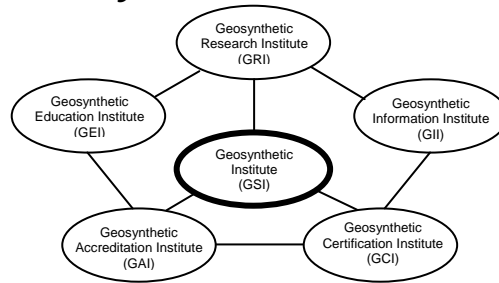


The GSI Newsletter/Report

Geosynthetic Institute



Vol. 22, No. 1

March 2008

This quarterly newsletter, now in its 22nd year, presents the activities of GSI and its related institutes to all who are interested. It is available on the institute's home page at www.geosynthetic-institute.org. It also serves as a quarterly report to its member organizations. Details are available by contacting Robert M. Koerner or Marilyn Ashley at phone (610) 522-8440; fax (610) 522-8441 or e-mail at robert.koerner@coe.drexel.edu or mvashley@verizon.net.

Activities of the Institute Directors & GSI Board of Directors

The Board of Directors met in Cancun, Mexico on March 6, 2008 with the following items discussed and agreed upon.

1. The financial health of the institute was discussed as well as the GSI Endowment Fund. Regarding this fund we will begin immediately with a worldwide solicitation of requests-for-proposals (RFPs) from doctoral candidates in engineering and science for "innovative geosynthetics research and development". The successful students will be known as GSI-Fellows. RFPs will be reviewed and ranked by the entire GSI board members. A number will be accepted each carrying a stipend of \$10,000. The actual solicitation will be presented later in this report.
2. In light of GSI being 38% non-US we felt that a second international board member should be on the BoD. It was decided to use one of the two "At-Large" positions for this purpose. This will require a By-Law change so all will have an input in due course.
3. The GRI-22 Conference to be held in Salt Lake City between February 25-27, 2009 will have the theme:

"It's All in the Details"

Of course we mean geosynthetic details and it will cover all facets of geosynthetic activities, i.e., manufacturing, design, installation, and inspection. We are presently accepting titles, so please consider this opportunity and send a title to us as soon as possible.

NOTICE: Due to the increasing cost of printing, shipping and handling, this Newsletter/Report will be made available on our Home Page at www.geosynthetic-institute.org. It is in the open section under the heading "Newsletter/Report". Please share it with your friends and colleagues.

4. Tony Eith of Waste Management Inc. was re-elected as the GSI board chairman.
5. A photo and listing of the GSI Board of Directors follow. Please don't hesitate to contact any of them with respect to GSI activities and programs.



IN THIS ISSUE

- Activities of the GSI Directors and Board
- Overview of GRI Projects (Research)
- Activities within GII (Information)
- Progress within GEI (Education)
- Activities within GAI (Accreditation)
- Activities within GCI (Certification)
- The GSI Affiliate Institutes
- The GSI Centers-of-Excellence
- Items of Interest
- Review & Analysis of our GRI-21 Conference
- Upcoming Events
- GSI's Member Organizations

Term Ends 2008

Dick Stulgis - GeoTesting Express (Consultants and Testing Laboratories)

Gary Kolbasuk - Raven (Geomembranes and GCLs)

Mark Sieracke - Weaver Boos Consultants, Inc. (At-Large)

Term Ends 2009

Tony Eith (Chairman) - Waste Management Inc. (Owners and Operators)

Boyd Ramsey - GSE Lining Technology, Inc. (Geotextiles and Geogrids)

Sam Allen - TRI/Environmental, Inc. (At-Large)

Term Ends 2010

David Jaros - Corps of Engineers (Government Agencies)

Paul Oliveira - Firestone bp Inc. (Resin Producers)

Kent von Maubeuge - NAUE GmbH & Co. KG (International)

Overview of GRI Projects (Research)

Each issue of our Newsletter/Report provides a brief glimpse and update of current GRI research projects. Details and full briefings are available to member organizations at their request. Dr. Grace Hsuan, Associate Director of GRI can be contacted for additional information as can the other project managers listed in the following write-ups. **Projects marked with an asterisk have been written up as either short "in-progress" papers or complete papers.** Grace can be reached by phone at (610) 522-8440 or e-mail at <grace.hsuan@coe.drexel.edu>.

- 1. Stress Cracking of Geomembranes and Geopipe*** - In addition to Grace Hsuan's ongoing evaluations of HDPE geomembranes, She is presently focusing on HDPE drainage and duct pipe mainly for the Florida DOT. The goal for both geomembranes and geopipe is to include technically viable test methods and limiting values for inclusion in generic specifications.
- 2. Durability of Polypropylene Geotextile Fibers** - Incubation at temperatures of 75, 65 and 55°C in high oxygen pressure containers is ongoing using PP-woven geotextile fibers. This study periodically measures changes in density, dimensions, mass, morphology, strength, elongation, modulus, melt index, OIT and carbonyl content. Dr. Hsuan is in charge of the project.
- 3. In-Situ Temperature Monitoring of Liner and Cover Geomembranes in Dry and Wet Landfills*** - Dr. George Koerner is measuring the in-situ temperature behavior of liner and cover geomembranes and has installed 60± thermocouples for long term measurements in both wet and dry municipal solid waste landfills in Pennsylvania. Presently data for up to 13-years is available.

- 4. Bioreactor (aka, Wet) Landfill Behavior and Properties*** - One of the above mentioned cells is at field capacity, hence it is a true anaerobic bioreactor. Dr. George Koerner is in charge of considerable monitoring at this cell which includes the following

- waste moisture content
- waste temperature
- leachate chemical analysis
- waste gas analysis
- perched leachate within the waste

Data is being collected on a monthly basis. The timeline of the project calls for monitoring for 5 to 10 years. This activity will now extend to an adjacent landfill to see how reproducible the data is with a slightly different waste mass.

- 5. Flow Behavior of Fully Degraded Waste*** - A field project under sponsorship of GSI and Waste Management investigates the drainage of highly degraded MSW placed directly on leachate collection systems. The leachate collection systems consist of both natural soils and geosynthetic drains. The project is now in its third year and is at a landfill in the Philadelphia area.
- 6. Hydrostatic Creep Puncture of Geomembranes*** - A series of tests using 600 g/m² protection geotextiles on 1.5 mm thick HDPE geomembranes is being evaluated; the time is currently 10-years. The four-test setups use truncated cone simulations of coarse subgrade stones against the geotextile protecting the underlying geomembrane. The behavior of the geomembranes under these tests is a combination of creep and stress relaxation. The purpose of these tests is to better define the creep reduction factor used in the design method.
- 7. Long-Term Benefits of Geotextile Separators*** - A full-scale field database of using geotextile separators on firm soil subgrades is being developed and maintained by Dr. George Koerner. Monitoring will be for 20⁺ years. The target sites are paved highways, driveways, parking lots, etc., where control sections without geotextiles are also available for comparison purposes. This database is national in scope. Included are sites which meet the following criteria:
 - sites must have both geotextile and nongeotextile control sections
 - known type of geotextile(s)
 - known soil conditions
 - known traffic conditions
 - available hydrologic and environmental conditions
 - capability of quantifying the original condition of the pavement surface vs. the aged condition... this will be accomplished visually

as well as by using falling weight deflectometers.

There are currently 14-sites included in this program. If you have additional sites to add, please contact George at (610) 522-8440.

8. **UV Exposure of Geomembranes*** - GSI is using UV-fluorescent devices to evaluate the projected outdoor lifetime of nine different types of geomembranes; HDPE, LLDPE, 4 fPPs, PVC, EPDM and PE-R. The effort is considered as part of GSI's Center for Polymers in Hydraulic Structures (CPHyS), but has relevancy in many other applications as well.
9. **UV Exposure of Geogrids** - We have recently begun the UV-fluorescent exposure of four different biaxial geogrids which are used at the exposed surfaces of welded wire mesh retaining walls. The geogrids are now up to 7000 light hours and ongoing data is being generated and sent to the respective manufacturers.
10. **UV Exposure of TRM Fibers** - We will begin UV-fluorescent exposure of several turf reinforcement mat fibers to assess their lifetime capabilities. Contact Bob Koerner for inclusion into this effort.
11. **Generic Specifications** - A major effort is ongoing with respect to the development and maintenance of generic geosynthetic specifications. The current status of these specifications is as follows:

Completed and Ongoing

GM13 – HDPE Geomembranes
GM17 – LLDPE Geomembranes
GM21 – EPDM Geomembranes
GM22 – Exposed Temporary Covers
GM19 – Geomembrane Seams
GT10 – Geotextile Tubes
GT12 – Geotextile Cushions
GT13 – Geotextile Separators
GCL3 – Geosynthetic Clay Liners

Working Within Focus Groups

GCXX – TRMs for Erosion Control
GTXX – High Strength Reinforcement Geotextiles

Delayed or Off in the Distance

GGXX – Bidirectional Geogrids
GGXX – Unidirectional Geogrids
GNXX – Geonet Drainage Composites
GCXX – Drainage Geocomposites

Tabled

GM18 – fPP & fPP-R Geomembranes

The complete specifications are available to everyone (members and nonmembers) on the

open section of our Home Page. Please download and use them accordingly. Also note that this is where the latest modification will always be available.

12. **Announcement for GSI-Fellows** – The following announcement has been sent to numerous magazines and newsletter services. Please broadcast it to your favorite academic institution to give it the widest possible circulation. Thank you.

REQUEST-FOR-PROPOSALS

The Geosynthetic Institute (GSI) is delighted to announce a worldwide call for student requests-for-proposals (RFPs) focusing on innovative geosynthetics research and development projects. There will be multiple awards made, each for \$10,000 per year, and they are renewable, pending an annual written report, to a total amount of \$25,000 per student. It is important to note that students must have completed their candidacy examinations leading to a doctoral degree in engineering or science to be eligible. The proposals must be submitted in the following four page format (with no exceptions).

Page 1 – Letter of recommendation from student's department head or advisor
Page 2 – Title and detailed abstract
Page 3 – Student's resume
Page 4 – Documentation of completed candidacy examination

The RFPs for the 2008-2009 academic year must be submitted to both of the undersigned by e-mail by July 15, 2008 and awards will be announced on, or before, September 1, 2008. Review of the proposals is by the nine-person Board of Directors of GSI. For information on the institution, visit us at the following website:

www.geosynthetic-institute.org

Robert M. Koerner, Ph.D, P.E., NAE
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Jamie R. Koerner
Special Projects Coordinator
e-mail jrkoerner@verizon.net

Activities within GII (Information)

We are currently supporting 2-Home Pages. The first is the GRI Home Page which is accessed as follows:

<<<http://www.drexel.edu/gri>>>

This home page is very introductory as far as GSI members and associate members are concerned, and is meant to be promotional (for prospective students and potential institute members). It is probably only of nominal interest to most readers of this Newsletter/Report.

The second home page is the primary GSI Home Page and is accessed as follows:

<<<http://www.geosynthetic-institute.org>>>

It has been reconfigured through the fine efforts of Marilyn Ashley. Everyone (members and nonmembers) can access the open part, which has the following menu:

- Introduction to GSI
- Prospectus
- Associate Membership (Agencies)
- Members by Focus Groups
- GSI Publications
- GRI Specs, Guides, White Papers
- CPReS
- CPHyS
- Laboratory Accreditation
- Answers to Your Questions
- Newsletter/Reports
- Geosynthetics Links
- GSI Annual Meeting
- GSI Focus Group Meeting
- GSI Short Courses
- Inspector Certification Exams

To go further one needs a members-only password. Your contact person (see the last section of this Newsletter/Report if you do not know who it is) must get a password from Marilyn Ashley. Marilyn can be reached by e-mail at mvashley@verizon.net. When you get into this section, the following information is presented. This includes:

- GRI Test Methods
- GRI Reports (Summaries)
- GRI Technical Papers (Citations)
- Notes of GSI Meetings
- Links to the GSs World
- Keyword Search for Literature
- Example Problems
- Frequently Asked Questions (FAQs)

The keywords section contains about 25,000 citations of all of the geosynthetics literature published in English. It's quite easy to use provided that you have a specific topic, or area, in mind. This is the section that we (and others we are told) use the most in our entire website.

Progress within GEI (Education)

We sent a broadcast e-mail to everyone on February 25, 2008 stating that many power point presentations were available and would be sent upon request. About 20 persons replied asking for all of them. The answer is of course we will do so but it will require us to put them on a DVD or flash-drive which we will get to in the near future. Please be patient in this regard... thank you.

We have scheduled the following sequence of courses for the winter season:

December 8, 2008 and March 9, 2009
Geosynthetic Design in Waste Containment Systems

June 18, 2008, December 9, 2008, and March 10, 2008

Quality Control/Quality Assurance of Geosynthetics

The above courses will be held at:

Geosynthetic Institute
475 Kedron Avenue
Folsom, PA 19033
(approx. 4.5 miles from Phila. International Airport)

Course Registration and Fee:

\$250/person for each one-day course (up to one month prior to course)
\$300/person thereafter
\$150/person – GSI Members

Contact: Marilyn Ashley (mvashley@verizon.net)

Activities within GAI (Accreditation)

The Geosynthetic Accreditation Institute's (GAI) current mission is focused on a Laboratory Accreditation Program (LAP) for all geosynthetic test methods. George Koerner is in charge of the program. The GAI-LAP was developed for accrediting geosynthetic testing laboratories on a test-by-test basis. GAI-LAP suggests that laboratories use ISO 17025 as their quality system model.

It should be made clear, however, that GAI-LAP does not profess to offer ISO certification, nor does it "certify" laboratory results. GAI-LAP provides accreditation to laboratories showing compliance with equipment and documentation for specific standard test methods, usually ASTM or ISO standards. GAI-LAP verifies that an effective quality system exists at accredited laboratories by way of proficiency testing.

As of March, 2008, the following laboratories are accredited by the GAI-LAP for the number of test methods listed in parenthesis. Contact personnel and telephone numbers are also listed.

- 1^A - TRI/Environmental Inc. (118 tests)
Sam Allen -- (512) 263-2101
- 3^A - Golder Associates (43 tests)
Henry Mock -- (770) 496-8280
- 4^C - Geosynthetic Institute (114 tests)
George Koerner -- (610) 522-8440
- 6^A - GeoSystems Consultants (27)
Craig Calabria -- (215) 654-9600
- 8^B - Propex, Ringgold (19 tests)
Todd Nichols -- (800) 258-3121
- 9^B - Propex, Alto (10 tests)
Melvin Wallace -- (770) 532-9756
- 11^A - STS Consultants Ltd. (13 tests)
Bill Quinn -- (847) 279-2500
- 13^A - Precision Laboratories, CA (95 tests)
Ron Belanger -- (714) 520-9631
- 14^A - Geotechnics (61 tests)
J. P. Kline -- (412) 823-7600
- 19^A - HTS Inc. (42 tests)
Larry McMichael -- (713) 692-8373

- 20^A - GeoTesting Express, MA (58 tests)
Gary Torosian -- (978) 635-0424
- 22^B - CETCO Arlington Heights (12 tests)
Jim Olsta -- (847) 392-5800
- 23^B - CETCO Cartersville (10 tests)
Sid Weiser -- (706) 337-5316
- 24^B - CETCO Lovell (10 tests)
Roger Wilkerson -- (307) 548-6521
- 25^B - Ten Cate, Pendergrass (11 tests)
Beth Wilbanks -- (706) 693-2226
- 26^B - Agru America Inc. (14 tests)
Grant Palmer -- (843) 546-0600
- 29^C - FITI Testing & Research Institute (70 tests)
Moon-Hyun Jeong -- (011-82-2-960-8034)
- 31^D - NYS Dept. of Transportation (9 tests)
James Curtis -- (518) 457-4735
- 32^A - Vector Engineering (6 tests)
Ken Criley -- (530) 272-2448
- 34^B - GSE Richey Road (16 tests)
Jane Allen -- (281) 230-6726
- 37^B - GSE Chile (16 tests)
Mauricio Ossa -- 56-2 6010153
- 38^C - Sageos/CTT Group (82 tests)
Eric Blond -- (450) 771-4608
- 40^B - GSE Lining Technology Inc. (14 tests)
Charles Miller -- (843) 382-4603
- 41^A - SGI Testing Service, LLC (18 tests)
Zehong Yuan -- (770) 931-8222
- 42^C - NPUST (GSI-Taiwan) (39 tests)
Chiwan Wayne Hsieh -- 011-886-8-7740468
- 43^A - Ardaman & Associates (18 tests)
George DeStafano -- (407) 855-3860
- 44^B - BBA Fiber Web, Inc. (9 tests)
Ken McLain -- (615) 847-7575
- 45^B - Ten Cate Malaysia SDN Bhd. (23 tests)
C. P. Ng -- (603) 519 28568
- 46^B - Bentofix Technologies (13 tests)
Colin Murphy -- (705) 725-1938
- 47^A - Precision Laboratories, TX (13 tests)
Ron Belanger -- (866) 522-0843
- 48^B - Tenax Corporation (9 tests)
Andrew Barker -- (410) 522-7000
- 49^B - Engopol Geossinteticos (20 tests)
George Nastas -- (55) 11-4166 3001
- 50^B - ADS, Inc. Hamilton (7 tests)
Terry McElfresh -- (513) 896-2065
- 51^B - Solmax International Inc. (14 tests)
Guy Elie -- (450) 929-1234
- 53^B - Polytex Iniquique (13 tests)
Cristian Valdebenito -- 011 56 57 42 90 00
- 54^B - ADS, Inc. Finley (9 tests)
David Gonso -- (419) 424-8377
- 55^B - Atarfil Geomembranes (21 tests)
Isabel Merida Fernandez -- 34 958 439 278
- 56^B - Polytex Santiago (11 Tests)
Jamie Morales -- 56-2-627-2054
- 57^B - Ten Cate Cornelia (15 Tests)
Melissa Medlin -- (706) 778-9794
- 58^B - Propex Nashville (9 Tests)
Tim Smith -- (229) 686-5511
- 59^B - Firestone (9 Tests)
Janie Simpson -- (864) 439-5641

^AThird Party Independent ^CInstitute
^BManufacturers QC ^DGovernment

If you are interested in this program and would like a copy of the GAI-LAP directory, please advise accordingly. A directory is published annually in December, and is also kept current on GRI's Home page at <http://www.geosynthetic-institute.org>. For additional information on the GAI-LAP program contact:

George R. Koerner, Ph.D., P.E., CQA

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475 Kedron Avenue
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Telephone: (610) 522-8440
Fax: (610) 522-8441
E-mail: gkoerner@dca.net

The GAI-LAP annual meeting to be held on June 26, 2008 in Denver, CO in conjunction with ASTM.

Activities within GCI (Certification)

Due in part to the active interest by many GSI members and associate members we give the outcomes of the Inspectors Certification Program to date. The table following gives the pass/fail statistics by year as well as insight as to the impact of taking a course before the written examination. In looking at the data it appears as though we are not "teaching-the-exam" and, if anything, there is an inverse correlation; no comment in this regard...

Year	Course Situation	Geosynthetic Materials		Compacted Clay Liners	
		No. of people taking the exam	No. of people failing the exam	No. of people taking the exam	No. of people failing the exam
2006	GSI Course	34	0	27	5 (18%)
	Other Course	59	3 (5%)	57	4 (7%)
	No Course	48	2 (4%)	44	3 (7%)
	TOTAL	141	5 (3%)	128	12 (9%)
2007	GSI Course	46	9 (19%)	38	6 (16%)
	Other Course	18	2 (11%)	18	3 (16%)
	No Course	18	0	17	3 (17%)
	TOTAL	82	11 (13%)	73	12 (16%)
2008 (to date)	GSI Course	14	3 (21%)	13	3 (23%)
	Other Course	0	0	0	0
	No Course	17	3 (18%)	16	1 (6%)
	TOTAL	31	6 (19%)	29	4 (14%)
2006- 2008 (to date)	GSI Course	94	12 (13%)	78	14 (18%)
	Other Course	77	5 (6%)	75	7 (9%)
	No Course	83	5 (6%)	77	7 (9%)
	TOTAL	254	22 (9%)	230	28 (12%)

The GSI Affiliated Institutes

It has long been realized that the information generated within the GSI group should have a timely outlet to all countries, and in all languages. To this end, GSI has created affiliated institutes in two countries (Korea and Taiwan), and potentially others in the future. These affiliated institutes are full members of GSI and are empowered to translate and use all available information so as to create similar institutes and activities in their respective countries.

GSI-Korea was formed on February 9, 1998 as a collaborative effort between FITI Testing and Research Institute (a quasi-government organization) and INHA

University (through its Geosynthetics Research Laboratory).

FITI is a 30-year old testing organization located in Seoul focusing on interlaboratory proficiency; environmental protection; safety and flammability; hazardous substances; in-house quality control; consumer protection; complaint analysis; quality marking; procurement; household and industrial applications; and materials approval. The geosynthetics testing group within FITI has 12 people (2 with doctoral degrees) and 10 engineers. The geosynthetic laboratory is GAI-LAP accredited for 70 geosynthetic test methods. Dr. Jeonghyo Kim is the general manager within FITI's geosynthetics activities.

INHA University is located in Incheon and the geosynthetics laboratory is led by Professor Han-Yong Jeon. Dr. Jeon has 10-students working on geosynthetic-related projects and is extremely active both nationally and internationally.

GSI-Taiwan was formed on August 18, 2000 and is wholly contained within the National Pingtung University of Science and Technology in Nei Pu, Pingtung (southern Taiwan). It completely parallels GSI in that it has specific units for research, education, information, accreditation and certification. The Director is Dr. Chiwan Wayne Hsieh who is a Professor in the Department of Civil Engineering and Director of the Computer Center. GSI-Taiwan has an Taiwanese consortium of geogrid/geotextile manufacturers who work toward producing quality products according to the draft GRI geogrid specifications and the associated test methods. As such, GSI-Taiwan is a GAI-LAP accredited laboratory for 32 geosynthetic test methods. Dr. Hsieh has 10-students working on geosynthetic-related projects and is extremely active nationally and internationally. GSI Taiwan has hosted two very successful conferences to date and has plans for another, followed by a broader conference for Southeast Asia.

The Geosynthetic Institute Centers-of-Excellence

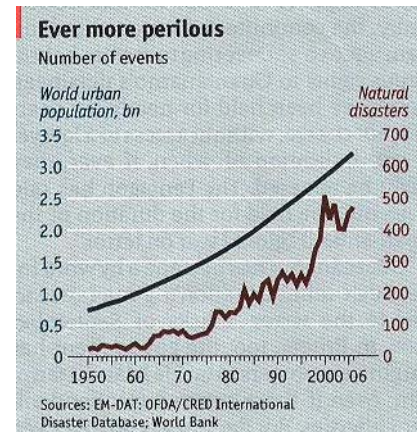
1. The Center for Polymeric Reinforced Structures (CPReS) was formed on Dec. 27, 2002 for the purpose of proper use of geosynthetics in walls, slopes, and foundation reinforcement. It involves Dov Leshchinsky of Delaware, Grace Hsuan of Drexel and George Koerner of GSI as Co-Directors. The mission statement and goals are available on the GSI Home Page at <geosynthetic-institute.org>.

2. The Center for Polymers in Hydraulic Structures (CPHyS) was formed on June 20, 2003 for the purpose of proper use of geosynthetics in dams, canals, reservoirs, tunnels, pipes and related hydraulic systems. Jorge Zornberg of the University of Texas at Austin, Grace Hsuan of Drexel, and George Koerner of GSI are Co-Directors. The mission statement and goals are available on the GSI Home Page at <<geosynthetic-institute.org>>.
3. In both CPReS and CPHyS, Bob Koerner acts in an advisory manner and as a peer reviewer. In both centers existing GSI Members and Associate Members are fully entitled to the information that is developed and their interaction is encouraged.
4. There is a distinct possibility for additional centers of this type. In particular we are looking to team with a university specializing in CAFO's, i.e., large-scale agricultural operations and possibly aquaculture and mining operations as well. Please contact Bob Koerner with suggestions and ideas.

Items of Interest

1. Urban Death Toll from Catastrophes

As the world's population grows, people are crowding into mega-metropolises, where life's risks are greatly concentrated. The after-effects of a natural disaster can be especially dire in a vast, densely-packed area. See the following graph.



(ref. *The Economist*, October 6, 2007)

2. Dam Rehabilitation Bill Passes House

The House of Representatives approved the Dam Rehabilitation and Repair Act (H.R. 3224). Passed on October 29 by a vote of 263 to 102, the legislation would authorize a new federal program to provide grants to states for rehabilitating certain publicly owned dams. H. R. 3224 now awaits

action in the Senate, where companion legislation was recently introduced.

(ref., *Civil Engineering*, December, 2007)

3. Estimated MSW Quantities by Country

While the following table is a bit dated, the information is most interesting.

Estimated MSW quantities in 1997 (total in tonnes and in amount per capita) for European countries.

Country	Total amounts generated (1000 tonnes)		Amounts per capita (kg/capita)	
	MSW	Of which household waste	MSW	Of which household waste
Austria	4,100	2,775	510	340
Belgium	4,852	-	480	-
Denmark	2,951	2,776	560	530
Finland	2,100	870	410	170
France	28,800	20,800	480	350
Germany	36,976	35,402	460	440
Greece	3,900	-	370	-
Ireland	2,032	1,325	560	370
Italy	26,605	-	460	-
Luxembourg	193	100	460	250
Netherlands	8,716	7,471	560	480
Portugal	3,800	-	380	-
Spain	15,307	-	390	-
Sweden	3,200	-	360	-
UK	28,000	26,000	480	440
Czech. Rep.	3,200	2,600	310	250
Hungary	5,000	3,350	500	330
Poland	12,183	8,169	320	210
Slovak Rep.	1,800	1,100	340	200

Source: OECD (1999)

4. GMA Takes a Great Stride Forward

Representative Heath Shuler, (D-NC) gave the following open statement in the House Transportation and Infrastructure, Subcommittee on Water Resources and the Environment hearing on the Water Resources Development Act of 2008. This hearing statement was made on February 7, 2008.

“As a real estate developer, I am very familiar with the infrastructure requirements for new development. One of the greatest tools we deployed was long lasting geosynthetics under newly paved roads. The performance of roads built with geosynthetics was always superior to those built without geosynthetics and geosynthetics are better for the environment as well as drainage around roads. Buttressing my personal experience with geosynthetics is evidence from the federal government about the benefits associated with utilizing geosynthetic materials.

In the late 1980s the U.S. Department of Interior, Bureau of Reclamation undertook a comprehensive series of tests and investigations to evaluate the use of geosynthetic systems to line canals throughout the western United States. The conclusions of the report highlight a 90% reduction in leakage and a lifespan of the systems of 50 years (U.S. Dept. of Interior, Bureau of Reclamation, report R-02-03).

In the early 1980s, the U.S. EPA mandated the usage of HDPE liners as subsurface barrier layers in the nation’s landfills and waste storage facilities. This resulted in the American Society of Civil Engineers (ASCE) offering the highest grade given to the area of solid waste management in their “Report Card” on America’s infrastructure (link to this specific report is as follows:

<http://www.asce.org/reportcard/2005/page.cfm?id=33>).

Review and Analysis of our GRI-21 Conference

Our 21st annual GRI conference went off without a hitch in Cancun, Mexico on March 5, 2008. The morning session was devoted to geosynthetics in agriculture applications and had seven presentations. Use of geosynthetics in agricultural activities in Taiwan are impressive. The use of large bags for silage and capture of animal waste for gas generation and on-farm usage was presented in two separate papers. Capillary breaks for near surface water storage was an interesting paper. Liners (geomembranes or GCLs) were presented as well as covers for animal waste containment. Interesting odor absorbing and odor containment papers were two strategies offered for cover systems. An in-depth panel discussion by all participants followed the oral presentations.

The afternoon session was devoted to geosynthetics in aquaculture applications and it also had seven presentations. Aquaculture activities in Taiwan using geosynthetics was seen to be very impressive. Fish hatchery and shrimp pond liners were both described in separate papers. Turbidity curtains along with hydraulic loads on fish pens and cages were presented. Anchored geosynthetics and geotextile tubes as artificial reefs were described for both fish habitats and recreational purposes. An in-depth panel discussion by all participants followed the oral presentations.

A special presentation by Bob Denis of Solmax International in Varennes, Quebec concluded the conference, and what a conclusion it was. Bob’s lecture focused on the continued need for research and development in the geosynthetics industry. Not only was it a treat for the room-filled audience, it was

even in three-dimensions!. It was an outstanding lecture with a spot-on message to conclude the conference. The GRI-21 Proceedings on CD is available through the IFAI Bookstore.

Upcoming Events

- April 2-3, 2008
QA/QC Short Course and CCL Short Course
TRI, Austin, Texas
Contact: <Sallen@tri-env.com>
- June 2-4, 2008
4th Intl. Conf. on Waste Management
Granada, Spain
Contact:
<<http://www.wessex.ac.uk/conferences/2008/waste08/index.html>>
- June 17-20, 2008
Geosynthetics Asia 2008
Shanghai, China
Contact: <ccigs@4acq-2008sh.com>
- June 18, 2008, December 8, 2008 and March 10, 2009
GSI Short Course on :
QA/QC of Geosynthetics
GSI in Folsom (Philadelphia), PA
Contact: mvashley@verizon.net
- June 25-27, 2008
ASTM D35 on Geosynthetics
Denver, Colorado
Contact: <csierke@astm.com>
- September 7-10, 2008
Global Waste Mgmt. Symposium
Cooper Mountain, CO
Contact: <www.wastesymposium.com>
- September 7-10, 2008
EuroGeo 4
Edinburgh, Scotland
Contact: <eurogeo4@eurogeo4.org>
- December 8, 2008 and March 9, 2009
GS Design in Waste Containment Systems
GSI in Folsom (Philadelphia), PA
Contact: mvashley@verizon.net

GSI's Member Organizations

We sincerely thank all of our sponsoring organizations. Without them, GSI simply could neither happen nor exist. The current GSI member organizations and their contact members are listed below. The newest member organization is Jones Edmunds, Inc. with Don Hullings as the contact member.

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Firestone Specialty Products

Mark Munley/Paul Oliveira [BoD]

FITI (GSI-Korea)

Jeonhyo Kim/H.-Y. Jeon

Waste Management Inc.

Anthony W. Eith [BOD]/Greg Cekander/

Charles P. Ballod

NPUST (GSI-Taiwan)

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Morne Breytenbach/Piet Meyer
PRS Mediterranean Ltd.
Arik Nagler
Jones Edmunds, Inc.
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IN THE NEXT ISSUE

- Activities of the GSI Directors and Board
- Overview of GRI (Research) Projects
- Activities within GII (Information)
- Progress within GEI (Education)
- Activities within GAI (Accreditation)
- Activities within GCI (Certification)
- The GSI Affiliate Institutes
- The GSI Centers-of-Excellence
- Items of Interest
- Historical Perspectives on GRI's Polyolefin Specifications
- GSI's Member Organization