Yegian, M.K., Yee, Z.Y., and Harb, J.N. [1995]. "Seismic Response of Geosynthetic/Soil Systems," In: *Geoenvironment 2000*, ASCE Geotechnical Special Publication No. 46, Vol. 2, pp. 1113-1125.

Yegian, M.K. and Kadakal, U. [1998a]. "Modeling Geosynthetic Liners in Dynamic Response Analysis of Landfills," *Geotechnical Earthquake Engineering and Soil Dynamics III*, ASCE Geotechnical Special Publication No. 75, Vol. 2, pp. 986-992.

Yegian, M.K. and Kadakal, U. [1998b]. "Geosynthetic Interface Behavior under Dynamic Loading," *Geosynthetics International*, Vol. 5, Nos. 1-2, pp. 1-16.

Yegian, M.K., Harb, J.N., and Kadakal, U. [1998]. "Dynamic Response Analysis Procedure for Landfills with Geosynthetic Liners," *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, Vol. 124, No. 10, pp. 1027-1033.

Zekkos, D., Bray, J.D., Riemer, M., Kavazanjian, E., and Athanasopoulos, G.A. [2007]. "Response of Municipal Solid-Waste from Tri-Cities Landfill in Triaxial Compression," Proc, *Sardinia '07* - 11th International Waste Management and Landfill Symposium, Cagliari, Italy (CD ROM).

Zekkos, D. P., Bray, J. D., Stokoe, K. H., II., Kavazanjian, E., Rathje, E., Athanasopoulos, G.A Riemer, M., Matasovic, N., Lee, J. J., and Seos, B. [2008]. "Recent Findings on the Static and Dynamic Properties of Municipal Solid Waste," In: *Geotechnics of Waste Management and Remediation*, ASCE Geotechnical Special Publication No. 177, pp. 176-183.

Zhu, M., Kulasingam, R., Beech, J., and Brussel, L. [2010]. "Modeling Stability of Stacked Geotextile Tubes," Proc. *Geo Florida 2010*, West Palm Beach, Florida, ASCE, CD ROM Paper 59, 9 p.

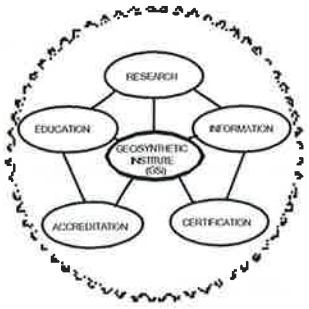
Geosyntec
consultants

Attachment C-1

TRI Environmental Inc. (Geosynthetic and Interface Testing)

EXHIBIT B to Consultant Agreement

ACCREDITED GEOSYNTHETICS LABORATORIES
9063 Bee Caves Rd., Austin, TX 78733, United States
ph: 512 263 2101 (800 880 8378), fax: 512 263 2558
www.GeosyntheticTesting.com



2008 Statement of Qualifications Geosynthetics Services

TRI is a full service geosynthetics testing laboratory, unaffiliated with any other engineering/design, manufacturing, installation or distribution firm. TRI has been servicing the geosynthetics industry for over twenty years. In the context of geosynthetics and construction quality assurance (CQA) project work, TRI provides support in the following ways.

SERVICE AREAS

- **In-plant Sampling and Inspection Services**

  While traditional quality assurance programs have involved on-site sampling of product rolls after they arrive, they have often resulted in expensive delays and costly corrections when subsequent testing identifies non-conforming product rolls. TRI was the first to revolutionize this approach by establishing in-plant manufacturing quality assurance (MQA) inspection and sampling services in the locations of product manufacture. These services are now established in the following cities and geosynthetic plants.

Location	Inspection/Sampling for
Houston, Tx.	GSE Lining Company
Kingstree, SC.	GSE Lining Company
Grand Prairie, Tx.	PolyFlex
Georgetown, SC	AGRU America
Greenville, SC	South East Manufacturers (Skaps, Tensar, Newvown)
Evergreen, AL	Tenax Corporation
Lovell, WY	CETCO
Baltimore, MY	Tenax Corporation
Fairmount, GA	CETCO
Barrie, Canada	GSE - BentoFix
Spearfish, SD	GSE - Gundseal
Varennes, Canada	SOLMAX

TRI provides two levels of service in this regard.

1) Client selects product rolls from planned production lists or actual product roll lists. TRI then independently samples these product rolls at the plant for testing.

2) Armed with the site-specific material sampling frequency, TRI selects product rolls in compliance with the required frequency and tests accordingly.

TRI's in-plant services are established in the host-city of the manufacturer of interest, thus eliminating the need for sponsors to pay for travel and lodging costs traditionally associated with MQA inspection and sampling events.

- **Geosynthetics Conformance/Verification Testing and Laboratory Accreditation**

TRI's geosynthetics laboratories and governing quality assurance system are accredited by the Geosynthetics Accreditation Institute (GAI). TRI is proud to be the first testing laboratory to achieve this accreditation, and is currently distinguished as holding the most comprehensive (117 tests) accreditation in the world. TRI has been testing and evaluating geosynthetics materials for over twenty years and has earned a superior reputation as an internationally acclaimed, highest quality testing and research facility. Our staff are active on ASTM's Committee D35 and ISO Committee TC221 for geosynthetics testing, and assure the most up-to-date, state-of-the-art testing systems and standard operating procedures for all sponsored work.

Various test hardware to support this laboratory's activities includes:

- a 150,000-pound capacity Instron Universal Testing Machine;
- a 600 kN (135,000-pound)capacity long extension Instron model 5889 testing machine equipped with Merlin Series IX "Smart-Data" acquisition system
- a 22,000-pound Instron Servo-Hydraulic Testing Machine with various direct-mounting extensometers;
- a 150 kN (35,750-pound) capacity Instron Model 5583 testing machine equipped with Merlin Series IX "Smart-Data" acquisition system;
- a 5 kN (1,125-pound) capacity Instron Model 5565 testing machine equipped with Merlin Series IX "Smart-data" acquisition system;
- fixturing and support apparatus for diversified materials testing;
- a 10,000-pound United Testing screw-driven testing machine equipped with "Datum" data acquisition system;
- 3 five station five-500-pound load cell, screw-driven testing machines equipped with automatic data acquisition software to test multiple seam samples concurrently;
- load cells and instrumentation for the above with the capability to measure 1 g - 100,000 lbs in tension or compression;
- durometer hardness testers;
- microtome precision cutting apparatus;
- Mullen Model A burst tester with 2,500 psi capability;
- hydrostatic resistance test apparatus;
- constant and falling head permittivity apparatus;
- 5 hydraulic transmissivity test apparatus;
- GeoTac hydraulic conductivity test apparatus;
- IBM-PC compatibles equipped with a variety of interfacing, networking and software capability.

- **Destructive Seam Testing During Installation**

During geomembrane installation, most CQA plans include third party destructive seam testing to assure the quality of the welds. TRI may provide this service at a competitive cost and rapid turnaround time. All **results of destructive seam tests are provided the same day as sample receipt** via facsimile with hard copies mailed the next day. At the end of the project a complete summary of all results is provided for project records. TRI also provides seam forensic capabilities to assist the project if and when any problems are encountered with dirty seams or welds marked by too much or insufficient heat, bad alignment, etc. We may provide microtomes and photographs of observations to assist you in responding appropriately to any quality assurance issue.

- **Interface Friction/Direct Shear and Related Performance Testing**

TRI laboratories perform a variety of performance testing services to support design verification and confirmation of material performance properties. This testing includes interface friction/direct shear testing to investigate slope stability as well as hydraulic conductivity for geosynthetic clay liner materials. TRI employs 10 interface friction boxes facilitating a superb testing turnaround time for the determination of slope stability behavior. We also maintain traditional geotechnical testing capabilities via pinhole dispersion, California bearing ratio, and one-dimensional consolidation. Pinhole dispersion testing provides TRI with capabilities to test for dispersive clays that could be used in earthen dams and levees. California bearing ratio enables TRI to determine subgrade suitability for roads and parking lots. One-dimensional consolidation allows TRI to estimate settlements of earthen structures such as dams and soft soils, which are subject to large overburden pressures. With these test procedures combined with routine triaxial shear strength testing and extensive soil hydraulic conductivity testing, TRI provides all of the testing needed to support major earthwork projects involving geosynthetics.

Also included are durability testing services such as long-term creep and stress-rupture testing, long-term transmissivity, clogging potential, UV resistance, oxidation and hydrolysis resistance, and other related performance evaluations. TRI staff are well versed in design issues and assist our customers in developing and performing responsive performance testing programs.

- 11 direct shear/interface friction apparatus (12" box; 3-1/2" depth; GeoDurham);
- Environmental chambers and forced air/convection ovens for oxidation resistance testing.
- Q-Panel and Atlas Weatherometers for Xenon arc and QUV ultraviolet light chambers for UV resistance testing.
- Large-scale connection and pull-out test apparatus for testing coefficient of interactions and connection strengths supportive of reinforcement design;
- Long term tension creep/stress rupture test apparatus for conventional characterization of creep reduction factors
- Elevated temperature tension creep/stress rupture test apparatus for accelerated characterization of creep reduction factors. This equipment includes capacity for performance of the Stepped Isothermal Method (SIM).
- gradient ratio and biological clogging test apparatus;
- notched constant load test apparatus capable of testing up to 120 specimens;
- multi-axial tension and large scale hydrostatic puncture test apparatus;
- Full-scale laboratory soils testing equipment (Atterburg limits, grain size, proctor compaction, consolidation, tri-axial shear, permeability, CBR, etc).
- Analytical chemistry equipment (digestion, titration and viscosity apparatus) necessary for molecular weight and carbonyl end group testing of polyester based geogrids.

- **Research and Development of New Geosynthetic Products**

As an independent third party testing facility, TRI is well known for its capability to perform advanced research and development but at a high level of confidentiality. As new geosynthetic products are introduced into the market, their relative performance characteristics are tested and evaluated in the context of product development and definition.

- **Forensics and Failure Analysis**

TRI maintains a broad capability to evaluate the microstructural properties of geosynthetic materials. This capacity, in concert with our performance testing capability, is often employed to investigate the cause for geosynthetic seaming problems or geosynthetic material failures. Senior technical staff bring their experience to bear on specific technical challenges encountered as geosynthetic materials are installed. Forensic investigation is also called upon when new and/or unknown materials are evaluated, or where premature field failures have occurred.

- **Specification Review and Product Selection**

Within the geosynthetics industry, there is all too often a tendency to mis-specify or over-specify a geosynthetic material. Problems in material specifications often result in an apparent "failure" in material even though the material was never appropriate for the application. Wasted money is often spent on mis-applied materials or laboratory testing that provides no benefit in the context of material quality verification or investigation. In the worst cases, irrelevant specifications often lead to expensive delays in material acquisition and installation.

TRI's technical staff review geosynthetic material specifications to assure their relevancy to the material for which they exist. When product selection questions are defined, TRI's staff assist the client in comparing candidate materials and in formulating responsive testing programs. In addition, TRI staff help develop specifications where none exist or where a new material is proposed for application. Through this work, TRI staff have saved significant money and time for our clients.

- **Training Services**

To assist our clients in maintaining their awareness of continual industry developments, TRI staff routinely provide lectures, workshops and short courses designed to focus on various aspects of geosynthetic materials, testing and specifications. Professional Development Hours (PDHs) are offered for most course offerings. Currently, the following short courses are provided.

The Testing and Specification of Geomembranes
Slope Stability and Interface Friction Testing
The Performance of Site-Specific Liner Integrity Surveys
The Design, Testing and Specification of Geocomposite Drains
`GSI CQA Technician Certification - Exam Preparation Course

Accreditation for Liner Integrity Surveys
Green Engineering Using Rolled Erosion Control Products

WEB-SITE AND DATA REPORTING

TRI provides resource information and client reports in client-confidential files on our website:

www.GeosyntheticTesting.com

TRI clients, and their authorized contacts have free use of this web-site via TRI provision of a user-name and password. In addition to faxing and e-mailing completed laboratory test reports, these individual project reports are posted to our web-site for access by all authorized parties. The project-specific data report files are filed by project name making access easy and immediate, facilitating final report download at any time. TRI accreditation documentation, TechNotes (providing answers to typically asked questions), and Test Request Forms are also provided for downloading. In addition, an up-to-date listing of test standards and procedures, to assist in specification development and review, is provided.

TRI appreciates your interest and values each opportunity to serve you. As always, please call if we may answer any questions or provide any additional information (**1-800-880-8378**) or E-mail me at SAllen@tri-env.com.

Sam Allen
Geosynthetics Services
TRI/Environmental, Inc.
9063 Bee Caves Road
Austin, Texas 78733, USA
SAllen@tri-env.com
512 263 2101
800-880-8378
fax: 512 263 2558

Accreditation #:
GAI-LAP - 01 - 1995
TEL (610) 522-8440

Geosynthetic Institute
475 Kedron, Ave.
Folsom, PA 19033

TRI Environmental , Inc.

is granted accreditation
for designated geosynthetic test methods in accordance with the
Geosynthetic Accreditation Institute - Laboratory Accreditation Program
(GAI-LAP), as published in its annual directory.
This accreditation is valid until June 30, 2010.

Robert M. Koerner, Ph.D., P.E.
Director

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

Geosynthetic Institute
475 Kedron Avenue
Folsom, PA 19033-1208 USA
TEL (610) 522-8440
FAX (610) 522-8441

Mr. Richard Lacey
TRI/ Environmental Inc.
9063 Bee Caves Road
Austin, TX 78733-6201

Re: GAI-LAP Accreditation

Dear Mr. Lacey,

The Geosynthetic Institute (GSI) is pleased to acknowledge TRI/ Environmental Inc. on its repertoire of Geosynthetic Accreditation Institute's-Laboratory Accreditation Program (GAI-LAP) accredited tests. This letter should serve as notification that TRI/ Environmental Inc. located in Austin, TX is currently accredited for the following one hundred and eighteen test methods until June 30, 2010.

1. ASTM D413 Test Methods for Rubber Property — Adhesion to Flexible Substrate
2. ASTM D570 Test Method for Water Absorption of Plastics
3. ASTM D638 Test Method for Tensile Properties of Plastics
4. ASTM D696 Test Method for Coefficient of Linear Thermal Expansion of Plastics
5. ASTM D746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
6. ASTM D751 Test Methods for Coated Fabrics (thickness), (mass/unit area), (tongue tear), (grab), (hydrostatic resistance) and/or (bonded seam strength)
7. ASTM D790 Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
8. ASTM D792 Test Method for Specific Gravity (Relative Density) and Density of Plastics by Displacement
9. ASTMD882 Test Methods for Tensile Properties of Thin Plastic Sheeting (strip tensile)
10. ASTM D1004 Test Method for Initial Tear Resistance of Plastic Film and Sheeting
11. ASTM D1203 Test Method for Volatile Loss from Plastics Using Activated Carbon Methods
12. ASTM D1204 Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature
13. ASTM D1238 Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer
14. ASTM D1388 Test Method for Stiffness of Fabrics

15. ASTM D1505 Test Method for Density of Plastics by the Density-Gradient Technique
16. ASTM D1593 Specification for Nonrigid Vinyl Chloride Plastic Sheeting (thickness)
17. ASTM D1603 Test Method for Carbon Black in Olefin Plastics
18. ASTM D1621 Test Method for Compressive Properties of Rigid Cellular Plastics
19. ASTM D1693Test Method for Environmental Stress-Cracking of Ethylene Plastics
20. ASTM D1777 Test Method for Measuring Thickness of Textile Materials
21. ASTM D1987 Test Method for Biological Clogging of Geotextile or Soil Geotextile Filters
22. ASTM D2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings
23. ASTM D2136 Test Method for Coated Fabrics-Low Temperature Bend Test
24. ASTM D2240 Test Method for Measuring Durometer Hardness
25. ASTM D2412 Test Method for Determination of the External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
26. ASTM D2444 Test Method for Determination of the Impact Resistance of Thermoplastic Pipe Fittings by Means of a Tup (Falling Weight)
27. ASTM D3015 Standard Practice for Microscopic Examination of Pigment Dispersion in Plastic Compounds
28. ASTM D3030 Test Method for Volatile Matter (Including Water) of Vinyl Chloride Resins
29. ASTM D3083 Standard Specification for Flexible Poly (Vinyl Chloride) Plastic Sheeting for Pond, Canal, and Reservoir Lining, (soil burial), (water extraction) and/or (bonded seam strength)
30. ASTM D3350 Specification for Polyethylene Plastic Pipe and Fittings Materials
31. ASTM D3776 Test Method for Mass Per Unit Area (Weight) or Woven Fabric
32. ASTM D3786 Test Method for Hydraulic Burst Strength of Knitted Goods and Nonwoven Fabrics (Diaphragm Bursting Strength Tester Method)
33. ASTM D3895 Test Methods for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry
34. ASTM D4218 Test Method for Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique
35. ASTM D4355 Test Method for Determination of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
36. ASTM D4491 Test Methods for Water Permeability of Geotextiles by Permittivity
37. ASTM D4533 Test Method for Index Trapezoidal Tearing Strength of Geotextiles
38. ASTM D4595 Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method
39. ASTM D4603 Test Method for Determining Inherent Viscosity of Poly (Ethylene Terephthalate) (PET)
40. ASTM D4632 Test Method for Grab Breaking Load and Elongation of Geotextiles
41. ASTM D4716 Test Method for Determining the (In-Plane) Flow Rate per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head
42. ASTM D4751 Test Method for Determining Apparent Opening Size of a Geotextile
43. ASTM D4833 Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products

44. ASTM D4884 Test Method for Seam Strength of Sewn Geotextiles
45. ASTM D4885 Test Method for Determining Performance Tensile Strength of Geomembranes Using Wide Strip Testing
46. ASTM D4886 Test Method for Abrasion Resistance of Geotextiles (Sand Paper/Sliding Block Method)
47. ASTM D5035 Test Method for Breaking Strength and Elongation of Textile Fabrics (Strip Method)
48. ASTM D5101 Test Method for Measuring the Soil-Geotextile System Clogging Potential by the Gradient Ratio
49. ASTM D5199 Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes
50. ASTM D5261 Test Method for Measuring Mass per Unit Area of Geotextiles
51. ASTM D5262 Test Method for Evaluating the Unconfined Tension Creep Behavior of Geosynthetics
52. ASTM D5321 Test Methods for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method,
53. ASTM D5322 Standard Practice for Immersion Procedures for Evaluating the Chemical Resistance of Geosynthetics to Liquids
54. ASTM D5323 Determination of 2% Secant Modulus for Polyethylene Geomembranes
55. ASTM D5397 Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes using Notched Constant Tension Load Test
56. ASTM D5493 Test Method for the Permittivity of Geotextiles Under Load
57. ASTM D5494 Test Methods for the Determination of Pyramidal Puncture Resistance of Unprotected and Protected Geomembranes
58. ASTM D5514 Test Method for Large Scale Hydrostatic Puncture Testing of Geosynthetics
59. ASTM D5596 Test Methods for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
60. ASTM D5617 Test Methods for Multi-Axial Tension Test for Geosynthetics
61. ASTM D5721 Standard Practice for Air-Oven Aging of Polyolefin Geomembranes
62. ASTM D5818 Standard Practice for Obtaining Samples of Geosynthetics from a Test Section for Assessment of Installation Damage
63. ASTM D5884 Test Method for the Tearing Strength of Internally Reinforced Geomembranes
64. ASTM D5885 Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Scanning Calorimetry
65. ASTM D5887 Standard Test Method for Measurement of Index Flux Through Saturated Geosynthetic Clay Liners Specimens Using a Flexible Wall Permeameter
66. ASTM D5890 Standard Test Method for Swell Index of Clay Mineral Component of Geosynthetic Clay Liners
67. ASTM D5891 Standard Test Method for Fluid Loss of Clay Component of Geosynthetic Clay Liners
68. ASTM D5993 Test Method for Measuring the Mass Per Unit Area of GCL
69. ASTM D5994 Test Method for Measuring the Core Thickness of Textured Geomembranes

70. ASTM D6140 Test Method for Determine of Asphalt Retention of Paving Fabrics Used in Asphalt Paving for Full Width Applications
71. ASTM D6214 Test Method for Determining the Integrity of Field Seams Used in Joining Geomembranes by Chemical Fusion Methods
72. ASTM D6241 Test Method for the Static Puncture Strength of Geotextiles and Geotextile Related Products Using a 50-mm Probe
73. ASTM D6243 Test Method for Determine the Internal and Interface Shear Resistance of Geosynthetic Clay Liners by the Direct Shear Method
74. ASTM D6364 Test Method for Determining the Short-Term Compression Behavior of Geosynthetics
75. ASTM D6392 Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods
76. ASTM D6454 Standard Test Method for Determining the Short-Term Compression Behavior of Turf Reinforcement Mats (TRMs)
77. ASTM D6475 Test Method for Measuring Mass Per Unit Area of Erosion Control Blankets
78. ASTM D6496 Test Method for Determining the Average Bonding Peel Strength Between Top and Bottom Layers of Needle-Punched Geosynthetic Clay Liners
79. ASTM D6524 Test Method for Measuring Resiliency of Turf Reinforcement Mats (TRMs)
80. ASTM D6525 Test Method for Measuring Nominal Thickness of Permanent Erosion Control Products
81. ASTM D6566 Test Method for Measuring Mass per Unit Area of Turf Reinforcement Mats (TRMs)
82. ASTM D6567 Test Method for Measuring Light Penetration of Turf Reinforcement Mat (TRM)
83. ASTM D6574 Test Method for Determining the In-plane Hydraulic Transmissivity of a Geosynthetic by Radial Flow
84. ASTM D6575 Test Method for Determining Stiffness of Geosynthetics used as Turf Reinforcement Mats
85. ASTM D6636 Test Method for Determination of Ply Adhesion Strength of Reinforced Geomembranes
86. ASTM D6637 Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method
87. ASTM D6638 Test Method for Determining Connection Strength Between Geosynthetic Reinforcement and Segmental Concrete Units (Modular Concrete Blocks)
88. ASTM D6693 Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreiforced Flexible Polypropylene Geomembranes
89. ASTM D6706 Test Method for Determining Pull-Out Resistance of Geosynthetics
90. ASTM D6766 Test Method for Evaluation of Hydraulic Properties of Geosynthetic Clay Liners Permeated with Potentially Incompatible Liquids
91. ASTM D6768 Test Method for Tensile Strength of Geosynthetic Clay Liners
92. ASTM D6818 Test Method for Ultimate Tensile Properties of Turf Reinforcement Mats

93. ASTM D6992 Test Method for Time-Temperature Superposition Using Stepped Isothermal Method
94. ASTM D7003 Test Method for Strip Tensile Properties of Reinforced Geomembranes
95. ASTM D7004 Test Method for Grab Tensile Properties of Reinforced Geomembranes
96. ASTM D7005 Test Method for Determining the Bond Strength (Ply Adhesion) of Geocomposites
97. ASTM D7056 Test Method for Determining the Tensile Shear Strength of Prefabricated Bituminous Geomembrane Seams
98. ASTM D7101 Test Method for RECP slope
99. ASTM D7179 Test Method for Determining Geonet Breaking Force
100. ASTM D7207 Test Method for RECP shear
101. ASTM D7238 Standard Test Method for Effect of Exposure of Unreinforced Polyolefin Geomembrane Using Fluorescent UV Condensation Apparatus
102. ASTM D7272 Test Method for Determining the Integrity of Seams Used in Joining Geomembranes by Pre-manufactured Taped Methods
103. ASTM D7275 Test Method for Tensile Properties of Bituminous Geomembranes (BGM)
104. ASTM D7322 Test Method for RECP germination
105. ASTM D7361 Test Method for Compressive SIM
106. ASTM D7406 Test Method for Time-Dependent (Creep) Deformation Under Constant Pressure for Geosynthetic Drainage Products
107. ASTM D7409 Test Method for CEG of PET
108. ASTM D7466 Test Method for Asperity Height
109. ASTM E96 Test Method for Water Vapor Transmission of Materials
110. ASTM F904 Test Method for Comparison of Bond Strength or Ply Adhesion of Similar Laminates Made from Flexible Materials
111. ASTM F1473 Test Method for Notched Tensile Test to Measure the Resistance to Slow Crack Growth of Polyethylene Pipes and Resins
112. ASTM F2136 Test Method for Notched, Constant-Ligament-Stress (NCLS) Test to Determine Slow Crack-Growth Resistance of HDPE Resins and HDPE Corrugated Pipe
113. FTM STD. No. 101c (method 2065-82), Puncture Resistance and Elongation Test (1/8 in. radius probe)
114. GRI GG-1 Geogrid Rib Tensile Strength
115. GRI GG-2 Geogrid Junction Strength
116. GRI GG-7 Carboxyl End Group Content of PET Yarns
117. GRI GG-8 Determination of the Number Average Molecular Weight of PET Yarns Based on Relative Viscosity Value
118. GRI GM-11 Accelerated Weathering of Geomembranes Using a Fluorescent UVA Device
119. GRI GS-7 Determining the Index Friction Properties of Geosynthetics
120. ISO 527 Plastics – Determination of Tensile properties – Part 3: Test conditions for films and sheets
121. ISO 9864 Geotextiles - Determination of mass per unit area

122. ISO 10319 Geotextiles - Wide width tensile test
123. ISO 10722 Geotextiles and geotextiles - related products – Procedure for simulating damage during installation Part 1: Installation in granular materials
124. ISO 12236 Geotextiles and geotextiles - related products – Static puncture test (CBR test)
125. ISO 12956 Geotextiles and geotextiles - related products – Determination of the characteristic opening size
126. ISO 12957 Geosynthetics – Determination of friction characteristics Part 1: Direct shear test, Part 2: Inclined plane test
127. ISO 12958 Geotextiles and geotextiles - related products – Determination of water flow capacity in their plane
128. ISO 12960 Geotextiles and geotextiles - related products – Screening test method for determining the resistance to liquids
129. ISO 13426 Geotextiles and geotextiles - related products – Strength of internal structural junctions – Part 1: Geocells Part 2: Geocomposites
130. ISO 13431 Geotextiles and geotextiles – related products - Determination of the tensile creep and creep rupture behavior
131. ISO 13438 Geotextiles and geotextiles - related products – Screening test method for determining the resistance to oxidation
132. ISO 13939 Geotextiles and geotextiles - related products – Screening test method for determining the resistance to hydrolysis

Any questions regarding your accreditation should be directed to George or Robert Koerner at (610) 522-8440. Once again congratulation and thank you for participating in the GAI-LAP.

Best Regards,

George R. Koerner, Ph.D., P.E. & CQA
Director Designate

Geosyntec consultants

Attachment C-2

Excel Geotechnical Testing Laboratory

OVERVIEW

Excel Geotechnical Testing (EGT) Laboratory is a geo-environmental/geotextile testing laboratory founded in 2000 in the State of Georgia. The Laboratory is located in Roswell, a suburb of Atlanta, and is managed and operated by Dr. Nader S. Rad, P.E. who has more than 25 years of experience in laboratory testing. Dr. Rad is a recognized authority in the area of laboratory and field testing and has published more than 30 technical papers in this area including State of the Art Paper presented in XII International Conference in Soil Mechanics and Foundation Engineering.

This Statement of Qualifications (SOQ) has been prepared to briefly describe testing and research capabilities of EGT Laboratory, and is organized as follows:

- Organizational Profile;
- Testing Capabilities;
- Prior Experience;
- Quality Assurance/Quality Control;
- Health and Safety;
- Affiliations; and
- Contact Information.

ORGANIZATIONAL PROFILE

EGT Laboratory's mission statement is to provide high quality testing services in the most cost and time effective manner possible for its clients.

EGT was established in the spring of 2000 and is located in Roswell, a suburb of Atlanta. The laboratory was designed to meet, in addition to standard geotechnical testing requirements, the testing needs anticipated for feasibility study, remedial design and cleanup implementation phases of hazardous waste management programs, as well as geosynthetic testing.

EGT is managed and operated by Dr. Nader S. Rad, P.E., who is committed to providing high quality state-of-the-art testing services to the industry. Dr. Rad has more than 25 years of experience both in the laboratory and in the field and under his supervision the laboratory is capable of meeting the highest standards of quality.

EGT is subdivided into the following four program areas:

- Geotechnical Testing Program, including conventional testing such as index, compression, strength, and hydraulic conductivity;
- Environmental Testing Program, including bench-scale processing, stabilization/ solidification, treatability studies, and cutoff-wall mix designs;
- Geosynthetic Testing Program, including conventional testing such as strength testing of geomembranes and geotextiles; and
- Special Testing Program, including specifically designed geotechnical, geo-environmental and geosynthetic testing programs.

Performing Research and Development (R&D) projects are encouraged at EGT, and are a significant factor in maintaining a technological leadership role.

Stringent policies, under direct supervision of Dr. Rad, are maintained throughout EGT regarding quality assurance/quality control, health and safety practices, and client/project/product confidentiality. In fact, EGT strictly conforms to all clients' confidentiality requirements. Neither the scope of testing programs, nor the results of any tests are disclosed to any parties outside of EGT without written permission of the client.

TESTING CAPABILITIES

Geotechnical Testing Program

The Geotechnical Testing Program was established to provide conventional and specialized testing of all types of soils and geosynthetic clay liners to establish their engineering properties (physical, mechanical, and hydraulic properties) for design and construction-related purposes. Some of the testing services performed within the Geotechnical Testing Program are presented below.

Conventional Geotechnical Testing

Soil Index and Compaction Testing

- Sieve Analysis
- Hydrometer Analysis
- Atterberg Limits Analyses
- Organic Content
- Carbonate Content of Aggregates
- Standard and Modified Proctor Tests
- Maximum Density Test
- Minimum Density Test
- Soil pH Test

Soil Strength and Compressibility Testing

- Unconfined Compression Test
- Unconsolidated-Undrained (UU) Triaxial Compression Test
- Consolidated-Undrained (CU) Triaxial Compression Test
- Consolidated-Drained (CD) Triaxial Compression Test
- One-Dimensional Consolidation Test
- One-Dimensional Swell Potential

Soil Permeability Testing

- Hydraulic Conductivity of Fine-Grained Soils
- Hydraulic Conductivity of Granular Soils

Specialized Geotechnical Testing

Soil Dispersion Testing

- Pinhole Dispersion Evaluation
- Double Hydrometer Dispersion Potential

Geosynthetic Clay Liner Testing

- Permeability of Geosynthetic Clay Liners
- Index Flux
- Thickness measurement
- Mass per Unit Area
- Free Swell of Bentonite Clay
- Filtrate Loss

Soil Permeability Evaluations

- Moisture - Unit Weight - Hydraulic Conductivity Relationship
- Capillary-Moisture Relationships for Coarse- and Medium-Textured Soils
- Capillary-Moisture Relationships for fine textured soils
- Freeze-Thaw Tests
- Desiccation Tests

Barrier Wall Mix Design

- Soil Bentonite Mix Design
- Soil Bentonite Cement Mix Design
- Marsh Funnel Viscosity
- Filter Press Loss
- Slurry Unit Weight

Environmental Testing Program

The Environmental Testing Program was established to provide testing of contaminated soils, treated sludge, stabilized/solidified materials, and solid-waste materials. Chemical compatibility tests, leachability evaluations, stabilization/solidification and other treatability studies represent some of the testing services performed at the laboratory. Some of the testing services performed within the Environmental Testing Program are presented below.

Contaminated Soil and Waste Testing

Material Index and Compaction Testing

- Sieve Analysis
- Hydrometer Analysis
- Atterberg Limits Analyses
- Standard and Modified Proctor Tests

Permeability Related Testing

- Hydraulic Conductivity of Fine-Grained Soils
- Hydraulic Conductivity of Granular Soils
- Moisture – Unit Weight – Hydraulic Conductivity Relationship
- Effective Porosity/Breakthrough Evaluation

Material Strength and Compressibility Testing

- Unconfined Compression Test
- Unconsolidated-Undrained (UU) Triaxial Compression Test
- Consolidated-Undrained (CU) Triaxial Compression Test
- Consolidated-Drained (CD) Triaxial Compression Test
- One-Dimensional Consolidation Test
- One-Dimensional Swell Potential

Soil Dispersion Testing

- Pinhole Dispersion Evaluation
- Double Hydrometer Dispersion Potential

Treatability Studies

- Soil-Washing Studies
- Soil-Gas Injection
- Contaminant Transfer
- High-pH Soil Neutralization

Leachability Testing

- Leaching Solid Waste in a Column Apparatus
- Extraction Procedure Toxicity Test
- Multiple Extraction Procedure
- Equilibrium Leach Test

Stabilization/Solidification Testing

- Unconfined Compression Test
- Consolidated-Undrained (CU) Triaxial Compression Test
- One-Dimensional Consolidation Test
- Freeze-Thaw Durability
- Wet-Dry Durability
- Paint Filter Liquids Test
- Permeability Tests (EPA 9100)

Chemical Compatibility Testing

- Permeability/Compatibility Tests (EPA 9100)
- Chemical Compatibility Tests

Geosynthetic Testing Program

The Geosynthetic Testing Program is a small portion of testing program at EGT. This program was established to provide conventional and specialized testing of various types of geosynthetic as a complementry step to other projects in the laboratory. Some of the testing services that the laboratory is capable of performing are presented below.

Conventional Geosynthetic Testing

Geomembranes Testing

- Tensile Properties
- Thickness
- Density or Specific Gravity
- Tear Resistance
- Melt Index
- Mass per Unit Area
- Seam Peel/Shear

Geotextiles Testing

- Air Permeability
- Strip Tensile
- Peel Resistance of Adhesives
- Mass per Unit Area

Geonet Testing

- Density or Specific Gravity
- Melt Index
- Compression Behavior
- Mass per Unit Area
- Thickness

Specialized Geosynthetic Testing

- Freeze/Thaw
- Permeability
- Fiber pull Out Strength
- Chemical Compatibility

Special Testing Program

The Special Testing Program was established to provide testing of soil, geosynthetics, and manufactured soil-like materials. Hydraulic testing including hydraulic property determination and composite system filtration evaluation, and specialized client defined testing represent the testing services provided. Some of the testing services performed within the Special Testing Program are presented below.

Hydraulic Testing	**Specialized Client Defined Testing**
• Filtration Testing	• Soil Extrusion Test
• Gradient Ratio Test	• Triaxial Extension Test
• Hydraulic Conductivity Ratio Test	• Long Term Triaxial Shear Test
	• Seam Permeability of GCL
	• 16" Diameter Permeability Test
	• Membrane Puncture/Permeability Test

PRIOR EXPERIENCE

GEL staff has worked on various projects for a diverse clientele. The following are representative examples of some of these projects, their descriptions and the respective client.

Project Type and Location	Project Description	Client
Solidification/ Stabilization New York	Prepared mixtures of contaminated sludge for index strength testing including triaxial compression and unconfined compression. Results were compared with pocket penetrometer, torvane, and lab vane readings for field calibration.	Camp Dresser & McKee
Soil-Bentonite Mix Design Illinois	Chemical compatibility, EPA 9100 chemical compatibility, cement-bentonite mix design, index, and workability testing.	GeoSyntec Consultants
Construction Quality Assurance Georgia	Testing for a large landfill construction project including soil index, Atterberg limits, soil classification, permeability, and compaction.	Oasis Construction
Paper Sludge Testing Ohio	Mixed additives with paper sludge to solidify for land filling. Testing included triaxial compression, and triaxial compression creep. Results were compared with pocket penetrometer and torvane readings for field calibration.	The Mead Corporation
Product Development Illinois	Testing of geosynthetic clay liners included permeability, EPA 9100 chemical compatibility, thickness, mass per unit area.	CITCO
Construction Quality Assurance Tennessee	Testing included soil index, specific gravity, Atterberg limits, permeability, and compaction.	ARCADIS
Research and Development Texas	Specialized hydraulic conductivity testing was performed on an interlocking geomembrane seam.	Confidential

EXHIBIT B to Consultant Agreement

Project Type and Location	Project Description	Client
Compatibility Testing Maryland	Clay for a landfill liner was tested for compatibility with a cyanide leachate, testing included EPA 9100 chemical compatibility, pinhole dispersion, and gradient ratio.	Eastalco Aluminum Company
Constitutive Modeling Florida	Testing included special drained triaxial compression.	United States Air Force
Construction Quality Assurance New York	Construction quality assurance testing was conducted on soil and gravel samples. Testing included soil index, specific gravity, compaction, permeability, and carbonate content.	Town of Babylon
Performance Analyses Georgia	Geosynthetic fabrics were tested using the gradient ratio and hydraulic conductivity ratio.	Nicolon Corporation
Treatability Texas	Oil contaminated sediments were solidified with various additives to simulate in-situ remediation treatment. Testing included mix design, Marsh funnel viscosity, permeability, total unit weight, unconfined compression, index shear strength, slump, and volumetric expansion.	Confidential
Construction Quality Assurance Saint Croix, USVI	Testing included soil index.	Premier Environmental Services
Soil-Bentonite Mix Design Florida	Soil Bentonite mix evaluation, chemical compatibility, Bentonite slurry evaluation, slump /workability testing.	GeoSyntec Consultants
Site Acceptability	Testing included classification, soil index, and permeability.	Ground Water & Environmental Management
Constitutive Modeling Florida	Testing included classification, soil index, compaction, and consolidated undrained triaxial compression	Stategic Engineering & Science

QUALITY ASSURANCE/QUALITY CONTROL

EGT Laboratory has established a quality assurance program which includes written policies, procedures, and guidelines for performance, documentation, and review of laboratory activities. These policies, procedures, and guidelines are revised and updated on a regular basis.

The test equipment in the laboratory undergoes regular internal, and when applicable, external calibration. When applicable, these calibrations are recorded and kept on files in the laboratory. The record for each device or system identifies the equipment, indicates the date the calibration or monitoring was performed and by whom.

All samples are delivered to the laboratory by field personnel or common carrier. Upon delivery, the samples are logged into a chronological record book by laboratory personnel. The log contains information such as date, client name, project number, and client sample identification. At this point, an EGT laboratory sample number is assigned to each sample to facilitate tracking and documentation for the remainder of the testing program. Samples are then logged in on project log sheets containing project-specific testing requirements. Afterwards, the samples are transferred to an appropriate storage area prior to specimen preparation.

Laboratory personnel prepare test specimens according to the appropriate test methods. Tests are conducted in general accordance with the United States Environmental Protection Agency (USEPA), American Society for Testing and Materials (ASTM), U.S. Army Corps of Engineers (USACOE) and/or other specified testing standards. Standardized test procedures are used unless deviations are requested by the client. In such cases, the deviation is entered on the data sheets, and/or in the final report as appropriate. The test data is either acquired by computer data acquisition systems, or by hand. In either case, the corresponding data analyses are performed by computers. The results are then tabulated and reviewed by the laboratory manager before being sent to the client.

Samples are stored for a period of 30 days after the issuance of the report or 90 days after the samples are received at the laboratories (whichever occurs first). If required, the samples are available for retesting or to be sent back to the client. Contaminated samples are sent to the client for appropriate disposal.

HEALTH AND SAFETY

EGT places a high priority on employee health and safety. All testing programs are designed to minimize the potential for exposure by employees to toxic and/or hazardous materials. A risk assessment is made of, and when appropriate, a project specific Health and Safety Plan is developed and implemented for each project. The Health and Safety Plan will inform employees of the type and the levels of contamination in the test materials, associated dangers and risks, and the appropriate level of protection required when handling or working with these materials. Testing of contaminated materials is performed solely by the laboratory manager who has vast experience in handling and testing contaminated materials.

AFFILIATIONS

The laboratory management is a member of the following professional organizations:

- American Society for Testing and Materials (ASTM);
- American Society of Civil Engineers;
- International Society for Soil Mechanics;
- Transportation Research Board; and
- Research Science council.

CONTACT INFORMATION

EGT is an independent laboratory serving a broad range of clients throughout the industry. For more information, please contact:

Dr. Nader S. Rad, P.E.

Excel Geotechnical Testing Laboratory
941 Forrest Street
Roswell, Georgia 30075
Telephone: (770) 650-1666
Telefax: (770) 650-5786

LABORATORY MANAGEMENT

Nader S. Rad, Ph.D., P.E.

Ph.D., Geotechnical Engineering, Stanford University, 1982
M.S., Geotechnical Engineering, Stanford University, 1980
B.S., Civil Engineering, Aryamehr University, 1978

Dr. Nader S. Rad is a geotechnical engineer with more than twenty five years of experience with laboratory and in situ testing of soils and rocks. He has been involved in equipment development and all aspects of laboratory testing at Stanford University, Louisiana State University, the Norwegian Geotechnical Institute (NGI), GeoSyntec Consultants, and most recently at Excel Geotechnical Testing Laboratory. Dr. Rad has been in charge of laboratory testing programs for multimillion-dollar projects in the United States, Norway, the United Kingdom, the Republic of Congo, Hong Kong and many other countries.

Since founding EGT in 2000, Dr. Rad has been in charge of numerous laboratory testing programs required as part of geotechnical investigations for various construction projects (e.g., office buildings, retaining walls, landfill construction, waste remediation, contamination removal and stabilization). Dr. Rad has extensive experience with all aspects of soil testing procedures and is in charge of execution, overall management, quality control and document review of all testing at EGT.

Dr. Rad is a member of the Transportation Research Board, National Research Council, American Society of Civil Engineers, American Society for Testing and Materials, and International Society for Soil Mechanics. He is the author or the co-author of more than 30 technical papers and 50 research reports on the subject of laboratory testing. He is a registered professional engineer.

Geosyntec consultants

Attachment D-1

2009 Presentation to State Water Boards on new NGA Models by Dr. Matasovic

NGA – A RECENT UPDATE OF GROUND MOTION ATTENUATION MODELS

Presented by:

Neven Matasovic, PhD, PE, GE

Geosyntec consultants

Huntington Beach, California

nmatasovic@geosyntec.com

to:

State Water Resources Control Board

Land Disposal Programs All Staff Roundtable

Sacramento, California

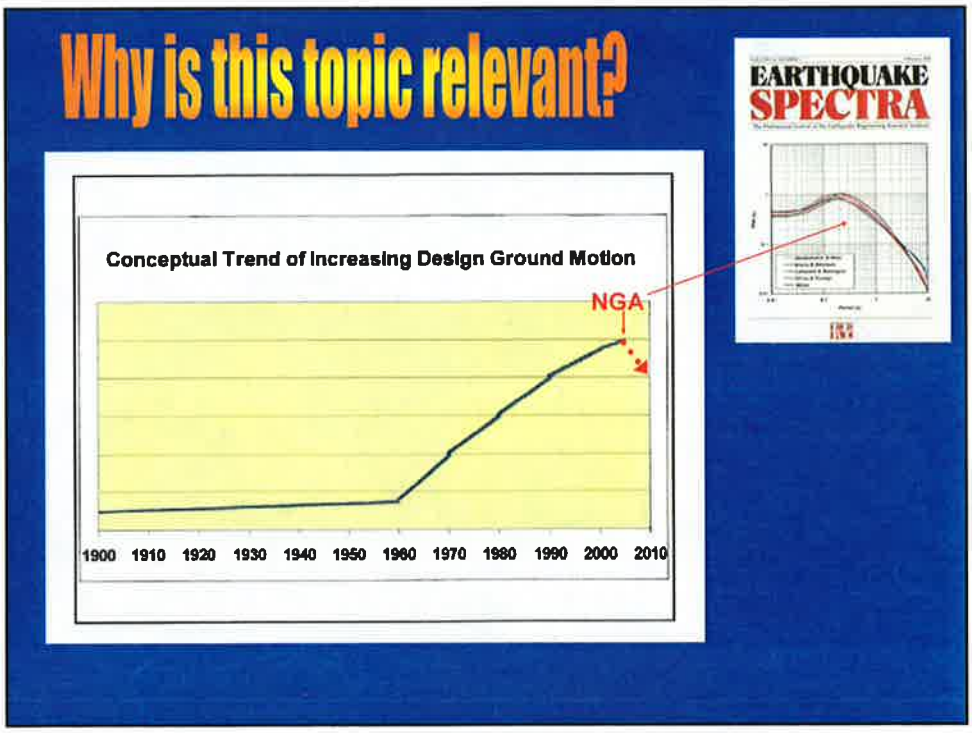
11 February 2009

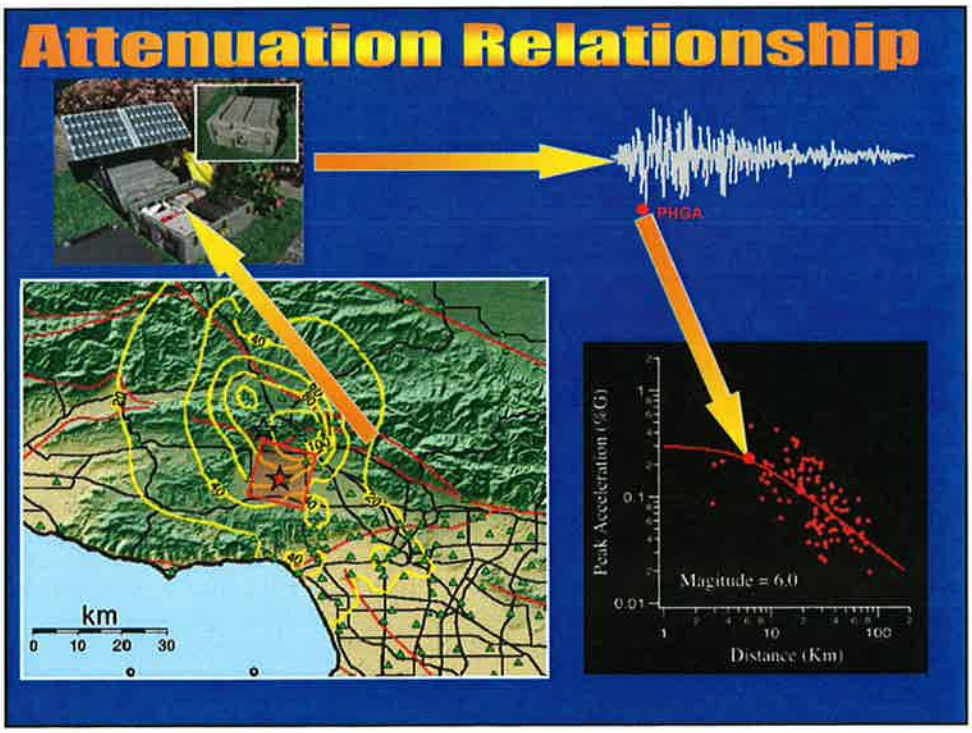
OUTLINE

- Why is this topic relevant?
- What are attenuation relationships?
- What are *input* parameters of attenuation relationships?
- What are *output* parameters of attenuation relationships?
- What do we do with the results?

⇐ INTRO

- NGA – What changed with respect to the old models and what is the basis for the change?
- What are the consequences of using NGA for landfill projects in California?
- Recommendations and Discussion


Why is this topic relevant?
Conceptual Trend of Increasing Design Ground Motion
NGA
1900 1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010
EARTHQUAKE SPECTRA


Attenuation Relationship
PHGA
km
0 10 20 30
Peak Acceleration (%G)
Magnitude = 6.0
Distance (Km)

What are input parameters?

Until 2008

- Tectonic region and fault type
- Magnitude
- Distance®
- Site Conditions (Rock or Soil)
- Special Effects (Hanging Wall)

2008 +

- All of the above + many more …

What are output (predictive) Parameters?

Peak Acceleration

Horizontal and Vertical Components

Duration

Duration of strong shaking®

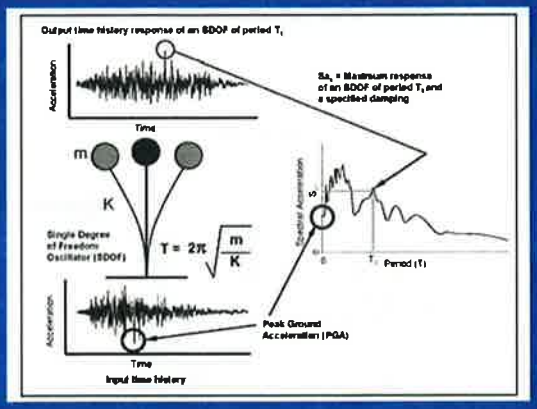
Frequency Content

Acceleration Response Spectra

Other

Newmark-type Seismically-Induced Displacements, …

Acceleration Response Spectrum

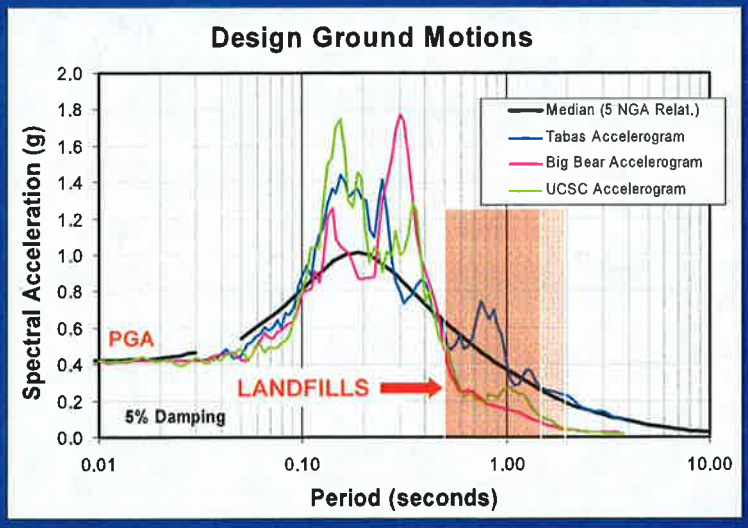


Definition:

Plot of the maximum response of many single-degree-of-freedom linear viscoelastic systems with the same damping but with different fundamental periods of vibration.

All characteristics are captured in an acceleration-time history BUT they are not captured completely by a response spectrum or by individual parameters (G. Housner).

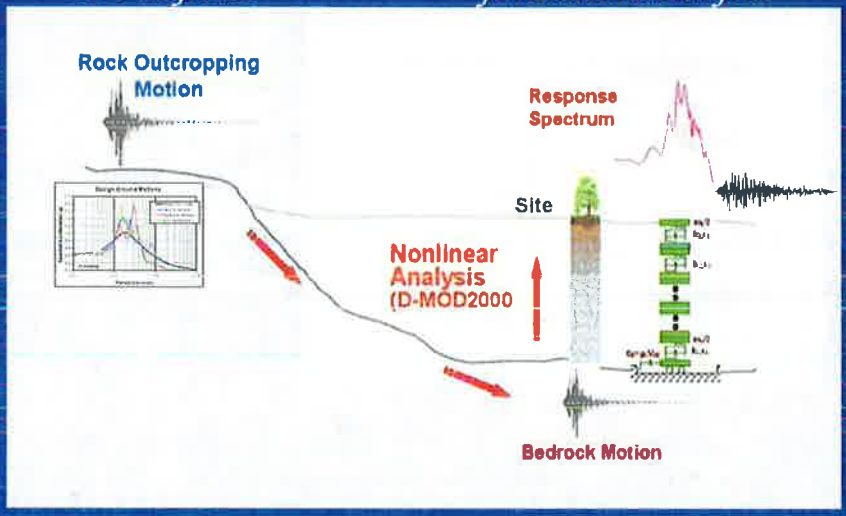
Application of Response Spectrum



Selection of suite of design ground motions

Application of Design Ground Motions

Site response and seismic deformation analyses



Nothing is more important than the input bedrock motion (J. Bray)

NGA – What Changed Since 1997?

- Number of input parameters INCREASED (dip, top of rupture, depth of rupture, width, V_{S30},$V_{S2.5}$, …);
- Number of predictive parameters INCREASED (velocity);
- Number of spec. effects included INCREASED (near-fault forward directivity; sort of site response analysis);
- Standard deviation (σ) of predictions DECREASED; and
- Complexity of the model INCREASED → higher level of problem understanding is required.

Significant duration of strong shaking models have not been updated

What is the Basis for Change?

Strong-Motion Database has Expanded:

173 Worldwide Earthquakes

(> 10,500 uniformly-processed records)

1999 Kocaeli, Turkey (M_w 7.5)

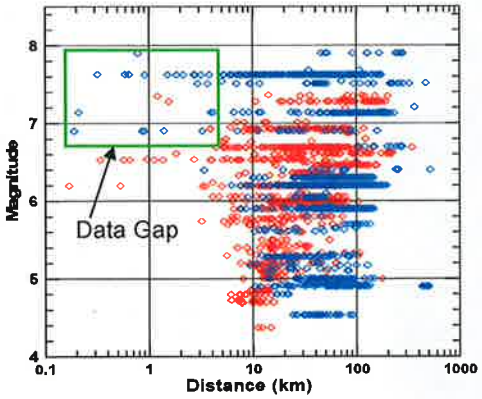
1999 Chi-Chi, Taiwan (M_w 7.6)

1999 Duzce, Turkey (M_w 7.1)

1999 Hector Mine, CA (M_w 7.1)

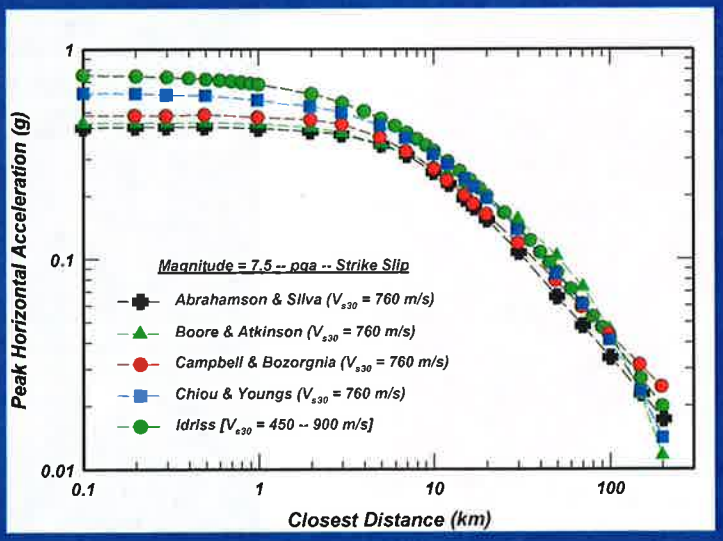
2002 Denali, Alaska (M_w 7.9)

2009 Central Italy (M_w 6.3)

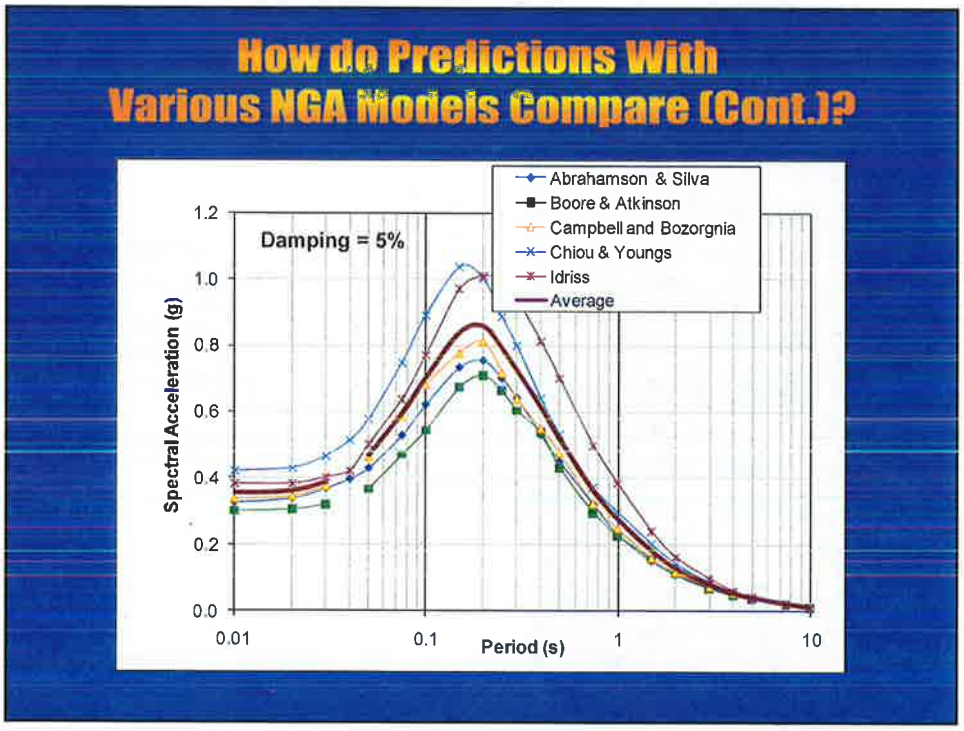


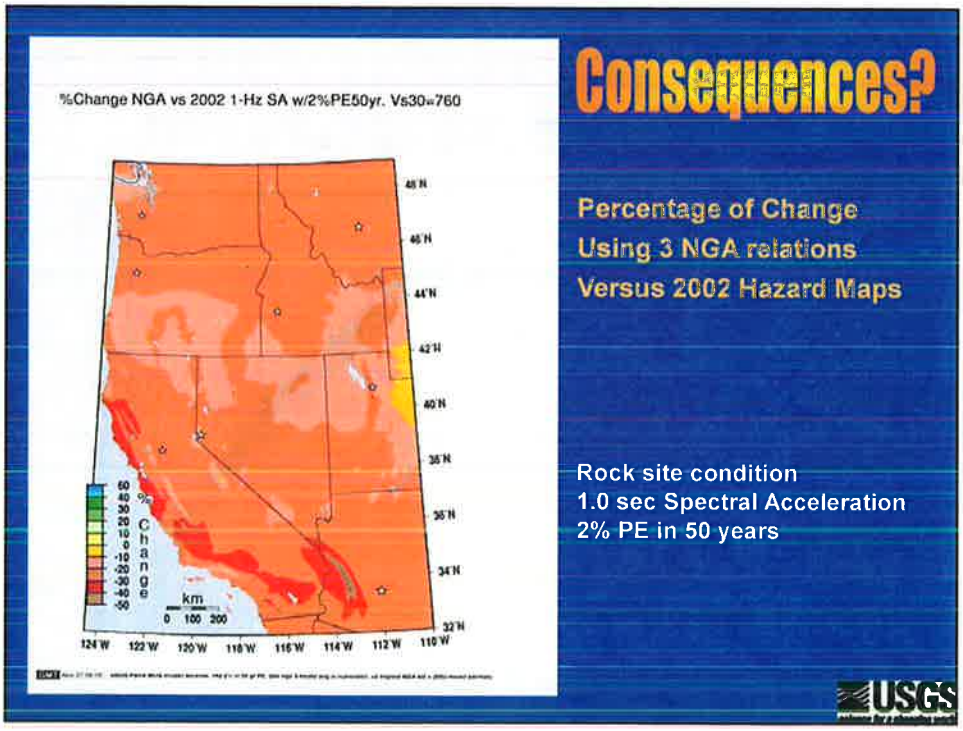
Previous Data New Data

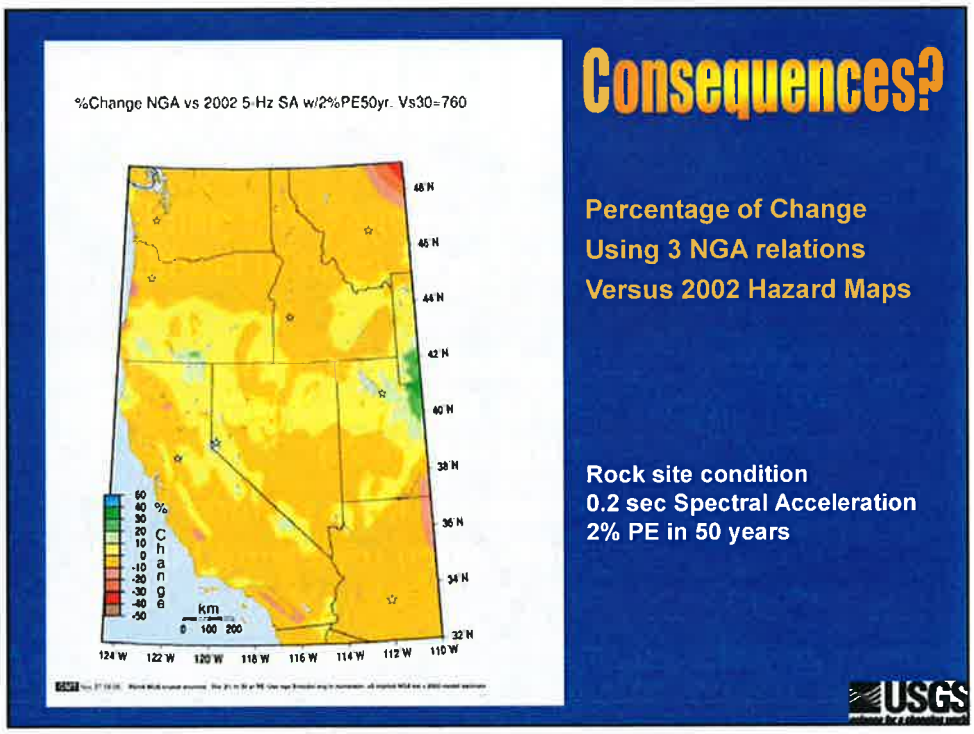
How do Predictions with Various NGA Models Compare?



PEER


How do Predictions With
Various NGA Models Compare (Cont.)?
Damping = 5%
Abrahamson & Silva
Boore & Atkinson
Campbell and Bozorgnia
Chiou & Youngs
Idriss
Average
Spectral Acceleration (g)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.01
0.1
1
10
Period (s)


%Change NGA vs 2002 1-Hz SA w/2%PE50yr. Vs30=760
% Change
km
0 100 200
48 N
46 N
44 N
42 N
40 N
38 N
36 N
34 N
32 N
124 W
122 W
120 W
118 W
116 W
114 W
112 W
110 W
Consequences?
Percentage of Change
Using 3 NGA relations
Versus 2002 Hazard Maps
Rock site condition
1.0 sec Spectral Acceleration
2% PE in 50 years
USGS



NOTE!

- When designing a landfill, under/over estimation of the material parameters can result in u_{max} over/under estimate of, say ± 30 percent
- Under/over estimation of design ground motions can result in u_{max} over/under estimate of ± 300 percent or more

u_{max} = Maximum calculated permanent seismic displacement

RECOMMENDATIONS

- NGA models matured enough and gained enough acceptance to be used in landfill design
- Design should be based upon average of 5 NGA models (USGS averages 3 NGA models for the National Hazard Maps)
- Don't hesitate to ask for Mike's (and consultants'?) help when reviewing landfill design reports

DISCUSSION

Geosyntec consultants

Attachment E-1

Workers Compensation and General Liability Insurance

EXHIBIT B to Consultant Agreement

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) 04/15/2010

PRODUCER
Marsh USA Inc.
1560 Sawgrass Corp. Pkwy, Suite 300
Sunrise, FL 33323-2858
Attn: Fax: 212-948-1306 / Contract.ReviewCSS@marsh.com

S81127-ALL-CAS1-09-10 OAKLA ALL4

THIS CERTIFICATION IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED
GEOSYNTEC CONSULTANTS, INC.
5901 BROKEN SOUND PARKWAY NW
SUITE 300
BOCA RATON, FL 33487-2775

INSURERS AFFORDING COVERAGE	NAIC #
INSURER A: Commerce And Industry Ins Co	19410
INSURER B: American International Specialty Lines Ins Co	26883
INSURER C: New Hampshire Insurance Company	23841
INSURER D: Insurance Company Of The State Of PA	19429
INSURER E:	

COVERAGES 1

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	ADD'L INSRD	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YYYY)	POLICY EXPIRATION DATE (MM/DD/YYYY)	LIMITS	
A		**GENERAL LIABILITY** X COMMERCIAL GENERAL LIABILITY CLAIMS MADE X OCCUR X DEDUCTIBLE: $100,000 GENERAL AGGREGATE LIMIT APPLIES PER: X POLICY PRO-JECT LOC	GL4178618	09/01/2009	09/01/2010	EACH OCCURRENCE DAMAGE TO RENTED PREMISES(Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ 1,000,000 $ 100,000 $ 25,000 $ 1,000,000 $ 2,000,000 $ 2,000,000
A A		**AUTOMOBILE LIABILITY** X ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS X HIRED AUTOS X NON-OWNED AUTOS	CA5053937 (AOS) CA1955451 (MA)	09/01/2009 09/01/2009	09/01/2010 09/01/2010	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ 1,000,000 $ $ $
		GARAGE LIABILITY ANY AUTO				AUTO ONLY - EA ACCIDENT OTHER THAN AUTO ONLY: EA ACC AGG	$ $ $
B		**EXCESS / UMBRELLA LIABILITY** X OCCUR CLAIMS MADE DEDUCTIBLE X RETENTION $ 10,000	UMB8085625	09/01/2009	09/01/2010	EACH OCCURRENCE AGGREGATE	$ 10,000,000 $ 10,000,000
C D		**WORKERS COMPENSATION AND EMPLOYERS' LIABILITY** ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y / N N (Mandatory in NH) If yes, describe under SPECIAL PROVISIONS below	WC6987876 (AOS) WC6987877 (CA)	09/01/2009 09/01/2009	09/01/2010 09/01/2010	X WC STATU-TORY LIMITS OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ 1,000,000 $ 1,000,000 $ 1,000,000
B		**OTHER** Prof. Liability & Contr. Poll. Liab. Claims Made Form	195-19-04	09/01/2009	09/01/2010	Each Claim / Aggregate Ded: Each Claim Incl. Prod. & Completed Ops	8,000,000 250,000

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/EXCLUSIONS ADDED BY ENDORSEMENT/SPECIAL PROVISIONS

THE COUNTY OF RIVERSIDE AND THE RIVERSIDE COUNTY WASTE MANAGEMENT DEPARTMENT AND THEIR ELECTED OR APPOINTED OFFICIALS, EMPLOYEES AND AGENTS ARE INCLUDED AS AN ADDITIONAL INSURED FOR THE GENERAL LIABILITY POLICY WHERE REQUIRED BY WRITTEN CONTRACT.

CERTIFICATE HOLDER ATL-002127113-01

COUNTY OF RIVERSIDE
14310 FREDERICK STREET
MORENO VALLEY, CA 92553

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE of Marsh USA Inc. Rosalia A. Croes
Rosalia A. Croes

ACORD 25 (2009/01)

EXHIBIT B to Consultant Agreement

IMPORTANT

If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

DISCLAIMER

This Certificate of Insurance does not constitute a contract between the issuing insurer(s), authorized representative or producer, and the certificate holder, nor does it affirmatively or negatively amend, extend or alter the coverage afforded by the policies listed thereon.

Geosyntec consultants

Attachment F-1

Cost Estimate

EXHIBIT B to Consultant Agreement

Geosyntec consultants

Attachment F-1
Cost Proposal Sheet

Service A-1: Lamb Canyon Geotechnical Services					
Task No.	Description of Work	Unit	Estimated Quantities	Unit Price	Total
TASK NO. 1 - LABORATORY TESTING FOR ON-SITE MATERIALS					
1.1	Particle Size Analysis (ASTM D422) - Eng. Fill	test	5	$ 60	$ 299
1.2	Lab. Modified Proctor -Moisture/Density (ASTM D1557) - Eng. Fill	test	10	$ 168	$ 1,680
SUBTOTAL TASK 1					**$ 1,979**
TASK NO. 2 - SUBSURFACE INVESTIGATION					
2.1	Soil Borings	feet	200	$ 53	$ 10,666
SUBTOTAL TASK 2					**$ 10,666**
TASK NO. 3 - DESIGN SELECTION					
3.1	Design Selection	Lump Sum	1	$ 3,664	$ 3,664
SUBTOTAL TASK 3					**$ 3,664**
TASK NO. 4 - STABILITY ANALYSIS					
4.1	Stability Analysis	Lump Sum	1	$ 24,186	$ 24,186
SUBTOTAL TASK 4					**$ 24,186**
TASK NO. 5 - TECHNICAL REVIEW OF CONTRACT DOCUMENT DETAILS					
5.1	Review of Project Details, Specifications Sections & CQA/QC Plan	Lump Sum	1	$ 3,664	$ 3,664
SUBTOTAL TASK 5					**$ 3,664**
Service A-1: Lamb Canyon Geotechnical Services Total Proposal (Tasks 1-5)					$ 44,159

*Overhead is approximately 231% of professional direct labor costs, and profit is approximately 11.5% of professional direct labor and overhead costs.

EXHIBIT B to Consultant Agreement

Geosyntec consultants

Attachment F-1
Cost Proposal Sheet

Service A-2: Badlands Geotechnical Services					
Task No.	Description of Work	Unit	Estimated Quantities	Unit Price	Total
TASK NO. 1 - LABORATORY TESTING FOR ON-SITE MATERIALS					
1.1	Particle Size Analysis (ASTM D422) - Eng. Fill	test	2	$ 60	$ 120
1.2	Lab. Modified Proctor -Moisture/Density (ASTM D1557) - Eng. Fill	test	2	$ 168	$ 336
SUBTOTAL TASK 1					**$ 456**
TASK NO. 2 - SUBSURFACE INVESTIGATION					
2.1	Soil Borings	feet	n/a	n/a	n/a
SUBTOTAL TASK 2					**n/a**
TASK NO. 3 - DESIGN SELECTION					
3.1	Design Selection	Lump Sum	1	$ 3,664	$ 3,664
SUBTOTAL TASK 3					**$ 3,664**
TASK NO. 4 - STABILITY ANALYSIS					
4.1	Stability Analysis	Lump Sum	1	$ 22,878	$ 22,878
SUBTOTAL TASK 4					**$ 22,878**
TASK NO. 5 - TECHNICAL REVIEW OF CONTRACT DOCUMENT DETAILS					
5.1	Review of Project Details, Specifications Sections & CQA/QC Plan	Lump Sum	1	$ 3,664	$ 3,664
SUBTOTAL TASK 5					**$ 3,664**
Service A-2: Badlands Geotechnical Services Total Proposal (Tasks 1-5)					**$ 30,662**

*Overhead is approximately 231% of professional direct labor costs, and profit is approximately 11.5% of professional direct labor and overhead costs.

EXHIBIT B to Consultant Agreement

Geosyntec consultants

Attachment F-1
Cost Proposal Sheet

Service B: Lamb Canyon Geological Services					
Task No.	**Description of Work**	**Unit**	**Estimated Quantities**	**Unit Price**	**Total**
TASK NO. 1 - GEOLOGIC MAPPING					
1.1	Geologic Mapping	Working Day	25	$ 1,168	$ 29,200
SUBTOTAL TASK 1					**$ 29,200**
TASK NO. 2 - PROJECT MANAGEMENT & REPORT PREPARATION					
2.1	Project Management & Report Preparation	Lump Sum	1	$ 9,853	$ 9,853
SUBTOTAL TASK 2					**$ 9,853**
Service B: Lamb Canyon Geological Services Total Proposal (Tasks 1-2)					**$ 39,053**

*Overhead is approximately 231% of professional direct labor costs, and profit is approximately 11.5% of professional direct labor and overhead costs.

EXHIBIT B to Consultant Agreement

Geosyntec consultants

Attachment F-1
Cost Proposal Sheet

Service C-1: Lamb Canyon Construction QA/QC Services					
Task No.	**Description of Work**	**Unit**	**Estimated Quantities**	**Unit Price**	**Total**
TASK NO. 1 - CONSTRUCTION OBSERVATION AND FIELD TESTING					
1.1	Construction Observation & Field Testing Services	Working Day	180	$ 1,014	$ 182,550
1.2	Nuclear Gauge - In-place Moisture/Density (ASTM D2922)	test	545	n/a	n/a
1.3	Sand Cone - In-place Moisture/Density (ASTM D1556)	test	65	n/a	n/a
1.4	BAT Permeability	test	15	n/a	n/a
SUBTOTAL TASK 1					**$ 182,550**
TASK NO. 2 - PROJECT CQA/QC MANAGEMENT AND REPORTS					
2.1	Project QA/QC Management and Reports	Working Day	180	$ 181	$ 32,616
SUBTOTAL TASK 2					**$ 32,616**
TASK NO. 3 - LABORATORY TESTING					
	Earthwork				
3.1	Particle Size Analysis (ASTM D422 without Hydrometer)	test	45	$ 55	$ 2,457
3.2	Particle Size Analysis (ASTM D422 with Hydrometer) - Clay	test	20	$ 116	$ 2,310
3.3	Atterberg Limits (ASTM D4318) - Clay	test	20	$ 61	$ 1,218
3.4	Lab. Modified Proctor - Moisture/Density (ASTM D1557)	test	28	$ 142	$ 3,969
3.5	Laboratory Permeability (ASTM D5084)	test	20	$ 252	$ 5,040
3.6	Gradation of Sand/Gravel Drain (ASTM C136)	test	15	$ 84	$ 1,260
3.7	Lab Permeability- Drainage Layer (ASTM D2434)	test	10	$ 187	$ 1,869
3.8	Conc. Cylinders - Compressive Strength (ASTM C39)	test	24	$ 26	$ 630
	GCL				
3.9	Mass per unit area (ASTM D5993)	test	12	$ 15	$ 180
3.1	Moisture Content (ASTM D4643)	test	12	$ 10	$ 120
3.11	Grab Strength/Elogation (ASTM D4632)	test	12	$ 55	$ 660
3.12	Index Flux (ASTM D5887)	test	12	$ 165	$ 1,980
3.13	In-Plant Geosynthetic Conformance Sampling (GCL, HDPE, & Geotextile)	Lump Sum	1	$ 1,890	$ 1,890
	HDPE				
3.14	Thickness (ASTM D5994)	test	17	$ 6	$ 102
3.15	Density (ASTM D1505)	test	17	$ 15	$ 255
3.16	Tensile Strength (ASTM D638)	test	17	$ 45	$ 765
3.17	Asperity Height (GM12)	test	17	$ 10	$ 170
3.18	Puncture Resistance (ASTM D4833)	test	17	$ 30	$ 510
3.19	Carbon Black Content (ASTM D1603)	test	17	$ 22	$ 374
3.2	Carbon Black Dispersion (ASTM D5596)	test	17	$ 25	$ 425
3.21	Destructive Seam Test (ASTM D6392)	test	80	$ 17	$ 1,360
	Geotextile				
3.22	Grab Tensile Strength/Elongation (ASTM 4632)	test	17	$ 42	$ 714
3.23	Mass per Unit Area (ASTM D5261)	test	17	$ 15	$ 255
3.24	Apparent Opening Size (ASTM D4751)	test	17	$ 70	$ 1,190
3.25	Permittivity (ASTM D4491)	test	17	$ 60	$ 1,020
3.26	Purnture Resistance (ASTM D4833)	test	17	$ 30	$ 510
3.27	Static Puncture Strength (ASTM D6241)	test	17	$ 90	$ 1,530
3.28	Trapezoidal Tear Strength (ASTM D4533)	test	17	$ 42	$ 714
	Interface Shear Testing				
3.29	Interface Direct Shear Testing (Series 1,3,4)	test	6	$ 600	$ 3,600
3.3	Interface Direct Shear Testing (Series 2)	test	2	$ 600	$ 1,200
3.31	Shipping for Soil/Materials for Testing	Lump Sum	1	$ 7,203	$ 7,203
SUBTOTAL TASK 3					**$ 45,480**
TASK NO. 4 - CERTIFICATION AND AS-BUILT REPORTS					
4.1	As-Built Certification Report	Lump Sum	1	$ 7,235	$ 7,235
SUBTOTAL TASK 4					$ 7,235
Service C-1: Lamb Canyon Construction QA/QC Services Total Proposal (Tasks 1-4)					**$ 267,881**

*Overhead is approximately 231% of professional direct labor costs, and profit is approximately 11.5% of professional direct labor and overhead costs

*In-plant laboratory sampling is based on a unit cost of $35 per sample and 5% subcontractor markup

EXHIBIT B to Consultant Agreement

Geosyntec consultants

Attachment F-1
Cost Proposal Sheet

Service C-2: Badlands Construction QA/QC Services					
Task No.	**Description of Work**	**Unit**	**Estimated Quantities**	**Unit Price**	**Total**
TASK NO. 1 - CONSTRUCTION OBSERVATION AND FIELD TESTING					
1.1	Construction Observation & Field Testing Services	Working Day	120	$ 1,014	$ 121,700
1.2	Nuclear Gauge - In-place Moisture/Density (ASTM D2922)	test	420	n/a	n/a
1.3	Sand Cone - In-place Moisture/Density (ASTM D1556)	test	90	n/a	n/a
1.4	BAT Permeability	test	7	n/a	n/a
SUBTOTAL TASK 1					**$ 121,700**
TASK NO. 2 - PROJECT CQA/QC MANAGEMENT AND REPORTS					
2.1	Project QA/QC Management and Reports	Working Day	120	$ 181	$ 21,744
SUBTOTAL TASK 2					**$ 21,744**
TASK NO. 3 - LABORATORY TESTING					
	Earthwork				
3.1	Particle Size Analysis (ASTM D422 without Hydrometer)	test	40	$ 55	$ 2,184
3.2	Particle Size Analysis (ASTM D422 with Hydrometer) - Clay	test	10	$ 116	$ 1,155
3.3	Atterberg Limits (ASTM D4318) - Clay	test	10	$ 61	$ 609
3.4	Lab. Modified Proctor - Moisture/Density (ASTM D1557)	test	40	$ 142	$ 5,670
3.5	Laboratory Permeability (ASTM D5084)	test	10	$ 252	$ 2,520
3.6	Gradation of Sand/Gravel Drain (ASTM C136)	test	5	$ 84	$ 420
3.7	Lab Permeability- Drainage Layer (ASTM D2434)	test	3	$ 187	$ 561
3.8	Conc. Cylinders - Compressive Strength (ASTM C39)	test	16	$ 26	$ 420
	GCL				
3.9	Mass per unit area (ASTM D5993)	test	7	$ 15	$ 105
3.1	Moisture Content (ASTM D4643)	test	7	$ 10	$ 70
3.11	Grab Strength/Elogation (ASTM D4632)	test	7	$ 55	$ 385
3.12	Index Flux (ASTM D5887)	test	7	$ 165	$ 1,155
3.13	In-Plant Geosynthetic Conformance Sampling (GCL, HDPE, & Geotextile)	Lump Sum	1	$ 1,085	$ 1,085
	HDPE				
3.14	Thickness (ASTM D5994)	test	8	$ 6	$ 48
3.15	Density (ASTM D1505)	test	8	$ 15	$ 120
3.16	Tensile Strength (ASTM D638)	test	8	$ 45	$ 360
3.17	Asperity Height (GM12)	test	8	$ 10	$ 80
3.18	Puncture Resistance (ASTM D4833)	test	8	$ 30	$ 240
3.19	Carbon Black Content (ASTM D1603)	test	8	$ 22	$ 176
3.2	Carbon Black Dispersion (ASTM D5596)	test	8	$ 25	$ 200
3.21	Destructive Seam Test (ASTM D6392)	test	45	$ 17	$ 765
	Geotextile				
3.22	Grab Tensile Strength/Elongation (ASTM 4632)	test	8	$ 42	$ 336
3.23	Mass per Unit Area (ASTM D5261)	test	8	$ 15	$ 120
3.24	Apparent Opening Size (ASTM D4751)	test	8	$ 70	$ 560
3.25	Permittivity (ASTM D4491)	test	8	$ 60	$ 480
3.26	Purnture Resistance (ASTM D4833)	test	8	$ 30	$ 240
3.27	Static Puncture Strength (ASTM D6241)	test	8	$ 90	$ 720
3.28	Trapezoidal Tear Strength (ASTM D4533)	test	8	$ 42	$ 336
	Interface Shear Testing				
3.29	Interface Direct Shear Testing (Series 1,3,4)	test	6	$ 600	$ 3,600
3.3	Interface Direct Shear Testing (Series 2)	test	2	$ 600	$ 1,200
3.31	Shipping for Soil/Materials for Testing	Lump Sum	1	$ 4,400	$ 4,400
SUBTOTAL TASK 3					**$ 30,319**
TASK NO. 4 - CERTIFICATION AND AS-BUILT REPORTS					
4.1	As-Built Certification Report	Lump Sum	1	$ 7,235	$ 7,235
SUBTOTAL TASK 4					**$ 7,235**
Service C-2: Badlands Construction QA/QC Services Total Proposal (Tasks 1-4)					**$ 180,998**

*Overhead is approximately 231% of professional direct labor costs, and profit is approximately 11.5% of professional direct labor and overhead costs

*In-plant laboratory sampling is based on a unit cost of $35 per sample and 5% subcontractor markup

EXHIBIT B to Consultant Agreement

Geosyntec consultants

SERVICE A-1 (Lamb Canyon), TASK 2.1 COST BREAKDOWN
Proposal for Geological and Geotechnical Engineering Services
Riverside County, California

Task Number	Task Description	Principal	Associate	Senior Professional	Project Professional	Professional	Senior Staff Professional	Staff Professional	CADD Designer	Technical Word Processor	Administrative Assistant	Clerical	Labor Subtotal	Direct Expenses	Subcontractor Expenses (5% markup included)	Expense Subtotal	TOTAL
		$205	$192	$172	$154	$136	$118	$102	$110	$55	$55	$45			5.0%		
2.1.1	Site Investigation Preparation		1					8					$1,008			$0	$1,008
2.1.2	Field Drilling							24					$2,448	$280	$6,930	$7,210	$9,658
	ESTIMATED TOTAL	0	1	0	0	0	0	32	0	0	0	0	$3,456	$280	$6,930	$7,210	$10,666

*Overhead is approximately 231% of professional direct labor costs, and profit is approximately 11.5% of professional direct labor and overhead costs.
*Based on 200 ft of drilling over 2 days

EXHIBIT B to Consultant Agreement

Geosyntec consultants

SERVICE A-1 (Lamb Canyon), TASK 3.1 COST BREAKDOWN
Proposal for Geological and Geotechnical Engineering Services
Riverside County, California

Task Number	Task Description	Principal $205	Associate $192	Senior Professional $172	Project Professional $154	Professional $136	Senior Staff Professional $118	Staff Professional $102	CADD Designer $110	Technical Word Processor $55	Administrative Assistant $55	Clerical $45	Labor Subtotal	Direct Expenses	Subcontractor Expenses (5% markup included) 5.0%	Expense Subtotal	TOTAL
3.1.1	Review Background Information												$0			$0	$0
3.1.2	Review Design		8			4		4					$2,488			$0	$2,488
3.1.3	Report		4					4					$1,176			$0	$1,176
	ESTIMATED TOTAL	0	12	0	0	4	0	8	0	0	0	0	$3,664	$0	$0	$0	$3,664

*Overhead is approximately 231% of professional direct labor costs, and profit is approximately 11.5% of professional direct labor and overhead costs.

EXHIBIT B to Consultant Agreement

Geosyntec consultants

SERVICE A-2 (Badlands), TASK 3.1 COST BREAKDOWN
Proposal for Geological and Geotechnical Engineering Services
Riverside County, California

Task Number	Task Description	Principal $205	Associate $192	Senior Professional $172	Project Professional $154	Professional $136	Senior Staff Professional $118	Staff Professional $102	CADD Designer $110	Technical Word Processor $55	Administrative Assistant $55	Clerical $45	Labor Subtotal	Direct Expenses	Subcontractor Expenses (5% markup included) 5.0%	Expense Subtotal	TOTAL
3.1.1	Review Background Information												$0			$0	$0
3.1.2	Review Design		8			4		4					$2,488			$0	$2,488
3.1.3	Report		4					4					$1,176			$0	$1,176
	ESTIMATED TOTAL	0	12	0	0	4	0	8	0	0	0	0	$3,664	$0	$0	$0	$3,664

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EXHIBIT B to Consultant Agreement

Geosyntec consultants

SERVICE A-1 (Lamb Canyon), TASK 4.1 COST BREAKDOWN
Proposal for Geological and Geotechnical Engineering Services
Riverside County, California

Task Number	Task Description	Principal $205	Associate $192	Senior Professional $172	Project Professional $154	Professional $136	Senior Staff Professional $118	Staff Professional $102	CADD Designer $110	Technical Word Processor $55	Administrative Assistant $55	Clerical $45	Labor Subtotal	Direct Expenses	Subcontractor Expenses (5% markup included) 5.0%	Expense Subtotal	TOTAL
4.1.1	Review Background Information												$0			$0	$0
4.1.2	Develop Seismic Hazard Parameters		16										$3,072			$0	$3,072
4.1.3	Perform Engineering Evaluations		16					60	12				$10,512	$180		$180	$10,692
4.1.4	Report		24					24	12	4			$8,596	$180		$180	$8,776
4.1.5	Project Management		8								2		$1,646			$0	$1,646
	ESTIMATED TOTAL	0	64	0	0	0	0	84	24	4	2	0	$23,826	$360	$0	$360	$24,186

*Overhead is approximately 231% of professional direct labor costs, and profit is approximately 11.5% of professional direct labor and overhead costs.

EXHIBIT B to Consultant Agreement

Geosyntec consultants

SERVICE A-2 (Badlands), TASK 5.1 COST BREAKDOWN
Proposal for Geological and Geotechnical Engineering Services
Riverside County, California

Task Number	Task Description	Principal $205	Associate $192	Senior Professional $172	Project Professional $154	Professional $136	Senior Staff Professional $118	Staff Professional $102	CADD Designer $110	Technical Word Processor $55	Administrative Assistant $55	Clerical $45	**Labor Subtotal**	Direct Expenses	Subcontractor Expenses (5% markup included) 5.0%	**Expense Subtotal**	**TOTAL**
5.1.1	**Review Contract Documents**		8			4		4					**$2,488**			**$0**	**$2,488**
5.1.2	**Report**		4					4					**$1,176**			**$0**	**$1,176**
	ESTIMATED TOTAL	0	12	0	0	4	0	8	0	0	0	0	**$3,664**	**$0**	**$0**	**$0**	**$3,664**

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EXHIBIT B to Consultant Agreement

Geosyntec consultants

SERVICE B-1 (Lamb Canyon), TASK 1.1 COST BREAKDOWN
Proposal for Geological and Geotechnical Engineering Services
Riverside County, California

Task Number	Task Description	Principal $205	Associate $192	Senior Professional $172	Project Professional $154	Professional $136	Senior Staff Professional $118	Staff Professional $102	CADD Designer $110	Technical Word Processor $55	Administrative Assistant $55	Clerical $45	**Labor Subtotal**	Direct Expenses	Subcontractor Expenses (5% markup included) 5.0%	**Expense Subtotal**	**TOTAL**
1.1.1	**Daily Travel Time**					0							$0			$0	$0
1.1.2	**Daily On-Site Time**					8							$1,088			$0	$1,088
1.1.3	**Daily Company Vehicle Rental**												**$0**	$80		**$80**	**$80**
1.1.4	**Daily Equipment Rental**												**$0**			**$0**	**$0**
	ESTIMATED TOTAL	0	0	0	0	8	0	0	0	0	0	0	**$1,088**	**$80**	**$0**	**$80**	**$1,168**

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EXHIBIT B to Consultant Agreement

Geosyntec consultants

SERVICE B-1 (Lamb Canyon), TASK 2.1 COST BREAKDOWN
Proposal for Geological and Geotechnical Engineering Services
Riverside County, California

Task Number	Task Description	Principal	Associate	Senior Professional	Project Professional	Professional	Senior Staff Professional	Staff Professional	CADD Designer	Technical Word Processor	Administrative Assistant	Clerical	Labor Subtotal	Direct Expenses	Subcontractor Expenses (5% markup included)	Expense Subtotal	TOTAL
		$205	$192	$172	$154	$136	$118	$102	$110	$55	$55	$45			5.0%		
2.1.1	**Report**		8	8	36				8				**$9,336**	$270		**$270**	**$9,606**
2.1.2	**Project Management**		1								1		**$247**			**$0**	**$247**
	ESTIMATED TOTAL	0	9	8	36	0	0	0	8	0	1	0	**$9,583**	**$270**	**$0**	**$270**	**$9,853**

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EXHIBIT B to Consultant Agreement

Geosyntec consultants

SERVICE C-1 (Lamb Canyon), TASK 1.1 COST BREAKDOWN
Proposal for Geological and Geotechnical Engineering Services
Riverside County, California

Task Number	Task Description	Principal $205	Associate $192	Senior Professional $172	Project Professional $154	Professional $136	Senior Staff Professional $118	Staff Professional $102	Engineering Technician (prevailing wage, no overtime) $100	Technical Word Processor $55	Administrative Assistant $55	Clerical $45	Labor Subtotal	Direct Expenses	Subcontractor Expenses (5% markup included) 5.0%	Expense Subtotal	TOTAL
1.1.1	Daily Travel Time												$0			$0	$0
1.1.2	Daily On-Site Time								8				$800	$105		$105	$905
1.1.3	Daily Company Vehicle Rental												$0	$64		$64	$64
1.1.4	Daily Equipment Rental												$0	$45		$45	$45
	ESTIMATED TOTAL	0	0	0	0	0	0	0	8	0	0	0	$800	$214	$0	$214	$1,014

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EXHIBIT B to Consultant Agreement

Geosyntec consultants

SERVICE C-2 (Badlands), TASK 1.1 COST BREAKDOWN
Proposal for Geological and Geotechnical Engineering Services
Riverside County, California

Task Number	Task Description	Principal	Associate	Senior Professional	Project Professional	Professional	Senior Staff Professional	Staff Professional	Engineering Technician (prevailing wage, no overtime)	Technical Word Processor	Administrative Assistant	Clerical	Labor Subtotal	Direct Expenses	Subcontractor Expenses (5% markup included)	Expense Subtotal	TOTAL
		$205	$192	$172	$154	$136	$118	$102	$100	$55	$55	$45			5.0%		
1.1.1	Daily Travel Time												$0			$0	$0
1.1.2	Daily On-Site Time								8				$800	$105		$105	$905
1.1.3	Daily Company Vehicle Rental												$0	$64		$64	$64
1.1.4	Daily Equipment Rental												$0	$45		$45	$45
	ESTIMATED TOTAL	0	0	0	0	0	0	0	8	0	0	0	$800	$214	$0	$214	$1,014

*Overhead is approximately 231% of professional direct labor costs, and profit is approximately 11.5% of professional direct labor and overhead costs.

EXHIBIT B to Consultant Agreement

Geosyntec consultants

SERVICE C-1 (Lamb Canyon), TASK 2.1 COST BREAKDOWN
Proposal for Geological and Geotechnical Engineering Services
Riverside County, California

Task Number	Task Description	Principal $205	Associate $192	Senior Professional $172	Project Professional $154	Professional $136	Senior Staff Professional $118	Staff Professional $102	CADD Designer $110	Technical Word Processor $55	Administrative Assistant $55	Clerical $45	Labor Subtotal	Direct Expenses	Subcontractor Expenses (5% markup included) 5.0%	Expense Subtotal	TOTAL
2.1.1	Daily Travel Time						0.60						$71			$0	$71
2.1.2	Daily On-Site Time						0.40						$47			$0	$47
2.1.3	Daily Company Vehicle Rental												$0	$16		$16	$16
2.1.4	Report Preparation						0.40						$47			$0	$47
	ESTIMATED TOTAL	0	0	0	0	0	1.40	0	0	0	0	0	$165	$16	$0	$16	$181

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EXHIBIT B to Consultant Agreement

Geosyntec consultants

SERVICE C-2 (Badlands), TASK 2.1 COST BREAKDOWN
Proposal for Geological and Geotechnical Engineering Services
Riverside County, California

Task Number	Task Description	Principal $205	Associate $192	Senior Professional $172	Project Professional $154	Professional $136	Senior Staff Professional $118	Staff Professional $102	CADD Designer $110	Technical Word Processor $55	Administrative Assistant $55	Clerical $45	Labor Subtotal	Direct Expenses	Subcontractor Expenses (5% markup included) 5.0%	Expense Subtotal	TOTAL
2.1.1	Daily Travel Time						0.60						$71			$0	$71
2.1.2	Daily On-Site Time						0.40						$47			$0	$47
2.1.3	Daily Company Vehicle Rental												$0	$16		$16	$16
2.1.4	Report Preparation						0.40						$47			$0	$47
	ESTIMATED TOTAL	0	0	0	0	0	1.40	0	0	0	0	0	$165	$16	$0	$16	$181

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EXHIBIT B to Consultant Agreement

Geosyntec consultants

SERVICE C-1 (Lamb Canyon), TASK 4.1 COST BREAKDOWN
Proposal for Geological and Geotechnical Engineering Services
Riverside County, California

Task Number	Task Description	Principal $205	Associate $192	Senior Professional $172	Project Professional $154	Professional $136	Senior Staff Professional $118	Staff Professional $102	CADD Designer $110	Technical Word Processor $55	Administrative Assistant $55	Clerical $45	**Labor Subtotal**	Direct Expenses	Subcontractor Expenses (5% markup included) 5.0%	**Expense Subtotal**	**TOTAL**
4.1.1	**Report**		4		12			24	8	2		2	**$6,144**	$420		**$420**	**$6,564**
4.1.2	**Project Management**				4						1		**$671**			**$0**	**$671**
	ESTIMATED TOTAL	0	4	0	16	0	0	24	8	2	1	2	**$6,815**	**$420**	**$0**	**$420**	**$7,235**

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EXHIBIT B to Consultant Agreement

Geosyntec consultants

SERVICE C-2 (Badlands), TASK 4.1 COST BREAKDOWN
Proposal for Geological and Geotechnical Engineering Services
Riverside County, California

Task Number	Task Description	Principal $205	Associate $192	Senior Professional $172	Project Professional $154	Professional $136	Senior Staff Professional $118	Staff Professional $102	CADD Designer $110	Technical Word Processor $55	Administrative Assistant $55	Clerical $45	**Labor Subtotal**	Direct Expenses	Subcontractor Expenses (5% markup included) 5.0%	**Expense Subtotal**	**TOTAL**
4.1.1	**Report**		4		12			24	8	2		2	**$6,144**	$420		**$420**	**$6,564**
4.1.2	**Project Management**				4						1		**$671**			**$0**	**$671**
	ESTIMATED TOTAL	0	4	0	16	0	0	24	8	2	1	2	**$6,815**	**$420**	**$0**	**$420**	**$7,235**

*Overhead is approximately 231% of professional direct labor costs, and profit is approximately 11.5% of professional direct labor and overhead costs.

Geosyntec
consultants

Attachment F-2

Rate Schedule

EXHIBIT B to Consultant Agreement

CONFIDENTIAL

GEOSYNTEC CONSULTANTS
2010 RATE SCHEDULE

Engineer/Scientist	Rate/Hour
Staff Professional	$102
Senior Staff Professional	$118
Professional	$136
Project Professional	$154
Senior Professional	$172
Associate	$192
Principal	$205
Construction Services	
Prevailing Wage Engineering Technician	$ 100
Design, Graphical, and Administrative Services	
Designer	$110
Senior Drafter/Senior CADD Operator	$ 98
Drafter/CADD Operator/Artist	$ 86
Admin Assistant/Tech Word Processor	$ 55
Clerical	$ 45
General	
Direct Expenses	Cost plus 0%
Subcontract Services	Cost plus 5%
Communications Fee	0% of Professional Fees
Specialized Computer Applications (per hour)	$ 15
Personal Automobile (per mile)	Current IRS Rate
Photocopies (per page)	$ .09

Rates are provided on a confidential basis and are client and project specific.
Rates will be adjusted annually based on the US Department of Labor, Bureau of Labor Statistics, Consumer Price Index for All Urban Consumers.
Rates for field equipment, health and safety equipment, and graphical supplies presented upon request.
Average overhead is approximately 231% of professional direct labor costs, and average profit is approximately 11.5% of professional direct labor and overhead costs.
Overtime and double overtime for prevailing wage workers will be billed at 1.5 and 2.0 times the normal hourly rate, respectively, based on California law.