TURF DIAGNOSTICS & DESIGN
"Managing the Elements Through Science"

October 9, 2009

Paul Hagy
Neese Materials
1919 South Shiloh, Suite 312-LB2
Garland, TX 75042-8234

RE: Product Development - File #09100016

Dear Mr. Hagy:

Enclosed are the results of the sand sample received by our laboratory on 10/7/09. This sample was tested for potential use as a bunker sand. The results are being compared to published bunker guidelines.

The penetrometer value of the Professional Choice Bunker Sand sample is 3.1 kg/cm^2, indicating a very low tendency to bury the ball. The crusting and setup values are desirable. The infiltration rate of this sample is 54.2 in/hr at a bulk density of 1.5 g/cc, which meets the recommended minimum infiltration rate for well-drained bunker sand.

It is desirable for bunker sand used in green side bunkers to be compatible with the greens mix, because of potential risks from bunker sand being sprayed onto the greens. The particle size results indicate the Professional Choice Bunker Sand sample is higher in gravel and very coarse sand content than USGA particle size recommendations for greens. Gravel and very coarse sand particles tend to be harder to work into the thatch layers of the turfgrass. If these particles are not worked in and are on the surface, they can be unsightly and increase the risk of mower wear through dinging. Potential risks from this bunker sand may be reduced by aerification and topdressing of the greens with sand that is compatible with the rootzone.

If you have any questions or are in need of further assistance, please call. Samples are generally kept on the premises for 45 days after report date. Thank you for using Turf Diagnostics and Design, Inc.

Sincerely,

Sam Ferro

Digitally signed by Sam Ferro
DN: cn=Sam Ferro, o=Turf Diagnostics Design, ou, email=sferro@turfdiag.com, c=US
Date: 2009.10.09 13:16:24 -05'00'

Sam Ferro
President

File: Neese Materials

Turf Diagnostics & Design, Inc.
613 E. 1st St. Linwood, KS 66052
Phone: 913-723-3700 Fax: 913-723-3701 Web: www.turfdiag.com

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ACCREDITED

Neese Materials
Paul Hagy
1919 South Shiloh, Suite 312-LB2
Garland, TX 75042-8234
PHONE: 972-278-1585

Date received Oct-07-2009
Account No. 01962140
Date reported Oct-09-2009
Facility Product Development

Bunker Sand Evaluation

Lab ID#	Sample Name	Dry Color	Wet Color	Penetrometer Value kg/cm2
09100016-1	Professional Choice Bunker Sand	2.5Y 8/3 Pale Yellow	2.5Y 7/4 Pale Yellow	3.1

Lab ID#	Sample Name	Shape Angularity	Shape Sphericity	Crusting	Set-Up
09100016-1	Professional Choice Bunker Sand	Sub-Angular to Angular	Medium	None	None

A2LA Testing Certificate Number 797-01 Bunker SOP

Samples were tested as received and comments pertain only to the samples shown.
This report may not be reproduced in part, but only in full.
Sample condition upon receipt was normal.
Samples were received with a transmittal letter.

Reviewed by _____

613 E. 1st St. Linwood, Kansas 66052 ■ Phone: 913-723-3700 ■ Fax: 913-723-3701
E-mail: turfdiag@turfdiag.com ■ Website: http://www.turfdiag.com

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Paul Hagy
1919 South Shiloh, Suite 312-LB2
Garland, TX 75042-8234
PHONE: 972-278-1585
FAX: 972-421-1856

Date Received Oct-7-2009
Account No. 01962140
Date Reported Oct-9-2009
Facility Product Development

Infiltration Rate

Lab ID#	Sample Name	Infiltration Rate* in/hr	Bulk Density g/cc
09100016-1	Professional Choice Bunker Sand	54.2	1.53

A2LA Testing Certificate Number 797-01

* Saturated Hydraulic Conductivity (K-SAT) determined with constant head and adjusted to 20°C. This method is designed to evaluate submitted disturbed soil samples. The cores were hand packed to the stated bulk density which may or may not be related to field bulk density.

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Particle Size Evaluation*

						% Retained on USGA mm (US sieve)				
Lab ID#	**Sample Name**	**% Sand 2.0 - 0.05 mm**	**% Silt 0.05-0.002mm**	**% Clay < 0.002mm**	**Gravel 2.0 (10)**	**V. Coarse 1.0 (18)**	**Coarse 0.5 (35)**	**Medium 0.25 (60)**	**Fine 0.15 (100)**	**V. Fine 0.05 (270)**
09100016-1	Professional Choice Bunker Sand	96.2	< 1.0	< 1.0	3.1	24.6	33.7	23.4	9.8	4.7
USGA Recommendations for Greens		> 92%	< 5%	< 3%	< 3%	< 7%**	> 60% Combined		< 20%	< 5%

Lab ID#	**Sample Name**	**Uniformity Coefficient Cu**	**D15 mm**	**D50 mm**	**D85 mm**	**Shape Angularity**	**Shape Sphericity**	**Acid Reaction**	**pH‡ 1:1**	**% Organic Matter Dry Wt.*** **
09100016-1	Professional Choice Bunker Sand	4.1	0.25	0.63	1.43	Sub-Angular to Angular	Medium	None		

A2LA Testing Certificate Number 797-01 *ASTM F1632 Method B & Determination of Size Factors SOP ‡ASTM D4972 w/ H2O ***ASTM F1647 Method B

**Maximum of 10% combined on Gravel (2.0 mm) and Very Coarse (1.0 mm) fractions.

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