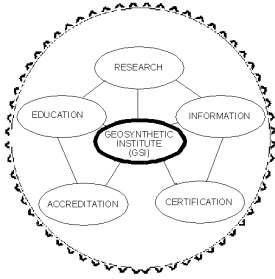




# Two 1 - Day Short Courses

---

---



*Accredited Geosynthetics Laboratories  
Accreditation Designation # GAI-LAP-95-01*

## **CONSTRUCTION QA/QC** **for Compacted Clay & GCL Liner,** **& Geosynthetic Installations**

**Instructors:**

**Dr. Bob Gilbert and Sam Allen**

**with special guest instructor:**

**Mr. Mark Sieracke, Landfill Design and CQA Consultant**

**Wednesday and Thursday, April 02 and 03, 2008**

**&**

**Construction Quality Assurance-Inspectors Certification Program -  
CQA CERTIFICATION EXAM, Friday, April 04, 2008**

**Location:**

**TRI/Environmental, Inc.  
9063 Bee Caves Road  
Austin, Texas 78733**

**Attend and learn about ....**

- **CQA Principles and Plans**
- **Field Tests and Observations**
- **How to maximize the benefit of destructive seam testing**
- **The installation of clay and GCL liners, geomembranes, geotextiles, geocomposites, geogrid and geopenances**
- **The seaming of geomembranes and geotextiles**
- **Leak Location Surveys and Newer CQA Technologies**

**\* Demonstration of Geomembrane Seaming & Sampling Procedures \***

## What's New in Construction Quality Control & Quality Assurance?

Certification of construction quality assurance (CQA) field personnel is back! Formerly governed by NICET, The Geosynthetic Certification Program (GCI) has developed and implemented a CQA certification program for geosynthetic and clay liner CQA field technicians. CQA and construction quality control (CQC) are widely recognized as critically important factors in overall quality management for waste containment facilities. The best of designs and regulatory requirements do not necessarily translate to successful and compliant waste containment facilities unless the waste containment and closure facilities are properly constructed.

This course had been specifically targeted to those persons who have a need for a detailed understanding of proper CQC and CQA procedures for waste containment facilities, and are preparing for the certification exam. This course is intended to aid those who are preparing CQC/CQA plans, reviewing CQC/CQA plans, performing CQC/CQA observations and tests, and reviewing field CQC/CQA procedures. These people include

- Specifying/Certifying Engineers
- Construction/Quality Assurance Project Managers
- Installers/Contractors
- Third Party Inspectors
- Regulators

This course will be presented in two parts, each complementing the other to provide maximum benefit. The first will focus on installation of geomembranes, geotextiles, geocomposites, geogrids and geopenances. The second part will focus on the installation of compacted clay and compacted clay and geosynthetic clay liners (GCLs). Special emphasis will be given to establishing rationale and standard operating procedures for field inspections, documentation of test and visual observations and implementation of CQA plans. A broad based appreciation for the manufacturing and installation of waste containment facility materials will be provided.

## Why you should attend ....

Each student will be allowed to sit for the Construction Quality Assurance-Inspectors Certification Program (CQA-ICP) Exams immediately following the course Construction QA of geosynthetics can be a smooth addition to your Engineering Consulting and Design Practice. Each student will be provided a certificate of course completion, suitable for use in proposals and statements of qualifications for CQC/CQA work.

## Where to stay for the courses

The Mountain Star Lodge - 3573 RR 620, South, Austin, TX 78738. phone: 888 263 2010

## Short Course / GCI Exam Cost/Tuition (see registration form)

### For registrations before Thursday, March 20, 2008

#### Short Course(s)

April 02-03, both courses, 1 registrant per company	\$750.00/person
April 02-03, both courses, 2 registrants per company	\$675.00/person
April 02-03, both courses, 3 + registrants per company	\$600.00/person
April 02-03, both courses, government	\$180.00/person
One course only, 1 registrant per company	\$450.00/person
One course only, 2 registrants per company	\$400.00/person
One course only, 3 + registrants per company	\$350.00/person
One course only, government	\$95.00/person

#### GCI Exam

April 04, TRI fee for one applicant only per company	\$35.00/person*
April 04, TRI fee for 2+ applicants per company	\$20.00/person*
April 04, TRI fee for those attending BOTH Dec 5 <sup>th</sup> & 6 <sup>th</sup> CQA courses	no charge*

**\*The exam costs above DO NOT reflect the cost for sitting for the exam, only TRI's exam proctoring cost for offering the exam as part of the short course event. The GCI exam itself is part of the GCI CQA technician certification program. Thus, one MUST REGISTER with the Geosynthetic Institute (GSI) and pay their required certification fee in order to take this exam. TRI does NOT collect this fee as it must be paid directly to GSI (GSI phone: 610-522-8440).**

## ABOUT TRI

TRI/Environmental, Inc. (TRI) has been active in geosynthetics testing, inspection and research and development for over eighteen years. TRI is an independent, third party laboratory unaffiliated with any manufacturing, engineering/consulting, or construction management firm. TRI's geosynthetics testing laboratories provide a variety of services including the following.

Download registration forms for the courses and exams at [www.GeosyntheticTesting.com](http://www.GeosyntheticTesting.com)

## ABOUT YOUR INSTRUCTORS

### Special Guest Instructor: Mark Sieracke, P.E. - Landfill Design and CQA Consultant

Mark D. Sieracke, P.E. is an industry recognized expert in the fields of landfill design and construction quality assurance. Mark serves as a Principal and Solid Waste Practice Area Manager at Weaver Boos Consultants. Mark has served as a Technical Reviewer of the USEPA Technical Guidance Document: Quality Assurance and Quality Control for Waste Containment Facilities (EPA/600/R- 93/182, Sept. 1993). Mark has served as a hands-on CQA practitioner, certifying engineer and as a consultant for over 1000 acres of geosynthetic installations. He currently contributes routinely to landfill failure investigations and constructibility reviews for design engineers. Mark currently serves on the Waste Management Inc. (WMI) Geosynthetic task force creating the corporate standards for CQA.

### Dr. Robert Gilbert - Professor, University of Texas at Austin

Robert (Bob) Gilbert, Ph.D., P.E. is a professor of civil engineering at The University of Texas at Austin. He has more than ten years of consulting experience in the design and construction of landfill lining and cover systems. He has authored or co-authored numerous publications on the stability of these systems. Dr. Gilbert has been very instrumental in understanding clay and GCL liner systems, interface friction testing, and the use of data for slope stability design.

### Sam Allen - Vice President and Division Manager

Mr. Allen is the Vice President of the Texas Research International (TRI) Geosynthetics Services Division. Sam is the Chairman of Committee D35 on Geosynthetics within ASTM. Sam also serves on the Technical Advisory Board of Geotechnical Fabrics Report, and is special advisor to the In the Lab column presenting testing issues. Sam currently serves on the Board of Directors of the Geosynthetics Institute in Folsom, PA.

## CQA FOR GEOSYNTHETIC INSTALLATIONS SHORT COURSE OUTLINE

Day 1 – Wednesday, April 02, 2008

7:30-8:00am	Registration	
8:00-8:15	Welcome and Introductions	Allen
8:15-8:30	CQA Principles and Philosophy (Responsibilities, appreciation of role, professional considerations and on-site protocol, conflict resolution, etc.)	Sieracke
8:30-9:30	Background of Geosynthetics and Manufacturing (Polymers to products, material properties, product manufacturing)	Allen
9:30-10:30	HDPE & LLDPE & fPP Geomembranes & Seams (Types and specifications, shipping/receiving, unloading, storage & installation)	Sieracke
10:30-10:45	Break	
10:45-11:15 am	HDPE & LLDPE & fPP Geomembranes & Seams - Continued	Sieracke
11:15-12:15	Welding Demonstration/Seam Testing (Double track fusion welds, extrusion welds, "T" welds, seam sampling, peel and shear testing, peel incursion and strain measurements, modes of failure, break codes, field vs laboratory testing)	Sieracke & Installer
12:15-1:00	Lunch (provided)	
1:00-2:00	<b>Special Guest Lecture: TBA</b>	
2:00-2:30	PVC Geomembranes & Seams (Types and specifications, shipping/receiving, unloading, storage & installation)	Allen
2:30-3:30	Geotextiles, Geonets/Geocomposites, Geogrids, Pipe, Erosion Control (Types and specifications, shipping/receiving, unloading, storage & installation)	Allen
3:30-3:45	Break	
3:45-4:30	Protection and Soil Cover	Sieracke
4:30-4:45	CQA Paperwork and Record Keeping (Importance of documentation, communication records, examples of record keeping and documentation, checklists)	Sieracke
4:45-5:00 pm	Discussion	
5:00-6:30 pm	Tour of TRI Geosynthetic Testing and Research Laboratories (test demonstrations, explanation of some TRI internal R&D projects, etc.)	
6:00-8:00	<b>Texas BBQ Dinner !!!! (provided)</b>	

**CQA FOR COMPACTED CLAY & GEOSYNTHETIC CLAY LINER INSTALLATIONS**  
**SHORT COURSE OUTLINE**  
**Day 2: Thursday, April 03, 2008**

8:00-8:30 am	Registration
8:30-9:00	Liner and Cover Systems (single liners/double liners/composite liners, leakage rates through soil, composite action with geomembranes, importance of drainage layer properties)
9:00-10:30	Compacted Clay (materials, factors affecting hydraulic conductivity, clod vs. particle orientation theory, keys to low hydraulic conductivity, water content-density criteria, recommended procedures for determining acceptable zone, influence of overburden stress, bonding of lifts, thickness)
10:30-10:45	break
10:45-12:00	Construction of Compacted Clay Liners and Covers (equipment, preprocessing of soil, soil moisture control, sieving, clod control, crushing/pulverizing materials, compaction, test pads)
Noon-1:00 pm	Lunch (provided)
1:00-2:00	CQA for Compacted Clay Liners and Covers (CQA principles, CQA plan, tests, observations, field water content tests, field density tests, hydraulic conductivity compliance tests, frequency of tests, sampling pattern, outliers, corrective action, role of test pads, final certification)
2:00-3:00	History of GCLs (commercially-produced GCLs, geosynthetic materials, manufacturing of GCLs,, manufacturing quality control, recommended specifications)
3:00-3:15	break
3:15-4:00	Bentonite (measures of and tests for bentonite quality, recommended specifications for bentonite in GCLs, contaminant-resistant bentonite)
4:00-5:00	Installation of GCLs (transportation, handling, storage, subgrade preparation, placement procedures, seaming protection, construction quality control and assurance, observations, types of tests, frequency of testing, field case history)
5:00-5:30	Open discussion

**Day 3 - Friday, April 04, 2008**

**CERTIFICATION EXAM**  
**Construction Quality Assurance-Inspectors Certification Program**

7:45-8:00 am	Registration and Introduction
8:00-10:00 am	Geosynthetic Exam
10:00 - 10:25 am	Break (on your own)
10:30-11:30 am	Compacted Clay Liner Exam

INFORMATION regarding exams:

1) ALL students wishing to sit for the exam(s) **MUST FIRST register for certification through the Geosynthetics Certification Institute and pay the applicable fees directly to GSI** (phone: 610-522-8440). GSI registration must be received by the GSI 7-10 days before the December 7th exam(s).

2) Students are **REQUIRED** to bring a government-issued photo ID prior to entering the testing room. They must also supply the Proctor with a photocopy of the ID when turning in the test.

3) Time allowed:

Students will be given two hours to take the geosynthetic test. There are 140 questions and you must answer 70% of the questions correctly in order to pass. Please note that there is only one correct answer for each question.

You will be given one hour to take the compacted clay liner test; there are 30 questions and you must answer 70% of the questions correctly in order to pass. Please note that there is only one correct answer for each question.

4. The test is a multiple-choice test. The student must circle the correct answer (and only one answer) for each question. They must not select multiple answers for the same question.

