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Transmittal

TO:

Delaney Peterson
Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle, WA 98101

DATE: 1/19/2021	GTX NO: 312780
RE: GascoSiltronic: US Moorings 11242020	

COPIES	DATE	DESCRIPTION
	1/19/2021	**January 2021 Laboratory Test Report**

REMARKS:

SIGNED:

Barbara Sanchez, Assistant Laboratory Manager

APPROVED BY:

Jonathan Campbell, Laboratory Manager

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January 19, 2021

Delaney Peterson
Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle, WA 98101

RE: GascoSiltronic: US Moorings 11242020, (GTX-312780)

Dear Delaney Peterson:

Enclosed are the test results you requested for the above referenced project. GeoTesting Express, Inc. (GTX) received one sample from you on 11/24/2020. This sample was labeled as follows:

Boring Number	Sample Number
USMPDI-	013SG-201116

GTX performed the following tests on this sample:

ASTM D2216 - Moisture Content
ASTM D4318 - Atterberg Limits
ASTM D6913/D7928 - Grain Size Analysis - Sieve and Hydrometer
ASTM D854 - Specific Gravity

A copy of your test request is attached.

The results presented in this report apply only to the items tested. This report shall not be reproduced except in full, without written approval from GeoTesting Express. The remainder of these samples will be retained for a period of sixty (60) days and will then be discarded unless otherwise notified by you. Please call me if you have any questions or require additional information. Thank you for allowing GeoTesting Express the opportunity of providing you with testing services. We look forward to working with you again in the future.

Respectfully yours,

Barbara Sanchez
Assistant Laboratory Manager

GeoTesting EXPRESS

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Geotechnical Test Report **1/19/2021**

GTX-312780
GascoSiltronic: US Moorings 11242020

Prepared for:

Anchor QEA, LLC

Client:	Anchor QEA, LLC				
Project:	GascoSiltronic: US Moorings 11242020				
Location:				Project No:	GTX-312780
Boring ID:	USMPDI-	Sample Type:	bag	Tested By:	ckg
Sample ID:	013SG-201116	Test Date:	01/06/21	Checked By:	bfs
Depth :	---	Test Id:	595601		
Test Comment:	---				
Visual Description:	Wet, dark olive brown silt				
Sample Comment:	---				

Moisture Content of Soil and Rock - ASTM D2216

Boring ID	Sample ID	Depth	Description	Moisture Content,%
USMPDI-	013SG- 201116	---	Wet, dark olive brown silt	161.3

Notes: Temperature of Drying : 110º Celsius

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Client:	Anchor QEA, LLC			
Project:	GascoSiltronic: US Moorings 11242020			
Location:			Project No:	GTX-312780
Boring ID: USMPDI-		Sample Type: bag	Tested By:	ckg
Sample ID: 013SG-201116		Test Date: 01/12/21	Checked By:	bfs
Depth : ---		Test Id: 595602		
Test Comment:	---			
Visual Description:	Wet, dark olive brown silt			
Sample Comment:	---			

Specific Gravity of Soils by ASTM D854

Boring ID	Sample ID	Depth	Visual Description	Specific Gravity
USMPDI-	013SG- 201116	---	Wet, dark olive brown silt	2.60

Notes: Specific Gravity performed by using method B (oven dried specimens) of ASTM D854
Moisture Content determined by ASTM D2216.

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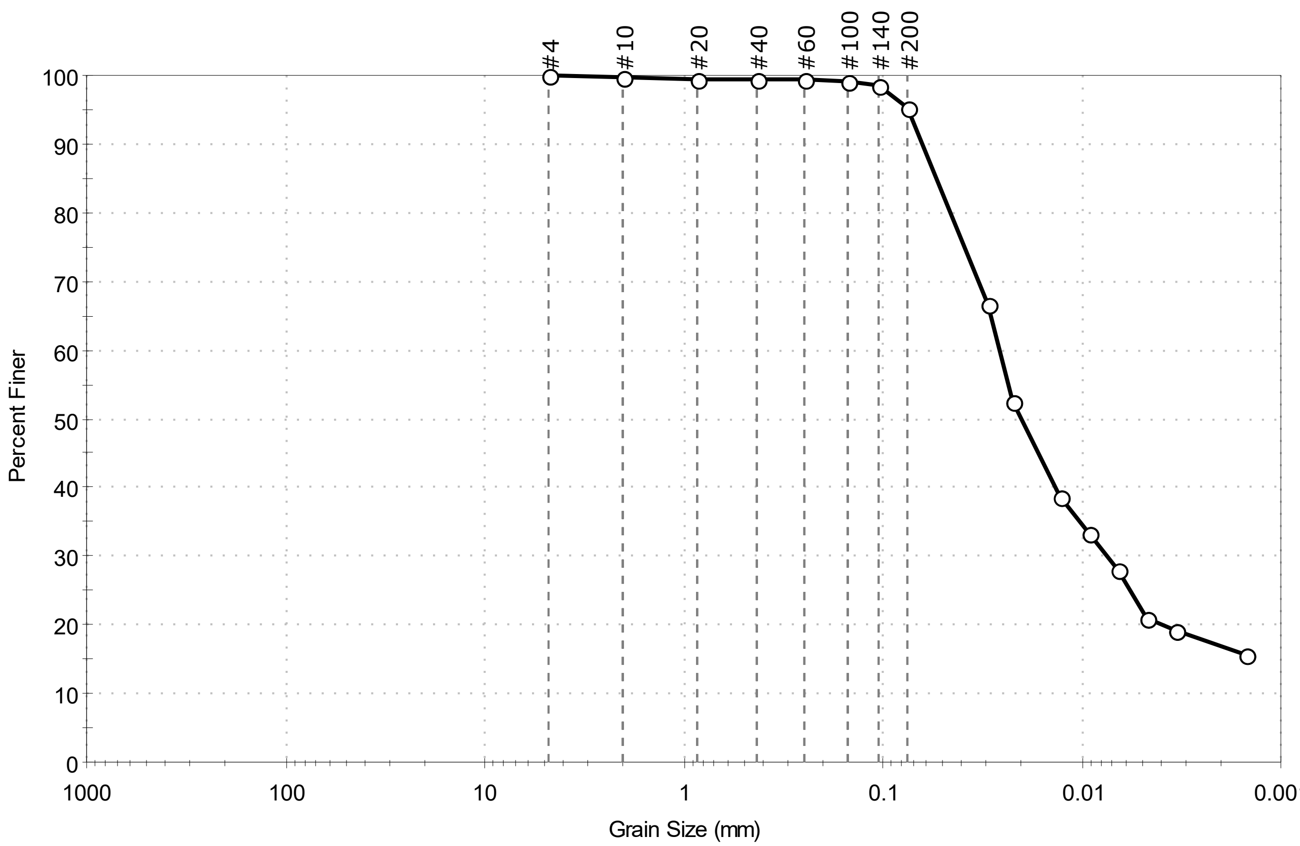
Client:	Anchor QEA, LLC		
Project:	GascoSiltronic: US Moorings 11242020		
Location:		Project No:	GTX-312780
Boring ID: USMPDI-	Sample Type: bag	Tested By:	ckg
Sample ID: 013SG-201116	Test Date: 01/09/21	Checked By:	bfs
Depth : ---	Test Id: 595600		

Test Comment: ---
Visual Description: Wet, dark olive brown silt
Sample Comment: ---

Particle Size Analysis - ASTM D6913/D7928



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.0	4.8	95.2

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	99		
#140	0.11	98		
#200	0.075	95		
Hydrometer	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0299	67		
---	0.0221	53		
---	0.0128	39		
---	0.0091	33		
---	0.0066	28		
---	0.0047	21		
---	0.0033	19		
---	0.0015	16		

Coefficients

D_{85} =0.0541 mm
D_{30} =0.0074 mm
D_{60} =0.0259 mm
D_{15} =N/A
D_{50} =0.0200 mm
D_{10} =N/A
C_u =N/A
C_c =N/A

Classification

ASTM Elastic SILT (MH)

AASHTO Clayey Soils (A-7-5 (54))

Sample/Test Description

Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---
Dispersion Device : Apparatus A - Mech Mixer
Dispersion Period : 1 minute
Est. Specific Gravity : 2.65
Separation of Sample: #200 Sieve

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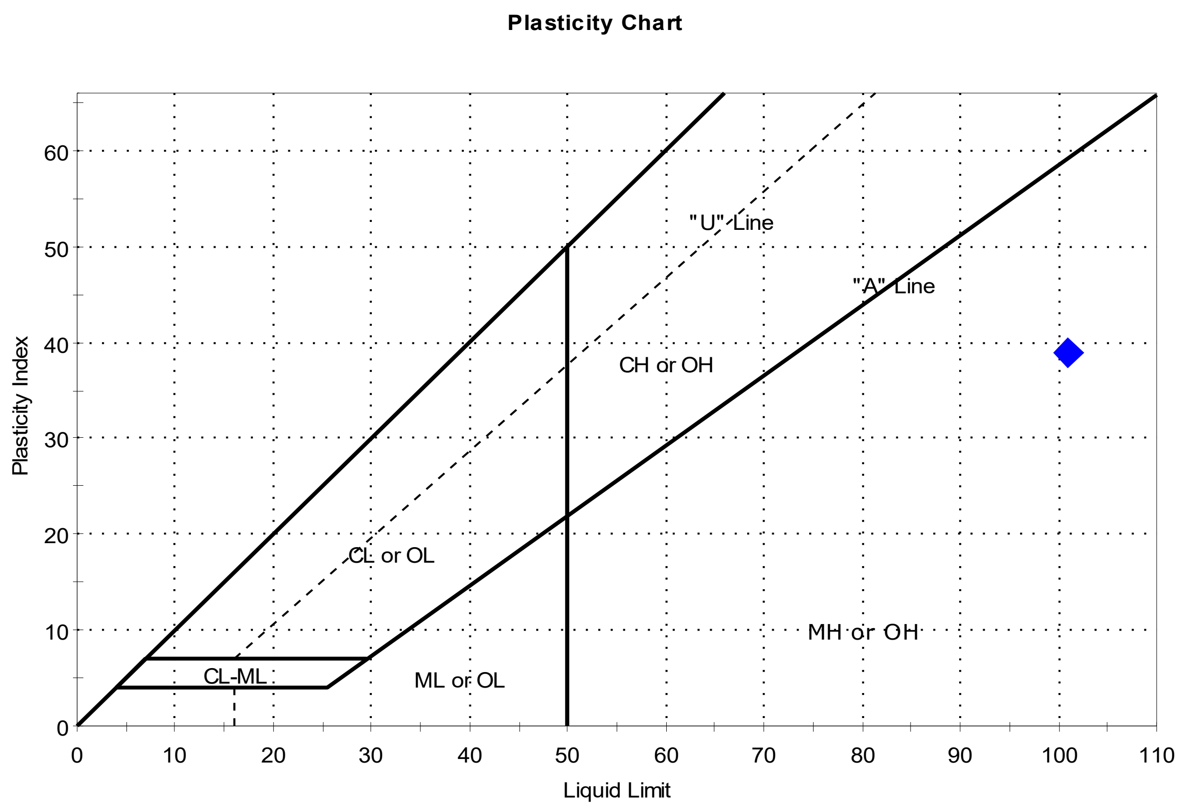
Client:	Anchor QEA, LLC		
Project:	GascoSiltronic: US Moorings 11242020		
Location:		Project No:	GTX-312780

Boring ID:	USMPDI-	Sample Type:	bag	Tested By:	cam
Sample ID:	013SG-201116	Test Date:	01/14/21	Checked By:	bfs
Depth :	---	Test Id:	595599		

Test Comment: ---
Visual Description: Wet, dark olive brown silt
Sample Comment: ---

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	013SG-201116	USMPDI-	---	161	101	62	39	2.5	Elastic SILT (MH)

Sample Prepared using the WET method

1% Retained on #40 Sieve

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

ANCHOR QEA
1201 3rd Avenue, Suite 2600, Seattle, WA 98101

ENVIRONMENTAL SAMPLE CHAIN OF CUSTODY

COC ID: GEO-20201117-162022

POC: # Delaney Peterson (360-715-2707)
1605 Cornwall Avenue, Bellingham, WA 98225

Project: GascoSiltronic: US Moorings
Client: NW Natural

Sample Custodian: SN
Lab: Geotesting Express

COC Sample Number	Field Sample ID	Sample Type	Matrix	Collected Date	Collected Time	# Containers	Lab QC*	Test Request	Method	TAT**	Preservative
001	USMPDI-013SG-201116	N	SE	11/16/2020	12:15	1	☐				
								Atterberg Limits	D4318	30	4°C
								Grain Size	D6913/D7928	30	4°C
								Moisture Content	D2216	30	4°C

+specific gravity

Comment:

	Relinquished By:	Received By:	Relinquished By:	Received By:	Relinquished By:	Received By:
Signature	[signature]	[signature]				
Print Name	Sasha Norwood	Scott Ferguson				
Company	Anchor QEA	GTX				
Date/Time	11/20/20 @0710	11/24/20 / 11:00				

* Lab QC Requested for sample when box is checked ** TAT = Turn Around Time in DAYS # POC = Project Point of Contact

Date Printed: 11/17/2020

GeoTesting EXPRESS

WARRANTY and LIABILITY

GeoTesting Express (GTX) warrants that all tests it performs are run in general accordance with the specified test procedures and accepted industry practice. GTX will correct or repeat any test that does not comply with this warranty. GTX has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GTX may report engineering parameters that require us to interpret the test data. Such parameters are determined using accepted engineering procedures. However, GTX does not warrant that these parameters accurately reflect the true engineering properties of the *in situ* material. Responsibility for interpretation and use of the test data and these parameters for engineering and/or construction purposes rests solely with the user and not with GTX or any of its employees.

GTX's liability will be limited to correcting or repeating a test which fails our warranty. GTX's liability for damages to the Purchaser of testing services for any cause whatsoever shall be limited to the amount GTX received for the testing services. GTX will not be liable for any damages, or for any lost benefits or other consequential damages resulting from the use of these test results, even if GTX has been advised of the possibility of such damages. GTX will not be responsible for any liability of the Purchaser to any third party.

Commonly Used Symbols

A	pore pressure parameter for $\Delta\sigma_1 - \Delta\sigma_3$
B	pore pressure parameter for $\Delta\sigma_3$
CAI	CERCHAR Abrasiveness Index
CIU	isotropically consolidated undrained triaxial shear test
CR	compression ratio for one dimensional consolidation
CSR	cyclic stress ratio
C_c	coefficient of curvature, $(D_{30})^2 / (D_{10} \times D_{60})$
C_u	coefficient of uniformity, D_{60}/D_{10}
C_c	compression index for one dimensional consolidation
C_α	coefficient of secondary compression
c_v	coefficient of consolidation
c	cohesion intercept for total stresses
c'	cohesion intercept for effective stresses
D	diameter of specimen
D	damping ratio
D_{10}	diameter at which 10% of soil is finer
D_{15}	diameter at which 15% of soil is finer
D_{30}	diameter at which 30% of soil is finer
D_{50}	diameter at which 50% of soil is finer
D_{60}	diameter at which 60% of soil is finer
D_{85}	diameter at which 85% of soil is finer
d_{50}	displacement for 50% consolidation
d_{90}	displacement for 90% consolidation
d_{100}	displacement for 100% consolidation
E	Young's modulus
e	void ratio
e_c	void ratio after consolidation
e_o	initial void ratio
G	shear modulus
G_s	specific gravity of soil particles
H	height of specimen
H_R	Rebound Hardness number
i	gradient
I_S	Uncorrected point load strength
$I_{S(50)}$	Size corrected point load strength index
H_A	Modified Taber Abrasion
H_T	Total hardness
K_o	lateral stress ratio for one dimensional strain
k	permeability
LI	Liquidity Index
m_v	coefficient of volume change
n	porosity
PI	plasticity index
P_c	preconsolidation pressure
p	$(\sigma_1 + \sigma_3) / 2$, $(\sigma_v + \sigma_h) / 2$
p'	$(\sigma'_1 + \sigma'_3) / 2$, $(\sigma'_v + \sigma'_h) / 2$
p'_c	p' at consolidation
Q	quantity of flow
q	$(\sigma_1 - \sigma_3) / 2$
q_f	q at failure
q_o, q_i	initial q
q_c	q at consolidation
S_r	Post cyclic undrained shear strength
T	temperature
t	time
U, UC	unconfined compression test
UU, Q	unconsolidated undrained triaxial test
u_a	pore gas pressure
u_e	excess pore water pressure
u, u_w	pore water pressure
V	total volume
V_g	volume of gas
V_s	volume of solids
V_s	shear wave velocity
V_v	volume of voids
V_w	volume of water
V_o	initial volume
v	velocity
W	total weight
W_s	weight of solids
W_w	weight of water
w	water content
w_c	water content at consolidation
w_f	final water content
w_l	liquid limit
w_n	natural water content
w_p	plastic limit
w_s	shrinkage limit
w_o, w_i	initial water content
α	slope of q_f versus p_f
α'	slope of q_f versus p_f'
γ_t	total unit weight
γ_d	dry unit weight
γ_s	unit weight of solids
γ_w	unit weight of water
ε	strain
ε_{vol}	volume strain
ε_h, ε_v	horizontal strain, vertical strain
μ	Poisson's ratio, also viscosity
σ	normal stress
σ'	effective normal stress
σ_c, σ'_c	consolidation stress in isotropic stress system
σ_h, σ'_h	horizontal normal stress
σ_v, σ'_v	vertical normal stress
σ'_{vc}	Effective vertical consolidation stress
σ_1	major principal stress
σ_2	intermediate principal stress
σ_3	minor principal stress
τ	shear stress
φ	friction angle based on total stresses
φ'	friction angle based on effective stresses
φ'_r	residual friction angle
φ_{ult}	φ for ultimate strength