proprietary manufacturers make use of such models, and in a purely classroom environment, these scale models are the next best thing to the real thing.
- There is a perceived need to focus more on the practical installation process rather than the theory behind systems. Classroom participants are particularly interested in what they consider "practical" and consider theory of less interest to them.
- Consider making a soil analysis course mandatory for all Installer II licensees. The controlling factor in an installation, more times than not, is the soil since it defines what systems can be used effectively in a given location.
- Consider gearing this course specifically toward different regions of the state (East/West/Central). For example, wetlands are not very effective in East Texas due to the high rainfall patterns and evapotranspiration systems are likewise not very effective in East Texas for much the same reason. Students are particularly interested in learning about the systems that will work well and/or are popular in their locale.
- Consider extending the course to four days with the last day being devoted to a short review session and then the exam. Many licensees commented that there is a lot to learn and that they would be willing and interested in spending more time on certain subjects.
- It would be beneficial to offer two levels of this course (i.e. one version for those with significant experience, and one for those with minimal experience). Comments from industry professionals indicate a need to be simplistic in teaching entry level students, however, the more experienced industry professionals taking this course are looking for more "advanced" level of training.
- Consider offering more courses during fall and winter when installers are not as busy. Work levels typically slow around the beginning of November and pick-up again in mid- April.

8.3.4.3 Site Evaluator Course

- There is a need to incorporate a wider variety of soils from around the state in this course. In addition, there are certain types of soils that are unique to a particular region that should be incorporated into the class.
- Provide an introduction to all equipment and tools that site evaluators need to utilize in performing their job (i.e. laser levels, transit, GPS, etc.). Many students who have greater field experience when they take this course comment that the course material should do a more thorough job of introducing the tools and equipment available to expedite the work.
- The training manual for this course needs significant improvements (i.e. updated information, better organization, table of contents, and addition of an index so that the manual can be used as a quick reference). Interviewees commented that it is difficult to look up a specific item or issue in the manual without reading through the entire document.
- The course needs to include instruction on proper placement of the system on the site. More than just explaining how to measure slope and how to classify soils, licensees desire to hear reasons for placement of systems on the site (i.e. explanation of the advantages of being uphill vs. downhill from the home, etc.).

8.3.4.4 Designated Representative Course

- This course needs to be geared toward the novice. The majority of students in this course tend to have no prior experience in the field, necessitating that the course material start at the most basic of levels.
- Course instruction needs to include more hands-on training and displays or demonstrations. Again, since these students have little to no field experience to draw from, hands-on training, pictures, videos, and physical displays are highly beneficial in helping students relate the training to the field.
- This course should provide instruction on the proper use of a transit and a level.
- Instruction needs to include a chapter on forms, documents and maintenance contracts. Since a large part of the designated representative's responsibility revolves around documents and documentation, an appropriate amount of time must be dedicated to this aspect of the job.
- Inclusion of more instruction related to aerobic systems would be beneficial. Aerobic systems seem to consume more of the designated representative's time than all other systems. Greater instruction related to what to expect, what to do, and what to say should be devoted to aerobic systems.
- All designated representative students should receive instruction on soil classification. All system designs ideally begin with the soils evaluation, making proper soil classification skills necessary for the designated representative to verify, or at least understand, the reasoning behind a proposed design.

- Many designated representative licenses indicated a need for this course to address procedures for dealing with environmental health complaints. Proper procedures and documentation should be covered so that the licensee knows how to handle complaints when they arise.
- This course needs to cover the specific procedures to follow during a field inspection. There are a myriad of items that must be verified in a competent field inspection, and rigorous, specific procedures are very useful in helping designated representatives (experienced or inexperienced) through this process. Furthermore, standardizing the inspection process would improve the overall quality of installations.
- Provide designated representatives with a list of resources and contacts to consult when they encounter new questions following the course. A list of manufacturers and their technical service contacts is easy to acquire and fairly easy to update.
- Many licensees suggested that the course be extended by an additional day or two in order to properly cover all the necessary materials and adequately prepare participants to perform their job properly. Designated representatives are the gatekeepers for designers, installers, service providers and owners within the industry. It is very important that they receive a high level of training and support.
- It may be beneficial to offer the designated representative course as two separate courses (i.e. introductory and advanced). Since there is a limit to the amount of information that can be effectively taught in one sitting, it would be useful to design an introductory class to get licensees sufficiently up to speed to work directly with a senior person and gain experience. Once the licensee has completed the introductory class and attained some minimum level of field experience, an advanced course would position the Designated Representative licensee at an approximately equivalent knowledge and experience level to an Installer II licensee who is required to have two levels of training and mandatory field experience.

Appendix A

Texas On-Site Wastewater Treatment Research Council

Study to Evaluate the Effectiveness and the Benefits of Council-Funded Projects to Meet the Council's Mission

Interview of Licensed Professionals

Name of Licensed Professional: _____

License(s) Held: _____

Region: _____

1. What year did you complete the training program for the *Designated Representative, Installer I, Installer II, Site Evaluator?* _____

2. What year did you get your license for *Designated Representative, Installer I, Installer II, Site Evaluator*? _____

3. Besides the training program for *DR, OSI, OSII, SE* mentioned in question 1, are there any other training programs that you have attended? (*Probing question:* Do you have any other license besides the *DR, OSI, OSII, SE?)*

   _____

   _____

4. What training center location did you attend the training for *DR, OSI, OSII, SE*? *This question refers to the training center location attended for the program named in question 1. If more than one training program is mentioned, questions 4 - 18 should be asked for each training program.*

   ____ El Paso ____Weslaco _____College Station _____Other (Identify)

5. Where did you live when you attended the training program at _____? *The question is to be completed with the training center location mentioned in question 4.*

_____

For the following questions, please use of scale of 1 to 5 where 5 is "strongly agree and 1 is "strongly disagree."

6. The location of the course was convenient. _____
7. The training center had the necessary equipment/displays/ demonstration areas (aerobic treatment system, constructed wetland system, conventional septic tank, etc.) to conduct training effectively. _____
8. The information provided in the training program was clear and easy to understand. _____
9. The training program addressed current issues for you as *DR, OSI, OSII, SE.* _____
10. The training program exam covered aspects addressed in the training program. _____
11. The exam was difficult. _____
12. You would recommend the training program to others. _____
13. Overall, the training program provides useful information. _____

14. For the following question, please use a scale of 1 to 5 where 5 is "very useful" and 1 is "not useful". The materials used at the training program were useful in helping explain the topics. _____

15. For the following question, please use of scale of 1 to 5 where 5 is "very important" and 1 is "not important." When deciding to attend this training program, how important was:
    a. Training program cost _____
    b. Travel distance _____
    c. Program schedule _____
    d. Equipment/displays/demonstration areas (aerobic treatment system, constructed wetland system, conventional septic tank, etc.) _____
    e. Other criteria considered

    _____

    _____

16. What types of equipment or displays were used in the training you attended? How important for the program was the availability and use of equipment /displays /demonstration areas (such as aerobic treatment system, constructed wetland system, conventional septic tank, etc.)? Are there any tools or displays that you would have liked to see and have available that were not?

_____

_____

_____

17. Would you take any additional training at the Training Centers? Why or why not?

_____

_____

_____

18. Please provide any recommendations for that will help increase the quality of training and continuous education for licensed professionals.

_____

_____

_____

Thank you for your feedback.

Appendix B

Designated Representative

Region	Amarillo	Lubbock	Abilene		Arlington		Tyler		El Paso	Midland	San Angelo	Waco	Beaumont	Austin		Houston		San Antonio	Corpus Christi	Harlingen	Laredo	Totals		Average Scores		
Respondents	1	1	1	2	1	2	1	2	1	1	1	1	1	1	2	1	2	1	1	1	1	Sum Total	# of Surveys	All Surveys	Training Center	Non-Training Center
Questions																										
1 Training Year	2001	2001	2003	2004	2002	2004	2003	2004	2004	2002	2005	2002	2004	2003	2001	2005	2003	2004	2001	2002	2002					
2 License Year	2001	2001	2003	2004	2002	2004	2003	2004	2004	2002	2005	2002	2004	2003	2001	2005	2003	2004	2001	2002	2002					
3 Other Training	SE			OS I, SE			SE			OS I, OS II, SE	SE				SE						SE					
4 Training Location	Mesquite	Mesquite	College Station	Mesquite	College Station	Mesquite	Weslaco	Mesquite	Weslaco	College Station	College Station	College Station	College Station	Weslaco	Houston	College Station	College Station	College Station	Austin	Weslaco	Weslaco					
5 Residence at Time of Training	Amarillo	Crosbyton	Brownwood	Abilene	Fort Worth	Fort Worth	Van	Winnsboro	Marfa	Odessa	San Angelo	Brenham	Lufkin	Sunrise Beach	Segin	Willis	League City	New Braunfels	Kingsville	McAllen	Del Rio					
6 Location	1	2	3	5	2	3	1	5	1	4	3	5	5	1	4	5	3	3	2	4	3	65	21	3.1	3.1	3.1
7 Equipment/Displays	3	3	5	5	5	4	5	5	5	4	5	5	5	5	5	4	4	5	2	5	5	94	21	4.5	4.8	3.9
8 Clear/Easy to Understand	3	3	5	4	5	3	4	3	5	5	5	4	4	4	4	3	5	5	5	3	4	86	21	4.1	4.4	3.6
9 Addressed Current Issues	4	4	5	5	3	4	5	2	4	5	5	4	5	3	4	2	5	3	5	3	3	83	21	4.0	3.9	4.0
10 Exam Coverage	3	4	5	5	5	3	4	4	4	5	5	5	5	4	5	2	5	5	5	5	2	90	21	4.3	4.4	4.1
11 Exam Difficulty	4	4	2	4	2	4	4	2	3	4	5	2	4	3	4	1	4	1	2	4	2	65	21	3.1	2.9	3.4
12 Would Recommend	3	3	5	5	5	4	5	5	5	5	5	5	5	4	5	4	4	4	5	5	3	94	21	4.5	4.6	4.3
13 Useful Information	4	4	5	5	3	3	5	5	5	5	5	5	4	3	5	4	5	4	5	4	3	91	21	4.3	4.3	4.4
14 Usefulness of Materials	5	5	5	4	5	2	5	3	4	5	5	5	5	4	4	3	5	5	5	3	2	89	21	4.2	4.4	4.0
15																										
A. Training Program Cost	1	1	5	2	2	1	5	5	1	1	2	1	1	3	3	1	1	2	1	1	1	41	21	2.0	1.9	2.0
B. Travel Distance	3	3	1	1	3	1	1	5	1	3	2	1	2	5	3	1	1	3	5	1	3	49	21	2.3	2.0	3.0
C. Program Schedule	3	3	1	2	3	4	4	5	1	3	5	2	2	5	3	1	1	3	4	3	5	63	21	3.0	2.8	3.4
D. Equipment/Displays/Demos	2	2	1	4	4	3	5	3	5	5	5	3	4	4	4	3	4	1	1	5	5	73	21	3.5	3.9	2.7
E. Other																										

Appendix C

Installer I

	# of Licensees	# Surveys Needed	Surveys Completed
Amarillo	48	2	2
Lubbock	25	2	2
Abilene	87	2	2
Arlington	147	2	2
Tyler	103	2	2
El Paso	19	2	2
Midland	24	2	2
San Angelo	22	2	2
Waco	117	2	2
Beaumont	51	2	2
Austin	135	2	2
Houston	97	2	2
San Antonio	172	2	2
Corpus Christi	57	2	2
Harligen	42	2	2
Laredo	23	2	2
Total	1169	32	32