

Mr. David Locey NYDEC Project Manager New York State Department of Environmental Conservation Division of Environmental Remediation, Region 9 270 Michigan Ave Buffalo, NY 14203-2915

^{Subject:} Union Ship Canal Public Open Space, Site #B00164 Cap Verification Work Summary

Dear Mr. Locey:

On behalf of Buffalo Urban Development Corporation (BUDC), Arcadis U.S., Inc. (Arcadis) is pleased to provide New York State Department of Environmental Conservation (NYSDEC) with this Work Summary for the cap verification performed at the Hanna Furnace Sub-parcel 3, Site #B00164, Union Ship Canal Open Space Site (Site) in response to the NYSDEC letter dated June 1, 2016 (Appendix A). This work was performed in accordance with the Work Plan dated August 2, 2016 and conditionally approved by NYSDEC on August 3, 2016 (Work Plan). The objective was to verify the thickness of soil ground cover above a subsurface demarcation fabric.

WORK SUMMARY

Prior to conducting subsurface work, Arcadis completed utility clearance activities consisting of an 811 call, a review of record drawings, and a detailed Site inspection.

Arcadis subcontracted with Nothnagle Drilling Inc. (Nothnagle) to perform the work as detailed in the Work Plan. The work occurred August 4 through August 5, 2016. A total of 44 direct push borings were advanced using a track mounted Geoprobe[®] rig. The soil boring locations were selected to avoid existing underground utilities and to satisfy NYSDEC's request for two borings per acre with several locations selected near the Site perimeter. As outlined in correspondence with NYSDEC, soil borings were advanced mid slope on two of the landscaped soil mounds. Arcadis U.S., Inc. 50 Fountain Plaza Suite 600 Buffalo New York 14202 Tel 716 667 0900 Fax 716 667 0279 www.arcadis.com

ENVIRONMENTAL

Date: August 17, 2016

Contact: Ben Girard

Phone: 716-667-6645

Email: ben.girard@arcadis.com

Our ref: 04080012.0000

Soil borings were advanced to a minimum of three feet below ground surface (bgs) and no deeper than four feet bgs. Each Boring was logged and visually characterized for color, texture, moisture content, evidence of demarcation layer, and evidence of contrasting composition with underlying fill. The boring logs are included in Appendix B. Photographs of each boring are included in Appendix C.

All soil borings were backfilled with their respective drill cuttings. Hydrated bentonite was used when additional backfill material was needed.

RESULTS

The soil cap is a fill layer comprised of Silty Sand and Sandy Silt with trace to little gravel and was observed throughout the site at depths ranging from 11 to 32 inches bgs. An orange demarcation fabric was also observed throughout the site below the cap material in 39 of the 44 soil borings.

Soil boring locations and their depth to cap demarcation are identified on Figure 1. Photographs of the boring locations are included in Appendix D.

There was no demarcation fabric observed at CB-5, CB-13, CB-19, CB-22 or CB-23. For these locations, the estimated cap thickness was determined by the contrast in surficial fill and underlying, existing onsite material.

CONCLUSION

Forty-three of the soil borings indicated an estimated cap thickness greater than or equal to 14 inches. Only soil boring CB-23, in which the demarcation fabric was not evident, suggested the soil cap may have been as shallow as 11 inches.

The original cap design was established with a thickness of 24 inches to ensure a minimum cap thickness of 12 inches would exist given that future settling, compaction, and erosion would likely occur over time. The findings in the field demonstrated that an adequate cap thickness exists five years after the cap was installed in 2011. Thus, the results of this field investigation and discussions with NYSDEC confirm that the cap thickness throughout the Site sufficiently provides a safe barrier to the public, as intended.

Mr. David Locey August 17, 2016

CLOSING

If you have any comments or questions regarding this Work Summary please feel free to contact me.

Sincerely,

Arcadis U.S., Inc.

Ben Girard Project Manager

^{Copies:} Pete Cammarata, BUDC Michael Nasca, Arcadis

Enclosures:

Figures

Figure 1A	Soil Boring Locations (West)
Figure 1B	Soil Boring Locations (East)

Appendices

Appendix A	NYSDEC Soil Cap Verification Letter
Appendix B	Field Soil Boring Logs
Appendix C	Soil Boring Photographs
Appendix D	Soil Boring Location Photographs

This proposal and its contents shall not be duplicated, used or disclosed — in whole or in part — for any purpose other than to evaluate the proposal. This proposal is not intended to be binding or form the terms of a contract. The scope and price of this proposal will be superseded by the contract. If this proposal is accepted and a contract is awarded to Arcadis as a result of — or in connection with — the submission of this proposal, Arcadis and/or the client shall have the right to make appropriate revisions of its terms, including scope and price, for purposes of the contract. Further, client shall have the right to duplicate, use or disclose the data contained in this proposal only to the extent provided in the resulting contract.

\\arcadis-us.com\officedata\buffalo-ny\projects\04080012.0000 - budc - cap verification\11 draft reports and presentations\draft with appendices & figures\budc - union ship canal work summary 20160817.docx

FIGURES



Figure 1A: Union Ship Canal Cap Verification (West) Buffalo, NY



ARCADIS Design & C for natural built asset

Design & Consultancy for natural and built assets



* Demarcation fabric not observed

Figure 1B: Union Ship Canal Cap Verification (East) Buffalo, NY





Design & Consultancy for natural and built assets



* Demarcation fabric not observed

APPENDIX A

NYSDEC Soil Cap Verification Letter



NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 9 270 Michigan Avenue, Buffalo, NY 14203-2915 P: (716) 851-7220 I F: (716) 851-7226 www.dec.ny.gov

June 1, 2016

Mr. Peter M. Cammarata Buffalo Urban Development Corporation 95 Perry Street, Suite 403 Buffalo, New York 14203

Dear Mr. Cammarata:

Final Engineering Report Hanna Furnace Sub-parcel 3, Site #B00164 Union Ship Canal Public Open Space Buffalo, Erie County

In a November 27, 2012 email, you mentioned that Arcadis had compared their draft Final Engineering Report for the subject site against a checklist provided by DEC, and found that it would not be possible to provide all of the items for a complete FER. A NYS P.E. stamped drawing, identifying the areal extent and thickness of the site's cover system could not be prepared with the data available. The DEC will therefore require the thickness of the cover to be field verified.

In order to meet the requirements of the program, the DEC recommends that the soil cover be verified in the field with shallow soil borings and core samples. A minimum of two boring locations per acre of the vegetated, soil-covered portions of the site would seem sufficient provided the results confirm the soil cover meets the required thickness. The soil cores should be examined and described in terms of established soil classification systems, noting any evidence of the cover's demarcation fabric and contrasts with the original, underlying fill material. Some boring locations should be biased to the perimeter of the site and the tops of the landscaped soil mounds located on the south side of the canal.

Please provide a drawing of the proposed boring locations for DEC review with a tentative work schedule.

Sincerely,

David P. Locey

NYSDEC Project Manager

DPL/tm

ec: C. Staniszewski, NYSDEC



NEW YORK Department of STATE OF OPPORTUNITY Conservation

APPENDIX B

Field Soil Boring Logs



Sample		DIS				
Sampi		LUG		6468000 maa		
Boring/Well	<u> </u>		Project/No.	0900012.000		Page of
Site Location	BJff Val co	mmon	<u>NY</u>	Drilling Started	Complete	a <u>8 44 16</u>
Total Depth	Drilled	4	Feet	Hole Diameter inches	Coring Device	Macro Cone
Length and of Coring De	Diameter evice	4'	+ 2"		Sampling	Intervalfeet
Land-Surfac	æ Elev.	_	feet	Surveyed Estimated	Datum	
Drilling Fluid	Used	NA			Drilling Method	(Geografie
Drilling Contractor	Noth	nagle		Driller	Jeff	
Prepared By	Ryan	Clare			Hammer Weight NA	Hammer NA ins.
Sample/Core (feet below lar	Depth nd surface)	Core Recovery	USCS			
From	To	(inches)	67)QA .	Sample/Core Description		A constant
\vdash	7	70-		(0-B) ISROWN SITT ON	d Vt Sand	TIACE
			PIL	grandles angular to sub	s angular, o	ly, losse
				to md. dense, lasts		
		ļ	SM	[8-22"] yellowish brown	Ut Sond	trace to
				little small to large	pebbles any	poter to randel
				dry, loose. DEMARIA	TEON GRED	> @ 22" bys.
				(22"-42") Mixed soil	and Fill	uncter/+/
				Dk. brown uf sand	8 5/17 fo	r y" then
				grading to Die brown	5/29.61	ich, Stone
:				coal meterial moist	, dense d	N loo V
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Sample		DIS		
Sample			B 1 (4)	04080012.0000
Boring/Well	<u>C3</u> -	~	Project/No.	
Location	Ship		nal (c	mmons Started Completed 8-4-16
Total Depth	Drilled	9	Feet	Hole Diameter inches I ype of Sample/ Coring Device Macro Core
Length and I of Coring De	Diameter wice	4	8-9	Sampling Intervalfeet
Land-Surfac	e Elev.		feet	Surveyed Estimated Datum
Drilling Fluid	Used	NA		Drilling Method Geopole
Drilling Contractor	Noth	nagle		Driller Jeff S. Helper
Prepared By	Ryan	Clare		Hammer Hammer NA ins.
Sample/Core I (feet below lan	Depth Id surface)	Core		
From	То	Recovery (inches)	USCS	Sample/Core Description
0	4	41	ML	(0-12") Brown Silt + Vf Sand, frece granely
				sub angular, dry loose, rodts
			SM	(12'-28") It. brown vf Sand, little Silt,
				little and to medium peobles angular to
				sus randed dry to maist, loose to donse
				few freetined rocks, DEMARCATION GRED
				at 28" bys.
				(28"-38") Fill moterial - Dk reddish brown
				silt + uf sand mixed with pieces of
		[wood, concrete slog, dense to und lande,
			SP	(38"- 41") Greyish brow - fine Sand, tred
				to little grances to modilin pebbles, sub
				and to sub randed, moist to dry, losse.
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Sample	ARCA e/Core	DIS Loa						
Boring/Well	CB-	3	Project/No.	04080	000.2100	0		Page of
Site Location	ship	Can	al (or	mmons	Drilling Started		Drilling Completed	8-4-16
Total Depth	Drilled	4	Feet	Hole Diameter	<u>2</u> inches		Type of Sample/ Coring Device	Macro Core
Length and I of Coring De	Diameter wice	41	2 2 "				Sampling Ir	iterval <u>4</u> feet
Land-Surfac	e Elev.		feet	Surveyed	Estimated	1	Datum	2011
Drilling Fluid	Used	NA					Drilling Method	Bardose Recorde
Drilling Contractor	Noth	nagle				Driller	Jeff S.	Helper
Prepared By	Ryan	Clare				_	Hammer Weight <u>NA</u>	Hammer Drop <u>NA</u> ins.
Sample/Core (feet below lar	Depth id surface)	Core Recovery	USC S					
From	То	(inches)		Sample/Core Des	scription	<u> </u>	A	- ")) h
0	7	91	57		V rund	+ >9	hold some	Silf Trece
		1	<u> </u>	42 11the	glandes	12)	19 Pobsker a	ing clar to
	<u> </u>	<u> </u>		sub ran	deal, dry	10	use, rodts.	
			ML	(12"-19	") very da	the bro	un Silt, son	re vit Sand,
				trace g	randes a	nsul-r	, moist, ve	vy danse.
			SM	(19"-32") It. olim	brow	m uf Sand	& Silf, little
				grandes !	to 19 pess	65, 0	angular to la	unded, moist,
				dense to	very de	nse.	DEMARCAT	ION GRED
				at 32"	ber.			
		- <u> </u>		(2)".41"	Mixed	Fi	11 - ven d	e baws
	1			Sill Ly	F Sent 1	1 510	a Diala Pac	le constrat
					1. 2011 F	1 31-	- A Diaco	indich by
				trom s		~>~	(and picky)	priarty to
				19,10	ese.			
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Sample/Core Log	
Boring/Well CB-4 Project/No. 04080012.0000 Page of	
Site Location Ship Canal Commons Drilling Drilling Started Drilling Drilling Completed 8-4-16	
Total Depth Drilled 4 Feet Hole Diameter 2 inches Type of Sample/ Coring Device Macro Co	sine
Length and Diameter of Coring Device U' & & Sampling Interval 4 fr	eet
Land-Surface Elevfeet Surveyed Estimated Datum	col o
Drilling Fluid Used NA Drilling Method	006
Contractor Nothnagle Driller Deff S, Helper	<u> </u>
Prepared Ryan Clare Hammer Hammer By Ryan Clare Weight NA Drop NA	15.
Sample/Core Depth (feet below land surface) Core Recovery	
From To (inches) USCS Sample/Core Description	
U 4 SM STI (U-)" BROWN VE Sand and Silf treac loc	5-1
Sand & glandos angular, dry, losse, losts	
(1-4) SAA; Gray	
SII (9-18) SPA; Grayish orown, little treatment	<u> </u>
rock spread throughout. OF MARCATION GROED &	• r
- (10 Sqs.	
18-37) The Horder - Very die brown to	_
Disch ut Sad + Silt mixed with Sles,	
concrete, led briek, trea grandes to la	
posses sub ang to sub randal, maist,	_
nd, dense	_
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ARCADIS Sample/Core Log

lite	< his	av (av	nal (a	mm din S	Drilling	Drilling	8-4-16
0081011	<u>,,,,,,</u>	4				Type of Sample/	
Fotal Depth I	Drilled	7	-Feet	Hole Diameter 🛛 🥏	inches	Coring Device	MACIO CON
of Coring De	vice	4	82			Sampling Inte	erval <u>9</u> feet
and-Surface	e Elev.		feet	Surveyed	Estimated	Datum	- NA Google
Drilling Fluid Drilling	Used	<u>NA</u>				Drilling Method	An beoplose
Contractor		nagle			Driller	Jett J	Helper
Prepared By	Ryan	Clare				Hammer Weight <u>NA</u>	
Sample/Core E feet below lan	Depth d surface)	Core					
From	То	Recovery (Inches)	03C2	Sample/Core Descrip	tion		
0	4	30	SM	(0-3") 80	own uf sm	A h sitt tra	a wash
				Coalse sand	1, din, lows	e, routs.	
			SM	(3"- 11") SA	A; arayish	brown, tre	a smell
				jebbles su	1 roundel.		
			SM	(11"-18") 1.	She brown u	IF sand + Sil	F. Inthe
				granks to	19 pobbles	angular to su.	l'angular,
				moist, la	se to mal	dense.	
				(8 - 30)	Dhe (cold []	the total brow	un ut Sand,
				trace silt	mixed w	ith slag, cool	, brich (Pinh
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Sample	ARCA e/Core	DIS Log					
Boring/Well	$\angle B$ -	-6	Project/No.	0408001	2.0000		Pageof
Site Location	ship	2 Cai	nal (ommons	Drilling Started	Drilling Completed	8-4-16
Total Depth	Drilled	4	Feet	Hole Diameter	inches	Type of Sample/ Coring Device	Macro Core
Length and I of Coring De	Diameter wice	4 .	+ 2"			Sampling Inte	erval <u>4</u> feet
Land-Surfac	e Elev.		feet	Surveyed	Estimated	Datum	
Drilling Fluid	Used	NA				Drilling Method	Geoprobe
Drilling Contractor	Noth	nagle			Driller	Jeff S.	Helper
Prepared By	Ryan	Clare				Hammer Weight <u>NA</u>	Hammer DropNAins.
Sample/Core I (feet below lar	Depth Id surface)	Core					
From	То	Recovery (inches)	USCS	Sample/Core Descripti	on		
0	4	34	SW	(0-14")	H. brown	fine sand 1 se	sme grandes
				to la poso	les, any h	o Jub ang, di	y loose.
				DEMARCA	TION GRED	O 14" bas	
			ML	(14"-24")	Dk brown	to black Sil	+ + vf
				Sard, mixe	A with coo	1, slag, word	pleas moist,
				md den si	to dens	e.	
				(24"-34")	Brownish	any + Gray	concrete.
				Plink brief	k, esh d	51=1. Ash1	slos in
				the she	e, dry, 1	oute	
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Sample	ARCA e/Core	DIS Log			<u></u>
Boring/Well	CB.	-7	Project/No.	04080012.0000	Page of
Site Location	Shi	p Can	nal Co	Drilling Drilling Drilling Drilling Drilling	ng pleted 8-4-16
Total Depth	Drilled	4	Feet	Hole Diameter inches Type of Sample Coring Device	Macro Cone
Length and I of Coring De	Diameter evice	4' 1	- 2"	Sam	pling Intervalfeet
Land-Surfac	e Elev.		feet	Surveyed Estimated Datum	
Drilling Fluid	i Used	NA		Drilling Method	and Geoprobe
Drilling Contractor	Noth	nagle		Driller Jeff	S
Prepared By	Ryan	Clare		Hammer Weight1	NA Drop NA ins.
Sample/Core I (feet below lar	Depth nd surface)	Core			
From	То	Recovery (inches)	DZC Z	Sample/Core Description	
0	4	32	SM	(0-18") H. Grayish brown vf	Sand + Silt,
				little granules to Ly pobles, a	ng to sub roundel,
				trace mic said, dry losse	DEMARCATION
				GRID @ 18".	
			ML	(18"-22") DK, Reddish brown	silt. some uf
				Sand, there granules, angular,	mised with
				slog + bilch pieces, don't very	SHAF
				(22"-32") Rlech cool nixed w	ith the dlive
			ML	brown silt trea clay, trac	e granuls to
				md, pobles, sus and, dry lo	ose to stiff
				, , , , , , , , , , , , , , , , , , , ,	
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Sample	ARC/	ADIS e Loa				
Boring/Well	CB	- 8	Project/No.	04080012.0000		Page of
Site Location	But	ffolo	NY	Drilling Started	Drilling Completed	8-4-16
Ship (A		comm	Feet	Hole Diameter 2 inches (Type of Sample/	MACTO Core
Length and	Diameter	1				. U
of Coring De	evice e Flev	9	feet	Surveyed Estimated [Sampling Inte	rval 1 feet
Drilling Fluid	Used	NA			Drilling Method	Se Geoprobe
Drilling Contractor	Not	hnagle		Driller	Jeff S.	Helper
Prepared By	Ryan	Clare		ŀ	Hammer Weight NA	Hammer Drop <u>NA</u> ins.
Sample/Core I (feet below lar	Depth nd surface)	Core Recovery	USes	Samela/Caro Departmin		
	4	(Incries)	SM	(0-6") H. brown VF 5a	nd o silt.	liftle grandes
				to la possiler any to	325 rounded	+race
				mac said, dry lasse		-
			SM	(6"- 11") SPA; Gray		
			SM	(11"-21") Brown VF 5.	ad + silt	little
				granus to 19 poblos, an	y to sub a	ng trace
				clay, trace f-m Sard,	maist van	j'dense.
		_	59	(21'-23") It. bown fim	e sand, di	y losse and
				1.5" die stone. 📾 DEMA	RCATION GI	rid of
-				23" 695.		
		Ţ	SM	(23"-23") Phe brown to b	lach vf Sord	+ silt mixed
ļ				with slog 2 coal ment	Gaare	
	<u> </u>		CL	(27 - 33") D4 brown cla	y, little si	17, tey brittle
			-	dry hard.		
			-	(33 - 95") Bleck + Dk brows	- 5/-9, (0-1	, 1och, +
				gloss pieces dy loses		
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FUE	ARCA	DIS		
Sample	e/Core	Log		
oring/Well	CB-	9	Project/No.	04080012,0000 Page 1 of 1
ite ocation	Ship	Car	nal Co	Smmdhs Drilling Drilling Completed 8-4-16
otal Depth I	Drilled	3.5	Feet	Hole Diameter 2 inches Type of Sample/ Coring Device Macro Core
ength and D f Coring De	Diameter vice	4'	+ 2"	Sampling Intervalfeet
and-Surface	e Elev.		feet	Surveyed Estimated Datum
rilling Fluid	Used	NA		Drilling Method
ontractor	Noth	nagle		Driller Jeff S. Helper
repared y	Ryan (Clare		Hammer Hammer NA Drop NA ins.
ample/Core D	Depth d surface)	Care		
rom	То	Recovery (inches)	USCS	Sample/Core Description
0	3.5	35	SM	(0-10") It. brown grades to gray uf sand
				and silt, trace course sand + granules, any
				to July and, dry, loose, routs.
			ML	(10"-16") Brown Silt & UF Sand, trau to
				little son to 19 pesses sub any to sub rand
				moist & dry, mol dense to dense. DEMARCATI
				GRED of 16" bas
			SW	(16"-35") Rust reddish brown fine send, littly
				sin to 15 pobles, ons, dry, losse, mixed
				with sleg, cod, = ash, + wood piecos,
				lots of slag 31"-35" refused on concrete
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Sample	/Core	Log						
Boring/Well	(5-1	0	Project/No.	0408001	2.0000		Pageof	_
Site Location	ship	? Car	nal (ow	nmans	Drilling Started	Drilling Compl	eted <u>6-4-16</u>	_
Total Depth D	Drilled	4	Feet	Hole Diameter	,inches	Type of Sample/ Coring Device	Macro Co.	٩
Length and D of Coring Dev)iameter /ice	<u> </u>	7 7 .			Sampl	ing Interval <u>4</u> feet	
Land-Surface	e Elev.		feet	Surveyed	Estimated	Datum		_
Drilling Fluid	Used	NA				Drilling Method	Geopro.	<u>5</u> C
Drilling Contractor	Noth	nagle			Drille	r Jeff S	Helper	_
Prepared By	Ryan (Clare		·		Hammer Weight N	A Hammer NA ins.	
Sample/Core D (feet below land	epth I surface)	Core						
From	То	recovery (inches)	USCS	Sample/Core Descript	lion			-
0	4	45	SM	(0-6") It.	brown vf	Sand and	silt, trau	
		· ·		granules to	o (7 posse.	s, ang to s	us ansola, dry	4
				Youse, roof	Σ.	~ /		
			SM	(6"-H") SA	A' Gray	little gran	nder.	
			SM	(11-27)	Some uf	End + Sil	+ I: Whe to some	
		<u> </u>		a court to	1. Apples	are to tak	me mist	
-				glandes in	15 posses,	- C-RIA	st 27" bas	1
		<u></u>		(17"-45")	Rede L	NK elan sl	the coal word	
					inter halale		la la se lite	
				fields (1	un orren,	and san, i	19, 100 JC . 101 J	-
			+	07 5/49 C	nutes in	the share.		-
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9		DIS		
Sample	e/Core	e Log		
Boring/Well	CB-	11	Project/No.	04080012.0000 Page of
Site Location	Bof	falo,	NY	Drilling Started 8/4/16 Drilling Completed 8/4/16
Total Depth	Drilled	4	Feet	Hole Diameter 1 inches Type of Sample/ Coring Device Macro Core
Length and of Coring D	Diameter evice	4' 8	- 2	Sampling Interval 4 feet
Land-Surfa	ce Elev.	_	feet	Surveyed Estimated Datum
Drilling Flui	d Used	NA		Drilling Method
Drilling Contractor	Noth	nagle		Driller Jeff S. Helper
Prepared By	Ryan	Clare		Hammer Hammer NA Ins.
Sample/Core	Depth	Core		
From	To	Recovery	USCS	Sample/Core Description
	4	45	SM	(0-8") 17. Brown vf Sard + silt tran grante)
				to me pobles and to sub and dry loose
			SM	(8"-10") SAD: Gryish brown
			SM	(0"-14") SAA: little to rome md - (a pebbles,
				maist
			ML	(14"-23") Brown Silt & uf Sand liftle grownly
				to le pobles and to sub and prittle maistle
				dry very dense DEMARCATION GRED @ 23" bgs.
			ML	(23"- MA 33") Black Silt some vf Sand
				tak clay mixed with cool, esh, + slag.
				maist loase to Hord
		1	-	(33"-36") Rink send stone cryshed.
	1		1	(36"-95") Black coal, slas fling sad minud
			-	became modif. very dense
		1	<u> </u>	
		-	1	
	+			
	1			
			<u> </u>	
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fabrie at 23"

O		DIS			
Sample		Log		64- 20010 ANAT	1
Boring/Well		2	Project/No.	Ogo 30012, 0000 Page of	
Site Location	Shi	p Ca	anal (Commons Started Completed 8-9-16	
Total Depth	Drilled	4	Feet	Hole Diameter A inches Type of Sample/ Coring Device Macro Co.	1e
Length and lof Coring De	Diameter evice	4'	- 2	Sampling Interval 4 fe	et
Land-Surfac	e Elev.		feet	Surveyed Estimated Datum	
Drilling Fluid	Used	NA		Drilling Method	36e
Drilling Contractor	Noth	nagle		Driller Jeff S Helper	
Prepared By	Ryan	Clare		Hammer Hammer NA Drop NA in	IS.
Sample/Core (feet below lar	Depth nd surface)	Core	4		
From	То	(inches)	USCS	Sample/Core Description	
0	4_	45	SM	[0-6") It. brown uf Sand & silt, trace grand	-2
	-			to mal pobles say ong to sab foundal, dig,	_
-			< 1	100 Se (asts.	_
			517	closer s'it	-
			ML	(12"-24") matthed can + reddlich brown Si	11
				+ clay brittle day ven stiff. DEMARCA	TINN
				GROD 47 244	
			+-	(24"-43") Black + Oh Gray vf-f Sad; too	
		<u> </u>		Silt mixed w/ slag cool, ash, moist,	_
				loose to very dense	_
					_
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ARCADIS Sample/Core Log

Sample		LUY						
Boring/Well	CB-	13	Project/No	04080012	2.0000		Pageof	
Site Location	Shi	p Co	inal	(ommons	Drilling Started	Drilling Completed	8-4-16	
Total Depth	Drilled	4	Feet	Hole Diameter	inches	Type of Sample/ Coring Device	Macro Core	
Length and I of Coring De	Diameter vice	41	+ 2"			Sampling In	terval <mark>4</mark> feet	
Land-Surface	e Elev.	/	feet	Surveyed	Estimated	Datum		
Drilling Fluid	Used	NA				Drilling Method	What Geoprobe	
Drilling Contractor	Noth	nagle			Driller	Jeff S.	Helper	
Prepared By	Ryan	Clare				Hammer Weight NA	Hammer NA ins.	
Sample/Core E (feet below lan	Depth d surface)	Core						
From	То	(inches)	USC5	Sample/Core Descripti	ion			
0	4	39	bane:	SH (0-7") 1t.	brown vf s	and & Silt, t	mice grandes	
				to la pebble	is any to :	sub any diy.	losse	
			SMM	(5"-13") SA	A; Grey , +	mae to little a	sendes,	
			- 65	(13"-19") BA	own silt +	vf Sard trace	to little	
				grander to	o mol. pabb	les, sub ang,	molst, vary	
				dense				
			ML	(19"- 39")	Dk granish	brown fine	Sand, trace	eill
				La little e	conder to	la pebbler an	s he sub \$	stalls
				(ander	ander to	(ust led "che	At like	
				stane or	size mater	A.		
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Sample/Core Log

e	shil	s ca	nal (annons	Drilling Started	-	Di	rilling ompleted	8.	- U -	Ь
tal Danih	Drillod	u	Foot	Holo Diameter		_	Type of Sam	ple/	Ma	() m	Core
noth and	Diameter		N				Coming Donio	0		()	
Coring De	evice	9.4	6					ampling Inf	erval	4	feet
nd-Surfac	e Elev.		feet	Surveyed	Estimated	ł	Datum			6.00	0000
illing Fluid	Used	NA					Drilling Metho	ba		00	prose
ontractor	Noth	nagle				Driller	Jeff	<u>S.</u>	Helpe		
repa red /	Ryan	Clare				_	Hammer Weight	NA	Hamm Drop	NA	ins.
Imple/Core I et below lar	Depth nd surface)	Core Recovery		-							
om	То	(inches)	0503	Sample/Core Des	cription						
0	4	59	SM	$\left(0, 6^{\circ}\right)$	It. brown	UF S	and t Si	17 <u></u>	n Le	grand	h5_
				to small	pebbles i	ang h	sub lan	deal, a	lig,	003	
		ļ	ļ	routs.		•					
		<u> </u>	SM	(6"-15")	SAA; I:H	h 1;	pebbles	t ang	ular		
		<u> </u>	SM	(5"-19")	Brown \$	vP s	and + Si	nty:	Som	19	
				peyses, a	msular (frac	Arned	Rook), a	try,	md.	den	se.
			-	(19" - 39	") ph le	dis	h Coraly	fine	Jad	mis	al 1
				with 57.	ng brich,	+ (0	<u>al, Śi</u>	17 7	Coel	in .	the
				share, a	dry to m	noust	loose	to	Ver	, str	FF _
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Ø	ARCA	DIS			
Sample	e/Core	Log			
Boring/Well	CB-	15	Project/No.	04080012.0000	Page of
Site Location	Shi	p Ca	nal (ommons Drilling	Drilling Completed 8-4-16
Total Depth	Drilled	4	Feet	Hole Diameter inches	Type of Sample/ Coring Device Macro Core
Length and I of Coring De	Diameter vice	4	+ 2"		Sampling Interval
Land-Surfac	e Elev.	-	feet	Surveyed Estimated	Datum
Drilling Fluid	Used	NA			Drilling Method
Drilling Contractor	Noth	nagle		Uriller	Seff S Helper
Prepared By	Ryan (Clare			Hammer Hammer NA Drop NA ins.
Sample/Core I (feet below lan	Depth d surface)	Core Recovery	11505		
From	То	(inches)	0303	Sample/Core Description	
0	9	58	SM	(0-11") It. brown uf San	d & silf little f-m
				Sandy trace grows has	mal polbles, and to sub
				angular, dry loose.	
			SM	(11"- 18") SAA; Gray	
				(19"-25") Roman Silt + V	A Sand : trace to Ville
				acculat la la lalitat a	a l ful or al Ma
				Latte hard	is to ses land, org
			SM	(25°-30") He brown wf-	Sent the The
				little granules to und	pobbles and to seib and
				them silt day mad	denie DEMARCATION
			· · · · · · · · · · · · · · · · · · ·	GETD at 30" bar	
1			-	(30"- 2g") Fill moto	sid - som -sh/slas
				on the of a pink son	1 + gloval materia
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9		DIS								
Sample	e/Core	Log								1 I
Boring/Well	<u>CB-1</u>	6	Project/No.	040800	12.0000				Page	of
Site Location	Shi	P Co	anal G	ommons	Drilling Started			Drilling Completed	B-	.4-16
Total Depth	Drilled	4	Feet	Hole Diameter	<u> </u>		Type of Sa Coring Dev	mple/ ice	Mac	n core
Length and I of Coring De	Diameter evice	4'	+ 2"				_	Sampling Int	erval	<u> </u>
Land-Surfac	e Elev.	_	feet	Surveyed	Estimated	ł	Datum			
Drilling Fluid	Used	NA					Drilling Me	thod	S	Geoprobe
Drilling Contractor	Noth	nagle				Driller	Jeff	S.	Helpe	
Prepared By	Ryan	Clare				_	Hammer Weight	NA	Hamrr Drop	NA ins.
Sample/Core (feet below lar	Depth nd surface)	Core								
From	То	Recovery (inches)	USUS	Sample/Core D	escription					
0	4	32	SM	(0-7")	1t. brow-	- vf	Sal	L 5117	, tre	a grante
				to md.	pebbles on	9 to 5	ub ang	dry	1000	P, rocks
			SM	6" - 11")	SAA; Gray					
			SM	("-1-")	Brown uf	Sand	4 2:11	-, trac	910	mles to
				1- pebble	s. cmg to	515 (a	indeal,	dry	md.	donse.
				DEMAR	ATION LE	LID A	+ 17	" 6gj	•	
				(17"- 32	") nh (ea	11sh	brew.	n fine	. Saw	of mixed
				W/ Slag	+ bliele	(Sear	n of c	layer	5.17	25-28"
				har) H.	nollar bi	tch /s	tan !	The	Sha	• •
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	Sample	e/Core	LOG									
Site Drilling Poiling Stated Drilling $g_{-1}^{-1}B_{-1}^{$	Boring/Well	<u> </u>	7	Project/N	o. 040	8001	2 0000	۷			Page	of
Total Dophi Drilled 4 Feet Hole Diameter 2 inches Type of Sample/ Config Device MACIO (Drig Config Device Length and Diameter 4 Y Y Sampling Interval 4 feet Land Strings Elev. feet	Site Location	<u>Sh</u>	ip (canal	Commo	n 5	Drilling Started			Drilling Completed	8 -	- 4-16
Length and Demeter U't t' Surveyed Estimated Datum Sampling Interval U feel Land-Surface Elev	Total Depth	Drilled	4	Feet	Hole Diamet	er 구	inches		Type of Sa Coring Dev	imple/ /ice	Ma	cro lore
Land-Surface Elev feet Surveyed Datum Datum Datum Datum Datum Datum Datum	Length and I of Coring De	Diameter vice	4	+ 2"					_	Sampling Inf	terval	4_feet
Drilling Fluid Used NA Drilling Method $Marchard Corrector NA and Care Drive NA and Care Nammer NA dammer NA and $	Land-Surfac	e Elev.		feet	Surveyed		Estimated		Datum			
Driller By Notinagle Driller Jeff S. Helper Prepared By Ryan Clare Hammer Weight NA Hammer NA Hammer NA Ins. Prepared By To Core Recovery USCS Sample/Core Description O 9 911 Small Core Recovery USCS Sample/Core Description O 9 911 Small Core Recovery USCS Sample/Core Description Image: Core real SM (6''-10'') SAA: Gray Gray Gray Image: Core real SM (6''-10'') SAA: Gray Gray Hammer Meight January Image: Core real SM (6''-21'') Brown UF Sand & Silt, free granubs Image: Core real SM (6''-10'') SAA: Gray Image: Core real Image: Core real Image: Core real SM (6''-10'') SAA: Gray Image: Core real Image: Core real Image: Core real SM (6''-10'') SAA: Gray Image: Core real Image: Core real Image: Core real SM (6''-10'') SAA: Gray Image: Core real Image: Core real Image: Core real SM (10'') SAA: Gray Image: Core real Im	Drilling Fluid	Used	NA						Drilling Me	thod	NO Y	Geoprobe
Propert Ryan Clare Hammer NA Hammer NA Hammer NA Hammer NA Hammer NA Ins. By deposition Contention Contention USC 5 Sample/Core Description Image: To Contention USC 5 Sample/Core Description Image: To Contention VSC 5 Sample/Core Description Image: To Contention VSC 5 Sample/Core Description Image: To SM (1-10") SAA: Gray Image: To SM (1-10") Saad to Sand to Site, and and	Drilling Contractor	Noth	inagle					Driller	Jeft	<u>S.</u>	Helper	
Sample Core Recovery USCS sample Core Description From To (Recovery USCS sample Core Description O 4 41 SM (0-8") 17. brown vf Sand + Silt, tree growthe k smooth pobles, and to see a rounded, dry, loase, codts. SM (6"-10") SAA: Gray SM (6"-21") Brown vf Sand + Silt, tree growthes to 1g pebbles, and to see any, moist, dense to very dense. Discreption of black fine Sond, mixed SP (28"-28") Var 11. Gray for Sond and Sizg like SP (28"-33") Var 11. Gray for Sond and Sizg like (32"-11") Black carl publes, dry, loase. (32"-11") Black carl publes, dry, loase. (32"-11") Black carl publes. (32"-11") Black carl publes. (33"-11") Black carl publes. (34"-11") Black carl publes. (34	Prepared By	Ryan	Clare					_	Hammer Weight	NA	Hamm Drop	er <u>NA</u> ins.
10 (1000) (1000) (1000) (1100)	Sample/Core I (feet below lan	Depth nd surface)	Core Recovery	y USC	Somple/Co	ra Descriptio	10					
In the second of the second		U	<u>(Incres)</u>	T KA	Gampleroo	14	h	f For	1180	L for		and the for
SM (1"-16") SAA: Gray SM (1"-16") SAA: Gray SM (10"-21") Brown UF Sand & Silt, trace graneles to 1g pebbles, ang to rob ang, malist, dense to Very durse. Dismarcation are 21" by s - (21"-28") Dk brown & black fine Sand, withed W1 (col, slag, & Lood flees, dry, 10032. SP (28"-30") very 1t. Gray f-m Sand and Slag like Grand - und -12 pebbles, dry, 10032. (32" 41") Black coal pswder 				2		<u>) -</u>	brown 1	1 344	01 0- 211	111	<u>c 910</u>	and the
SM (6 -16') SQA; Gray SM (6 -21'') Brown uf Sand + Silt, trace granues to 1g pebblos, ang de sob ang, molist, dense to very dense. Dismarcation are D at 21" bgs - (21"-28") Dk brown + b) ach five Sond, mixed w/ coal, slag, + wood pleas, dry, losse. SP (28"-30") very (t. Gray f-m Sand and Slag like are on - and -1g pebbles, dry, losse. (32" 91") Black coal powday 			-		Smoth	10654	s, and	65	25 / 304	notal, di	19,100	JE, 10015,
SM (10"-21") Brown ut Sandt Silt, tree grantes to 1g pebblos, ang to sub ang, malist, dense to very dense. Dismarcation and of 21" bgs - (21"-28") Dk brown t black five sond, inited w/ coal, slag, t yead pleas, dry, losse. SP 28"-32") very 1t. (may f-m Sand and Slag like and - md - 1g pebblos, dry, losse. (32"-41") Black coal powday				<u> </u>	1 6 - 10"	<u>) 546</u>	t; Gray	0				
to 1g poblics, ang de sub ang, maist, dénse to veny dunge. Dismarcation and of 21" bgs - (21"-28") Die braun + black fine sond, mined w/ coal, slag, + wood pleas, dry, losse. SP (28"-30") very 1t. (may f-m Sond and slag like connel - mid -1g pobles, dry, losse. (32"-11") Black coal punder 				Sr	5-"01/1	(*) <u>Br</u>	own j	f Sa	nd 7 Si	1+, tr	4 9	andos
very duse. Dismarchi is a crib at 21" bys - (21"-28") Die braun & black five sand, mited w/ (oal, slag, & wood pleas, dry, losse. SP (28"-32") very (t. Gray from Sound and slag like Grand - and -13 pessels, dry, losse. (32" 41") Black coal powder 					to 19	po5565	, ang d	0 505	ang,	molit	der	ise to
- (Di"-28") DK brown + black fine Sond, mined w/ (oal, slag, + Wood pieces, dry, loose. SP (28"-32") vary 14. (ray f-m Sound and slag like Grand - md -13 pessies, dry, loose (32"- 191") Black coul powder 					Ven	dense	DEM	ARCA	TION	CRID	at 2	1" bg 5
$\frac{1}{3} \frac{1}{3} \frac{1}$					A"-2	28")	Sk Sm	m t	blach	fine 5	and	wheel
SP (28"-32") vary (t. Gray f-m Scard) and Sl <q (32"-="" -="" -15="" 10030="" 91")="" black="" cord="" dry,="" grand="" ind="" like="" pessles,="" powder<="" td=""><td></td><td></td><td></td><td></td><td>Lul Co</td><td><u></u></td><td>les di</td><td>Lichad</td><td>Aiecos</td><td>de</td><td>0058</td><td></td></q>					Lul Co	<u></u>	les di	Lichad	Aiecos	de	0058	
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$ \begin{array}{c} $				>\	18-50		47 (T. 0		<u> </u>	scing	-101	31-) 11/4
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	<u> </u>				Grind	- md	<u>1-15</u>	espri	, any	19275	<u>.</u>	
Image: Section of the section of th		ļ	<u> </u>		132 . 9	<u>1") </u>	ach los	1 pon	der			
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Sample/Core Log BorngWeil CB-18 Project/Na 0408 0013.0000 Page 1 of She Ship Canal Canmons Dilling Completed 8-4-1b She Completed 4 Feet Hole Demeter - Intres Completed 8-4-1b Total Depth Drited 4 Feet Hole Demeter - Intres Sampler Macco Core Control Drited 4 Feet Isure Dilling Method 188 600 Probe Driting Fluid Used Nathragle Lureer Isure Isure Isure Hammer Na Hole Probe Ording Ording Nothragle Used Isure Isure Isure Isure Isure Hammer NA Hole Probe Ording Weit use schendy Cost Sample/Condition Deprotein Issue	9	ARCA	DIS				·
Boring/Weil <u>CB-18</u> Projective. <u>0408 0012.0000</u> Page <u>1</u> or <u>1</u> Site <u>Coston</u> <u>Ship Canal commons</u> <u>Drilling</u> <u>Completed</u> <u>8-4-16</u> Total Denter <u>4</u> Foot Hole Denter <u>2</u> inches <u>Type of Sampler</u> <u>Macro Core</u> <u>Completed</u> <u>14 2⁴¹</u> <u>total</u> <u>Sampling Interval</u> <u>4</u> tool Land-Burker <u>14 2⁴¹</u> <u>total</u> <u>Sampling Interval</u> <u>4</u> tool <u>Contradoutic</u> <u>16000000000000000000000000000000000000</u>	Sample	e/Core	Log				
Sile Ship Canal Commons Shires Dilling	Boring/Well	CB-1	8	Project/No.	04080012 0000		Page of
Total Depth Drilled 4 Feet Hole Diamoder 2 inches Type of Sample/ Comp Optice Macro Coile Langth and Diamoder 1 4 N Sampling Interval 4 reet Langth and Diamoder 1 4 N Sampling Interval 4 reet Langth and Diamoder 1 N Total Diamoder 1 1 reet Langth and Diamoder NA Total Diamoder 1 1 reet 1 reet Langth and Diamoder NA Total Diamoder 1 1 reet 1 reet Drilling Fluid Used NA Total Diamoder 1 Sample/Core Diamoder 1 1 reet 1 1 reet 1 1 nm. 1 nm. 1	Site Location	Shi	p Co	mal	Commons Drilling Started	Drilling Completed	8-4-16
Length and Discrete: $U' + X''$ sampling Interval U' rect and Surface Devices V_A for $U' + X''$ sampling Interval U' rect Diffing Fluid Used N_A Diffing Fluid Used N_A for N_A ins. Diffing Fluid Used N_A Diffing Method M_A (correction) Properties N or N_A ins. Sampling Correction N_A ins. Sampling Correction N_A ins. Diffing N_A (correction) N_A ins. Diffing N_A (correction) N_A ins. Diffing N_A (correction) N_A ins. Diffing N_A (correction) N_A (corr	Total Depth	Drilled	4	Feet	Hole Diameter inches Type of Coring	f Sample/ Device	Macro Core
Land-Surface Elev toet surveyed Estimated Datum Drilling Fluid Used NA Drilling Fluid Used NA Drilling Method Sign flow Script for Prepared NA NA MA Ins. Sample/Core Depth (ince table using Core Feen To Core Feen To Core MA Sign flow Script for MA Sign flow Script for MA Sign flow Sign flowSign flow	Length and I of Coring De	Diameter wice	NA	2"		Sampling Int	erval <u>4</u> feet
Drilling Fluid Used NA	Land-Surfac	e Elev.		feet	Surveyed Estimated Datum		
Drilling Bortheador Nothnagle Driller JCff S. Helper Prepared By Ryan Clare Hammer Weight NA Hommer NA Ins. SimpleCore Depti- (text balow lind suffee) Core Recovery USCS SampleCore Depcified To Y Y 8 SM (O - S ⁻¹) It. bostom Vf Sond + Silt, tree gravity of Sm pebbles, orng to sub ang, dry, fraze. SM S ⁻¹ (a ⁻¹) SAR (S ⁻¹ (a ⁻¹) SAR; Crany ML f(a ⁻¹ - 3S ⁺¹) Gravity Sond + Silt, tree agravity of Sm pebbles, orng to sub ang, dry, fraze. SM S ⁻¹ (a ⁻¹) SAR; Crany ML f(a ⁻¹ - 3S ⁺¹) Gravity ML f(a ⁻¹ - 3S	Drilling Fluid	Used	NA		Drilling	Method	the beoprobe
Prepared By Ryan Clare Hammer Weight NA Hammer Drop NA O Y YS Semple/Com Description O Y YS SAM (O-5") It. bown vf Sand + Silt, trea granus do sm pobbles, ong to sub ang, dry, fause. Image: Sample/Com Description SAM (S -10") SAR (S -10") Sample/Com Description Image: Sample/Com Description Sample/Com Description Sample/Com Description Image: Sample/Com Description Sample/Com Description Sample/Com Description Image: Sample/Com Description Sample/Com Description Sample/Com Description Image: Sample/Com Description Sam pobbles, ong to sub ang, dry, fause. Sample/Com Description Image: Sample/Com Description Sam pobbles, ong to sub ang, dry, fause. Sam pobbles, ong to sub ang, dry, fause. Image: Sample/Com Description Sam pobbles, ong to sub ang, dry, fause. Sam pobbles, ong to sub ang, dry, fause. Image: Sample/Com Description ML (o" - 25") Granish brown Silt + vf Samd, tread Sample/Com Description Image: Sample/Com Description Image: Sample/Com Description Sample/Com Description Image: Sample/Com Description Image: Sample/Com Description Sample/Com Description Image: Sample/Com Description Image: Sample/Com Description Sample/Com Description Image: Sample/Com Desc	Drilling Contractor	Noth	nagle		Driller Jc	ft S:=	Helper
Sample Core Deptition To Core (Recovery USCS Sample Core Description To To (Recovery USCS Sample Core Description O 4 48 SM (0-5") It. bour vf Sand + Silt, trea granned to Sm pebbles, ang to sub ang. dry, lease. ML (a" - 25") Granish brean Silt + vf Sand, trea do liftle grants to 1g pebbles, ang to sub armal. ML (a" - 25") Granish brean Silt + vf Sand, trea ML (a" - 25") Granish brean Silt + vf Sand, trea ML (a" - 25") Granish brean Silt + vf Sand, trea ML (a" - 25") Granish brean Silt + vf Sand, trea ML (a" - 25") Granish brean Silt + vf Sand, trea ML (a" - 25" (35") Granish brean Silt + vf Sand, trea ML (a" - 25" (35") Granish brean Silt + vf Sand, trea ML (a" - 25" (35") Granish brean Silt + vf Sand, trea ML (a" - 25" (35") Granish brean Silt + vf Sand, trea ML (a" - 25" (35") Granish brean Silt + vf Sand, trea ML (a" - 25" (35") Granish brean Silt + vf Sand, trea ML (a" - 25" (35") Granish brean Silt + vf Sand, trea ML (a" - 25" (35") Granish brean Silt + gran ML (a" - 25" (35") Granish brean Silt + vf Sand, trea ML (a" - 25" (35") Granish brean Silt + vf Sand, trea ML (a" - 25" (35") Granish brean Silt + vf Sand, trea ML (a" - 25" (35") Gran grading to dhe (ethigh bream ML (a" - 25" (35") Gran grading to dhe (ethigh bream ML (a" - 25") (and the second site grains). MR (and the second site grains). MR (and the second site grains). MR (Prepared By	Ryan (Clare		Hammo Weight	er <u>NA</u>	Hammer <u>NA</u> ins.
From To Recovery USCS SampleCons Description (Inches) SM (0-5") It. bosom vf Sand + Silt, trea granuly de SM (5"-10") SAR; comy ML (0"-25") Compish brown Silt + vf Sand, trea de little grants to la pobles, ang to sub rankel maist, very Stift to hard. DEproperation GR(D et 25" byt - 25"-48") Birch grading to dk (eddigh brown Slag d cost power (\$ fine sand Size grains), dry, lags.	Sample/Core I (feet below lan	Depth Id surface)	Core				
0 4 48 SM (0-5") It. bown vf sond + silt, trea grandes de sim pobbles, ang to sub ang, dry, lasse. SM (5"-12") SAR; crany ML (10"-25") Grayish brewn Silt & vf Sand, treas de little grands to lg pobbles, ang to sub anded, maist, very stiff to hard. DEMARCATION GRID et 25" byt - 25"-48") Block grading to dk (editab brown slast d cost powder (s fine sand size grains), dry, lasse. 	From	То	Recovery (inches)	USCS	Sample/Core Description		
sm pobbles, and to sub any, day, loose. SM (5-10) SAR; cray ML (10"-25") Crayish brown SII + Vf Sand, treas do little grants to 1g pobbles, and to sub randel maist, very stiff to hard. DEprogramman GRID et 25" byt - (25"-98") Block grading to dk (eddigh brown Slag & coal gowder (\$ fine sand Size grains), dry, lease. 	0	4	48	SM	(0-5") It. bown uf Sand +	silt. to	o a grandy to
SM (5-10') SAA; comy ML (0"-25") Comish brown Silt + 45 Sand, free do little grants to 1g pobles, and to sub control moist, very Stiff to hard. DEMARCATION GRID of 25" byt GRID of 25" byt 					sm pebbles, and to sub and, a	log, logs	Te,
ML (10"-25") Granish brown Silt + vt Sand, trees do little grants to /g pottos, ang to sub aneal moist, very stiff to hard. Depayeestron 				SM	(5-10") SAA; Gran		
b little grants to la polities, and to set and maist, very stiff to hard. Depageation GRID et 25" by - 25"-98") Bleck grading to dk (eddish brown slag & coal powder (s fine sand size grains), dry, lacese.				ML	(10"-25") Grayish brown Si	17 + vf	Sand, fread
Invaist, very Stiff to hand. DEMARCATION GRID et 25" by - (25"-98") Block grading to die (eddige brown Slag & cool gowder (s fine sand size grains). dry, laure.					to little grandes to /g poble	s, ang h	sub randal
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $					maist very stiff to hard.	DEMAR	CATION
- (25"-48") Bleck greding to die leddish brown slez & caol powder (\$ fine rend size greins). dry. /care.					GRID ++ 25" 675		
sleg & cael powder (\$ fine send size greins), dry,/case.			1	_	(25"-48") Black greding to	dh (etd	18h brown
					slag & coal powder (s fine	send st	ze groins)
					dry, lasse		
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febrie at 25" bgs

Sample		DIS										
Sample		LUG I A		12110500	12 000							
Boring/Well	<u>CD-</u>	1	Project/No.	040800			Drilling	Page of				
Site Location	Shil	p Cau	nol (c	mmanz	Started		Completed	8-4-16				
Total Depth	Drilled	4	Feet	Hole Diameter	Linches		Type of Sample/ Coring Device	Macro Core				
Length and I of Coring De	Diameter vice	4+	2"				Sampling Inte	erval <u>4</u> feet				
Land-Surface	e Elev.		feet	Surveyed	Estimated		Datum					
Drilling Fluid	Used	NA					Drilling Method	al cropase				
Drilling Contractor	Noth	nagle				Driller	Jeff S	Helper				
Prepared By	Ryan	Clare				_	Hammer Weight <u>NA</u>	Hammer NA ins.				
Sample/Core I (feet below lan	Depth Id surface)	Core										
From	То	(inches)	DZCZ	Sample/Core Descrip	ption							
0	4	38	<u>SM</u>	(0-5")/t.	brown	of Sci	nd & Silt, free	e graviles,				
				angular, d	14, 10050	<u>.</u>						
	<u> </u>		SM	(5-9") SA	A; Gray							
			ML	(9"-15") Gr	reyish be	the second	Silt + Vf Jav	od; frece				
				grandes, su.	s angular,	PUS	Le, dry, loose	to mol.				
	den se.											
				(5"-17")	Gray for	ctime	1 store					
			ML	(17"-38")	Black +	<u>d</u> 4 1	somen Silt, 11	the up sad.				
				mixed wi	1 coal +	powde	not slag, dry	, losse				
		1				-						
			·									
							· · · · · · · · · · · · · · · · · · ·	·				
		l										

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ARCADIS Sample/Core Log

Boring/Well	CB-:	20	Project/No	040	800	12.000	O			Page		of
Site Location	Shi	p Co	anal	(on mo	ns	Drilling Started	_		Drilling Completed	8-	4-11	>
Total Depth	Drilled	4	Feet	Hole Diamete	er <u>2</u>	inches		Type of Sa Coring De	ample/ vice	M	acro	Core
Length and I of Coring De	Diameter vice	4	+ 2"					_	Sampling In	terval	4	feet
Land-Surface	e Elev.	/	feet	Surveyed		Estimated	ł	Datum				
Drilling Fluid	Used	NA						Drilling Me	thod	No.	Geo	2prob e
Drilling Contractor	Noth	nagle					Driller	Seff	S.	Helpe	r	
Prepared By	Ryan	Clare					_	Hammer Weight	NA	Hamm Drop	NA	ins.
Sample/Core [(feet below lan	Depth d surface)	Core Recovery	1.54									
From	То	(inches)	1250	Sample/Co	e Descripti	ion						
0	4	41	SM	(0-6"	<u>) ł.</u>	bran-	JF S	and t	silt	trace	5(0	rules
				tu sm	all p	obses, a	~s to	506 1	andal,	dry,	ford se	<u>.</u>
			SM	(6"-11") <u>SRI</u>	+; Gray						
			ML	(11-20	") Br	dwn Si	1++ 1	if San	d. tree	e to	liH	He
				glande.	s to	(3 po 336	s, an	a to se	it ang	brit	the.	
				diyt	s md	lyt, de	stit	f de ve	en sti	IFF.	5000	tons
				frietu	ul,	recht. D	EMAR	CAT ION	GRIG) st	20"	ber
			SM	20"-3	6")	Black to	dhe ro	ddish	1 mun	vf.	5 san	4
				mixed	1 4/	The .	- Colar	Poulo	ter d	14	100.70	> Wood
				(36"- 4	·") U	en It. (iran t	Sector	a sto	ine	+ 310	al ash
				mater	· Iol .	d17.1	oore				• •.	
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Sample/Core Log

Sample		LUG						
Boring/Well	CB-a	21	Project/No.	040800	000 610	0		Pageof
Site Location	Shi	p Ca	mal Co	mmdns	Drilling Started	_	Drilling Completed	8-4-16
Total Depth I	Drilled	4	Feet	Hole Diameter	inches		Type of Sample/ Coring Device	Macro Core
Length and E of Coring De	Diameter vice	4'	+ 2"				Sampling In	terval <u>4</u> feet
Land-Surface	e Elev.	/	feet	Surveyed	Estimated		Datum	
Drilling Fluid	Used	NA					Drilling Method	A Groprobe
Drilling Contractor	Noth	nagle				Driller	Jeff S	Helper
Prepared By	Ryan	Clare					Hammer Weight <u>NA</u>	Hammer Drop <u>NA</u> ins.
Sample/Core I (feet below lan	Depth d surface)	Core						
From	То	(inches)	USCS	Sample/Core Desc	ription			
0	4	38	SM_	(0-4") 14.	brown vf	Sand	+ SIIt, trace	grandes to
		,	· ·	son pobles	ang to se	is ang	, dwy, loose	
			SM	(4"-8") SA	A; Gray,	little	groudes to s	m pobbles
			SM	(8"-17") h	f. brown	uf Sa	and, t Silt, "	tren de little
				groules f	o la pobble	s, av	ng to sub round	al dry, loose.
				DEMARCAT	CTIMD UNI	at	17" bys	
-			SW	$(7^{-}38^{+})$	Black a	(alies	to dhe sedo	lish brown
				fine Sant	12the a	rand	to is possibly	and to
			· ·	Sub ana	mixed	w/ 5.	les pourles &	coal
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Sample	e/Core	Log						,
Boring/Well	<u> CB-8</u>	22	Project/No.	0408	0012.0000	5		Page of
Site Location		ip Ca	nal lo	mmans	Drilling Started		Drilling Completed	8-4-16
Total Depth	Drilled	4	Feet	Hole Diameter			Type of Sample/ Coring Device	MACTO Cole
Length and of Coring De	Diameter evice	4'	+ 2"				Sampling I	Interval <u>4</u> feet
Land-Surfac	e Elev.		feet	Surveyed	Estimated		Datum	
Drilling Fluid	Used	NA					_Drilling Method	Geoprobe
Drilling Contractor	Noth	nagle			D	riller	Jeff S	Helper
Prepared By	Ryan	Clare					Hammer WeightNA	Hammer NA ins.
Sample/Core (feet below lai	Depth nd surface)	Core						
From	То	(inches)	Uses	Sample/Core De	scription			
0_	4	40	SM	(0-15"	It. brown	VP	Soud & Sill	, trace grandes
				to sm p	ebbles, and	<u>ь</u> s	ub randal.	dry loose.
			KM	1.5"-22"	SAA: Sila	+ + 1	of Sand, brit	the
			-	(22"-34")	white/gray	514	s/ash mix	brord grande
			-	to to peb	ble groin sta	123	fin Sand	to is pebly
				arah si	zer din, loo	58.		
	1		GM	84"- 40") Gray + bl.	ach	fine Sand,	Some mod to
				la poblo	r. Jub Fame	d to	rand Slag	I carl pounder
				dry lo	×Je.			
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* No fabric observed.

Sampl	ARCA							·		
Boring/Wel	<u>CB-2</u>	. 20g 1 <u>3</u>	Project/No.	04080012	N 00	00			Page	<u></u>
Site Location	shi	p Co	inal 1	lomnon s	Drilling Started	8-4-	-16	Drilling Completed	8-	4-16
Total Depth	Drilled	4	Feet	Hole Diameter 2	inches		Type of Coring D	Sample/ levice	Ma	cro Co
of Coring D	evice	41	- 2				-	Sampling Int	erval	<u> </u>
Land-Surfa	ce Elev.		feet	Surveyed	Estimate	d	Datum	4-th a d	NGA	(-en av
Drilling Flue	d Used	<u>NA</u>					_ Drilling N			Ceción
Contractor	Noth	inagle				Driller	Ser	4 <u>S</u> ,	Helper	
Prepared By	Ryan	Clare				<u> </u>	Hammei Weight	NA	Hamme Drop	NA in
Sample/Core (feet below la From	Depth Ind surface)	Core Recovery (inches)	0262	Sample/Core Descriptior	ì					
0	4	37	SM	(0-11") 14.	brown	uf S-	rd t	sit +	ace	grande
				any he sul a	ng, di	7, 100	Je.			9
			~	(11"-37") -222	7	Z D4	(edd	52 brow	n to	blach
				cool/slas	paulor	(vf-	f Jon	1 stead)	; 50	me
				chunker of	Cast	FILER	the	shaft	Do.1	brich
		-		et 32-40			/ -170			
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				* Fill Sta	11-1 -1	F 11	59	5		
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K No fabric observed

R	ARCA	DIS									
Sampl			Drois +/h1-	04080010	000	20			Page	(,	_{of} t
Boring/Wei Site		27	Project/No.		Drilling	9.14	11	Drilling		<u> </u>	" <u>— </u>
Location	Ship) Can	.cl (ou	nmons	Started	8-9-	Tupo of S	_Completed		1 -	16
Total Depth	Drilled	4	Feet	Hole Diameter 2	inches		Coring De	vice	Ma	CNS	Core
Length and of Coring D	Diameter evice	4'	+ 2		-		_	Sampling Inte	erval	4	feet
Land-Surfa	ce Elev.	/	feet	Surveyed	Estimate	d	Datum				
Drilling Flui	d Used	NA					Drilling M	ethod	80	Ged	probe
Drilling Contractor	Noth	nagle				Driller	Jer	<u>cf S,</u>	Helpe		
Prepared By	Ryan	Clare					Hammer Weight	NA	Hamn Drop	NA	ins.
Sample/Core (feet below la	e Depth and surface)	Core									
From	То	(inches)	USes	Sample/Core Description	<u> </u>						
0	4	38	5M	(0-6") 17.	brown	vf Se	mol &	silt, to	r Ce	gim	105_
		<u> </u>		to mal. Robb	les, an	5 6 5	us ang	, dry,	base		
			SM	(6"-10") SAA	<u>; 14.</u>	reddis	4 600	<u></u>			
			SM	(10"-15") SAA	1) ou	re grav	1				
			ML	(15 - 50°) 15m	own !	511+ +	<u> </u>	and, lit	1 1.	gran. No	100
				to 19 pobles	ang All	<u>⊀8</u>	w ny	, marst		17	2021
				A (21"-28")	PL.J		IJE MAI	CATION clas	<u></u>	l <u>o 57</u> lo(-	- 30 Diacas
·					U RCK	- 51 - 7	01.	<u>, , , , , , , , , , , , , , , , , , , </u>	1 31	<u>r 4</u>	prices)
		<u> </u>		pry rage.							
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ARCADIS Sample/Core Log

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Boring/Well	CB-2	15	Project/N	10. 04080012	1.0000				Page	of
Site Location	Ship	Car	nal	(ommon s	Drilling Started			Drilling Completed	8	4/16
Total Depth	Drilled	4	Feet	Hole Diameter 🥏	inches		Type of Sa Coring De	ample/ vice	Mad	to Lan
Length and I of Coring De	Diameter vice	4'+	- d					Sampling Int	erval	<u>Ч</u> _{feet}
Land-Surfac	e Elev.		feet	Surveyed	Estimated		Datum			
Drilling Fluid	Used	NA					Drilling Me	thod		Geoprob
Drilling Contractor	Noth	nagle				Driller	Jeff	S	Helper	
Prepared By	Ryan (Clare				_	Hammer Weight	NA	Hamme Drop	NA ins.
Sample/Core I (feet below lan	Depth id surface)	Core								
From	То	(inches)	USCS	Sample/Core Descrip	otion					
0	4	32	SM	(0-21")11.	brown	vf	sand .	+ 5517	tra	a to
				little aro	inves to	12	pebbles,	GAT	tes Se	is canda
				din loois	DEMA	RCATI	ON GRI	o at a	. 1" bg	5
			1	(61"-31")	nh redo	1155	a many	fine	sand	mixed
			3 44	w/slead	Concretes	de	bris, d	in los	SC	
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Field soil sample sheet.xlsx.xls Geoprobe Log

location on ore mound mid-slope

Sample/Core Log Boring/Well CB-26 Project/No. CMO 80012.0000 Page L of 1 Status Ship Canel Commons Status Composition Mac to Core Status Composition Status Type of Samples Mac to Core Composition Status Composition Mac to Core Composition Status Sample/Core Mac to Core Composition Sample/Core Sample/Core Mac to Core Composition Mac to Core Sample/Core Sample/Core Composition Nothnagle Datum Sample/Core Sample/Core Prepared Mac to Core Sample/Core Sample/Core Sample/Core Prepared Mac to Core Sample/Core Sample/Core Hearmer Mac no. Commoor Nothnagle Dore NA Dore NA Ins. Prepared Mac to Core Sample/Core Sample/Core Hearmer Mac no. Na Ins. Commoor Nothnagle Dore NA Sample/Core Sample/Core Hearmer </th <th>Ø</th> <th>ARCA</th> <th>DIS</th> <th></th> <th></th> <th></th>	Ø	ARCA	DIS			
BoringWeil <u>CB-26</u> Projective. <u>04080012.0000</u> Site <u>Caren</u> <u>Ship Caren</u> <u>Commons</u> <u>Brilling</u> <u>Delling</u> <u>B-4-16</u> <u>Construction</u> <u>Corenel</u> <u>Commons</u> <u>Brilling</u> <u>Delling</u> <u>B-4-16</u> <u>Type of Sumpleior</u> <u>B-44-16</u> <u>Composition</u> <u>Corenel</u> <u>Composition</u> <u>Macro Care</u> <u>Construction</u> <u>Corenel</u> <u>Corenel</u> <u>Corenel</u> <u>Macro Care</u> <u>Construction</u> <u>Corenel</u> <u>Corenel</u> <u>Corenel</u> <u>Macro Care</u> <u>Construction</u> <u>Corenel</u> <u>Corenel</u> <u>Corenel</u> <u>Macro Care</u> <u>Construction</u> <u>Corenel</u> <u>Corenel</u> <u>Macro Care</u> <u>Construction</u> <u>Corenel</u> <u>Corenel</u> <u>Corenel</u> <u>Macro Care</u> <u>Corenel</u> <u>Corenel</u> <u>Corenel</u> <u>Corenel</u> <u>Macro Care</u> <u>Corenel</u> <u>Corenel</u> <u>Corenel</u> <u>Corenel</u> <u>Corenel</u> <u>Macro Care</u> <u>Corenel</u> <u>Corenel</u> <u>Corenel</u> <u>Corenel</u> <u>Corenel</u> <u>Macro Care</u> <u>Macro Care</u> <u>Corenel</u> <u>Corenel</u> <u>Corenel</u> <u>Corenel</u> <u>Corenel</u> <u>Macro Care</u> <u>Macro Care</u> <u>Macro Care</u> <u>Macro Care</u> <u>Macro Corenel</u> <u>Corenel</u> <u>Macro Care</u> <u>Ma</u>	Sample	e/Core	Log			
Site Ship Canada Commons Drilling Drilling $3 - 4 - 1b$ Total Death Drilled 4 Feet Hole Diameter 7 Inches Type of Sample's Mac no Care Langh and Diameter 4 Feet Hole Diameter 7 Inches Type of Sample's Mac no Care Corring Device 0 4 4 A Sampling Interval 4 feet Land-Surface Elw.	Boring/Well	CB-	-26	Project/No.	04080012,0000	Page of
Total Doption Drilled 4 Feet Hole Diameter 7 Inches Type of Sample/ Comp Divice If ac no Care Land-Surface Elev. freet Surveyed Estimated Datum Sampling Interval 4 Dilling Tubbled NA NA Dilling Tubbled NA Dilling Tubbled Sample/ Semple/Comp Main Mac no Care Dilling Tubbled NA NA Dilling Tubbled NA Sample/Comp Dilling Contractor Nothnagle Uniter Feet Hommer Hommer Hommer Prepared Ryan Clare Nothnagle Uniter Sample/Comp Mains Hommer Hommer Hommer Sample/Core Deptice To the Surveyed Sample/Core Deptice Hommer Hommer <td>Site Location</td> <td>shi</td> <td>p Ca</td> <td>nal G</td> <td>ommons Drilling</td> <td>Drilling Completed 8-4-15</td>	Site Location	shi	p Ca	nal G	ommons Drilling	Drilling Completed 8-4-15
Length and Dameter U + 2 " Sample Green Datum Single Interval U foot Control Device Interval U + 2 " Sample Green Datum Control Datum Control Devices Nothing le Datum Control Devices Nothing le Datum Control Devices Nothing le Datum Version Nothing I interval U for the Control Devices Nothing I interval U for the Control Devices Of the Levice Of the	Total Depth	Drilled	4	Feet	Hole Diameter inches	Type of Sample/ Coring Device
Land-Surface ElevfoetSurveyedEstimatedDatumDatumDatumDatumDatumDatumDatumDatumDatumDatum	Length and i of Coring De	Diameter evice	4'	2 2		Sampling Interval
Drilling Fluid Used NA Drilling Method Cooperator Nothing Provide and Provide	Land-Surfac	e Elev.	~	feet	Surveyed Estimated	Datum
Drilling Nothnagle Driller Self S. Helper Prepared Ryan Clare Hammer NA Hammer NA ine. Sample Core Records USCS Sample Core Records USCS Sample Core Records OF (11) 14. brown vf Sand + Silt, 1111 growner (11) 14. brown vf Sand + Silt, 1111 growner (11) 14. brown vf Sand + Silt, 1111 growner (11) 14. brown vf Sand + Silt, 1111 growner (11) 14. brown vf Sand + Silt, 1111 growner (11) 14. brown vf Sand + Silt, 1111 growner (11) 14. brown vf Sand + Silt, 1111 growner (11) 14. brown vf Sand + Silt, 1111 growner (11) 14. brown vf Sand + Silt, 1111 growner (11) 14. brown vf Sand + Silt, 1111 growner (11) 14. brown vf Sand + Silt, 1111 growner (11) 14. brown vf Sand + Silt, 1111 growner (11) 14. growner (11) 14. brown vf Sand + Silt, 1111 growner (11) 14. growner (11	Drilling Fluid	Used	NA			Drilling Method
Prepared By Ryan Clare Hammer Weight NA Hammer Drop NA Image: Core Book (notes) Core Records Sample: Core Book (notes) Sample: Core Book (note	Drilling Contractor	Noth	nagle		Driller	Jeff S. Helper
Sample/Core Desting Text Extra statutions Core Prim To Recovery Prim To Recovery	Prepared By	Ryan	Clare			Hammer Hammer NA Drop NA ins.
From to (notes) USCS SampleCon Description O Y SI SM $(O - 11")$ If, brown vf Sand + Silt, little granules d_{1} lg (26262, SUB angular to randed, dry, loose, rootts ML $(11"-15")$ Gravish brown Silt + vf Sand; little granulus to md. pebbles, and to sub raunded, dry, Cose, brittle, DEMARCATION CRID at 15" bgs. $-(55"-31")$ Wixed 1ayars of fill (Bod brick, Slag, ash, traal, dry, loose. $-(5"-31")$ $Cose, brittle (1ayars) of fill (Cose, Slag, Sla$	Sample/Core (feet below lar	Depth nd surface)	Core Recovery	11.00		
U 7 SI SFJ (0-11) It. brown vt Sand t Silt, little granules the 1g pebbles, Sub angular to randed, dry, loose, roots M2 (11"-15") Grayish brown Silt + VF Sand; little grandus to und. pebbles, ang to us rounded, dry, loose, brittle, DEMARCATION GRID at 15" bgs. - (15"-31") Mixed layers of fill (Bod birde, Jleg, ash, trool, dry, loose. 	From	To	(inches)	2220	Sample/Core Description	5 1
it 19 pebbles, sub angular to (andal, dry, roose, rootts) M2 (11"-15") Grayish brown Silt + VF Sand; little granulas to mid. pebbles, ang to sub randal, dry, loose, briftle, DEMARCATION GRID at 15" bgr.	0	<u> </u>	51	571	(0-11) It. brown vt	Sand + Silt, little granules
Image: Start of the start	<u> </u>		<u> </u>		the 19 pobles, Sub angula	to canded, dry, 1005c,
Image: State of the state o				11	roots	SILLANG Sand - Wille
grantus to ynth proofs, and to store, and the sto				<u> </u>	(11-15) weys a state	sift of some , its
Coole Strike Coole Strike Strik Strik Strik		+			Grandes is more products	The cran of 15" has
$ \begin{array}{c} $					(15"-31") Wixed Langers	of fill (Red bish, I/29.
				<u> </u>	ash trool dry loose	
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location on ore mound mid slope

Ø	ARCA	DIS		
Sample	e/Core	Log		
Boring/Well	CB-	27	Project/No.	04080012.0000 Page of
Site Location	Shi	p Ca	nd co	ommens Drilling Started Drilling Completed
Total Depth	Drilled	4	Feet	Hole Diameter 2 inches Type of Sample/ Coring Device Macro Core
Length and I of Coring De	Diameter evice	<u> </u>	+ 2 _	Sampling Interval 4
Land-Surfac	e Elev.		feet	Surveyed Estimated Datum
Drilling Fluid	Used	NA		Drilling Method
Drilling Contractor	Noth	nagle		Driller Jeff S Helper
Prepared By	Ryan (Clare		Hammer Hammer NA ins.
Sample/Core (feet below lar	Depth 1d surface)	Core		
From	То	(inches)	N252	Sample/Core Description
0	4	42	SM	(0-5") H. brown Ovf Sand + Silt, frech
				grandes to und, pebbles, sub ang to sub randel.
				dis lase.
			ML	(5"-12") Dhe brown silt + uf Send, little to
				some small pepples and to sub mg, dry
				very stiff.
			ML	(12"-25") Grand SAA: Brown, little granules
				by 1. pepper DEMARCATION CRID at 25" bas
				(St"-42") NG addith Looping to Yeek fine
				send valued where the lasse Rive
				Share the share
				Jins 16 mm Store
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Boring/Well	<u>CB-</u> ,	28	Project/No.	04080012.0000 Page 1 of 1
Site Location	Shi	pca	nal co	Drilling Drilling Drilling Started Drilling Completed 8-5-16
Total Depth	Drilled	4	Feet	Hole Diameter inches Type of Sample/ Coring Device // Coring Device
Length and of Coring D	Diameter evice	4	+ 2"	Sampling Intervalfeet
Land-Surfa	æ Elev.	_	feet	Surveyed Estimated Datum
Drilling Flui	d Used	NA		Drilling Method
Drilling Contractor	Noth	nagle		Driller Jeff S. Helper
Prepared By	Ryan	Clare		Hammer Hammer NA Ins.
Sample/Core (feet below la	Depth nd surface) To	Core Recovery (inches)	0505	Sample/Core Description
ß	4	40	SM	(0-16") H. brown VF Sout + Silt arching
				to silt & vf sand dreve granules to md.
				pobles, seb ang to sub landed, dry, loose
				grading to very SHIFF. DEMARCOTION GRID
				<+ 16" bgs,
				(16"-19") Co black crushed slag
			CL	(19"-22") De dine brown Clay, trace silt, morst
		1		Hard
			6	(22"-37") Dhe reldish brown + black crushed
				slag and root, trace wood debils, dry lase
			CL	(37"- 40") olive bown clay, little silt.
				moist very stiff to hard
		1		
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Ø	ARCA	DIS							
Sample	e/Core	Log							
Boring/Well	CB-:	29	Project/No.	04080012	.0000			Page	of
Site Location	Shi	p Cav	nal cor	nmons	Drilling Started	/	Drilling Completed	8-2-	16
Total Depth	Drilled	4	Feet	Hole Diameter	inches	Type of Coring	Sample/ Device	Macro	Lore
Length and I of Coring De	Diameter wice	4 +	7				Sampling Inte	rval <u>4</u>	feet
Land-Surfac	e Elev.		feet	Surveyed	Estimated	Datum			
Drilling Fluid	Used	NA				Drilling	Method	Ge Ge	probe
Drilling Contractor	Noth	nagle			D	riller <u>5e</u>	.++ S=	Helper	
Prepared By	Ryan	Clare				Hamm Weight	er NA	Hammer Drop N	A ins.
Sample/Core (feet below lar	Depth nd surface)	Core Recovery	0505						
From	To	(inches)	< <u>K</u>	Sample/Core Descriptio		1 h m 2	silt 4	rsu te	1241
	<u> </u>	91	211		A Coll	S and a	cure by s	the Grande	
				gronves ru	WA Loper	ri, 305 ·			<u>~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ </u>
	<u> </u>		5 1	Conse, Toors,	1: 0-	*		la pable	
			571	9-15-1 54	y ung	Jone		5 10054	· · · ·
 	<u> </u>			tractional re		11 . 0	<u> </u>		
	<u> </u>	<u> </u>	ML	(15'-ZI") B	rown si	1+ & V#	Send, 7	rau g	(ande)
			· ·	to md. pel	bles, ang	to sub	(ounded,	dry to i	maist,
				very stiff.	DEMARO	CATION	orin st	21" ba	<u>s.</u>
			ML	(21-27-) 5	AA; som	~e d4 1	od mottl	Ing, 17	44e
				grandes te	md. po	6565,			
				27"-37") 0	leck + wh	he stre	5 + ~sh	d(7,	louse.
			CL	(3)"-41") ol	ine brow	n class	117+14	s:14, m	file
				very stiff,	R1 (04	1 + 510	y in s	hae	
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	+								
							·		
<u> </u>				·					
				<u> </u>					
		<u> </u>							

6	ARCA	DIS		
Sample	e/Core	Log		
Boring/Well	CB-1	30	Project/No.	04080012 0000 Page 1 of 1
Site Location	Shi	p Cai	nal	(ommons Drilling Started Drilling Completed 8-5-16
Total Depth	Drilled	<u>ų</u>	Feet	Hole Diameter 2 inches Type of Sample/ Coring Device Macro Core
Length and I of Coring De	Diameter wice	4'2	5.1	Sampling Interval 4_feet
Land-Surfac	e Elev.		feet	Surveyed Estimated Datum
Drilling Fluid	Used	NA		Drilling Method
Drilling Contractor	Noth	nagle		Driller Seff S. Helper
Prepared By	Ryan	Clare		Hammer Hammer NA Drop NA ins.
Sample/Core	Depth	_		
(feet below lar	nd surface)	Core Recovery (inches)	USC 5	Sample/Core Description
O	4	36	SM	(0-7") It. brown uf Sand + Silt trees granuly
				to sur pepples and to sub and dry 10030.
			321	(7"-14") SAA It. Mehwish hown, DEMARCATION
				C-RID at 14" bas
			-	(14". 34") Rlock + and Dir red Hab boxing crushed
				clas a coul little white ash trace clay
				dia longe
		†		
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ARCADIS Sample/Core Log

Cumpi	0010	LOg							
Boring/Well	CB-J	57	Project/No	040800	12 0000				Pageof
Site Location	shi	n (av	nal (ommons	Drilling Started			Drilling Completed	8/5/16
Total Depth	Drilled	4	Feet	Hole Diameter	2inches		Type of Sa Coring De	imple/ /ice	Macio Core
Length and I of Coring De	Diameter wice	4'	8 2 W					Sampling Int	terval 4 feet
Land-Surfac	e Elev.		feet	Surveyed	Estimated		Datum		
Drilling Fluid	Used	NA					Drilling Me	thod	221 Geoprobe
Drilling Contractor	Noth	nagle				Driller	Seff	5.	Helper
Prepared By	Ryan	Clare			- <u></u>	_	Hammer Weight	NA	Hammer NA ins.
Sample/Core I (feet below lar	Depth id surface)	Core							
From	То	Recovery (inches)	USes	Sample/Core Des	cription				
٥	Ч	45	SM	(0 - 8 ") 1;	1. brown	vf	sand .	· Silt,	Frece granuly
			1	to 19 Po!	bbes, ang	to y	sub and	, dry	1, 100 Se
			SM	(x"-11")5	An ; Granis	25	(Clarkon)		
<u> </u>			ML	(n ⁻ 2 k ⁿ)	Reause St	It t	uf Se	-d: +	mer to little
			11-	11-2-1	1 10 00		6.00	the cash	Edwarded Stor
				granulas	<u> </u>	1.1	// 0	64000	
				dry, ver	y stiff,	5(11)	4. 13	CHINE	VATION GACIU
				<u>-+ 26"</u>	695.			1.3. 4	
			<u> </u>	26-45) Black	to V	h led	155 5 m	in crushed
ļ	ļ		ļ	Slag &	Coal, litz	the c	crished	cand	rete, dry,
		ļ		10050					
			ļ						
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Ø	ARCA	DIS		
Sample	e/Core	Log		
Boring/Well	<u>CB-3</u>	2	Project/No.	04080012.0000 Page 1 of
Site Location	Ship	Cav	19/ 60	mmans Drilling Drilling Drilling X-5-16
Total Depth	Drilled	4	Feet	Hole Diameter 2 inches Type of Sample/ Coring Device ,Macro Core
Length and I of Coring De	Diameter evice	4+	9 ^u	Sampling Interval feet
Land-Surfac	e Elev.		feet	Surveyed Estimated Datum
Drilling Fluid	Used	NA		Drilling Method
Drilling Contractor	Noth	nagle		Driller Jeff S. Helper
Prepared By	Ryan (Clare		Hammer Hammer NA Ins.
Sample/Core I (feet below lan	Depth nd surface)	Core Recovery		
From	То	(inches)	2520	Sample/Core Description
0	9	33	SM	(0-8°) It brown uf Sand + silt trace granter
				to md. pobbles, sub ang to sub rand, dry lasse.
		L	3M	(8"-15") SAA; H. Grey
			ML	13"-14") Grown silf & uf Sand, little son to
				und pebbes and to sub and dig vom SHEF.
				DomarcATION GRID of 14" bar.
			-	(14"- 33") DK reddish Som crushed stag mixed
				w/ some coal & md. pessles, d(y, loose
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Sample	ARCA e/Core	DIS Log							
Boring/Well	CB-3	33	Project/No.	04080	0012 0000	<u> </u>			Page of
Site Location	Shi	p Cau	nal Co	sumans	Drilling Started			Drilling Completed	8-5-16
Total Depth	Drilled	4	Feet	Hole Diameter	2inches		Type of Sa Coring Dev	mple/ /ice	Macro Core
Length and of Coring De	Diameter evice	4 +	<u> </u>			_	_	Sampling Inte	erval <u>4</u> feet
Land-Surfac	e Elev.		feet	Surveyed	Estimated		Datum		MA Geerba
Drilling Fluid	Used	NA					Drilling Met	thod	ar Geoploge
Contractor	Noth	nagle			Ľ	Driller	Jett	2	Helper
Prepared By	Ryan	Clare					Hammer Weight	NA	Hammer NA ins.
Sample/Core (feet below lar	Depth nd surface)	Core							
From	То	(inches)	0262	Sample/Core De	scription	0		<u> </u>	
0	4	54	SM	0-4") 11	, brown vi	f Sa	nd + 5	ill, to	ea gronules
	<u> </u>		5.5	to 19 peb	ses and to	Sub	, Joind	d, dr	7, loste routs.
				(9 - 12)	Raw Sil	1 4			Alle constant
			FIL	to mad	Pehble: me	<u>7</u>	sub av	no di	a stift to
_				von st	IFF DEMO	HELA	TIGNI	GRID	·+ 17" b95.
			-	(17"-25") Dh redlis	4 5	rown i	wither	slag w/
				same co	al little	21-5	had 11	me show	e, dry 10050
			66	25 - 31	17. Gray C	crust	har 11	me sto	u.
			~	(31"- 34")	Chamber o	f P	Inch t	- blue ,	5)-9.
	<u> </u>	<u> </u>							
		<u> </u>							
			· ·						

Sample	ARCA Core/	DIS Loa					
Boring/Well	<u> </u>	<u>ч</u>	Project/No.	0000408001	2,0000)	Page of
Site Location	Shi	e Ca	nail Ca	mmdn 5 Drill Star	ing ted	Drilling Completed	8-5-16
Total Depth	Drilled	\$3	Feet	Hole Diameter 2 inch	es	Type of Sample/ Coring Device	Macro Core
of Coring De	vice	4	F 2		matad	Sampling Int	terval 9 4 feet
Drilling Fluid	Used	NA				Drilling Method	Stee probe
Drilling Contractor	Noth	nagle			Driller	Jeff S.	Helper
Prepared By	Ryan	Clare				Hammer Weight <u>NA</u>	Hammer NA ins.
Sample/Core I (feet below lan	Depth d surface)	Core Recovery	U3C 5	Sample/Coro Description			
0	3	33	SM	(0-8") 14. brow	- uf s-	+ 56 F.	trea grander
				to sim pobbles,	ans to s	ub my dry	, losse, l'dk.
				Stare of 8".		, ,	
	<u> </u>		SM	(8"-12") SAA; G	rayish bi	when, some	graver to ly
			(0)	pobles	())	f a l l	
			PIL	12-18 Brown	<u>3i/+ +</u>	VT Sand, tr	ice m-c fond,
				true them shift	h-11.	DEMARCA	ridu (mai)
				=+ 18" bas	, orrorac	17101111041	
				[18"-33"] Bleel	e f grav	y crushed a	idel + steg.
				dry, lasse	<u> </u>	1	
					4ci		
						<u> </u>	
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Field s	oil sample	sheet.xlsx					
Geopr	obe Log		* re	forsol at 3'	595		

Boring/Weil (2:-35) ProjectNo. 04080012.0000 Page 1 of 1 Boring/Weil (2:-35) ProjectNo. 04080012.0000 Page 1 of 1 Callocation Device Shing Cangl Commons Dilling Completed 2-5-16 Dilling Completed 2-5-16 Carlo Depth Divide 4 Feet Hole Diameter Dilling Completed 2-5-16 Dilling Completed 2-5-16 Carlo Depth Divide 4 Feet Hole Diameter Dilling Completed 2-5-16 Dilling Completed 2-5-16 Carlo Depth Divide 4 Feet Hole Diameter Dilling Completed 2-5-16 Dilling Completed 2-5-16 Divide Tarlo Device 4 Feet Barney Completed 2-5-16 Divide 2-5-16 Indire Hall Device 4 Feet Divide Tarlo Device Macros Carle Divide Tarlo Device 4 Feet Divide Tarlo Device Macros Carle Divide Tarlo Device Nothnagle Divide Tarlo Device Nothnagle Divide Tarlo Device Divide Tarlo Device Nothnagle Divide Tarlo Device Nothnagle Nothnagle Divide Tarlo Device Nothnagle Divide Tarlo Device Nothnagle Divide Tarlo Device	Sample/	RCADIS						
Sile_ Ship Canal Commons Dating	Boring/Well	B-35	Project/No.	040800	12 0000			Page of
Total Depth Drilled 4 Feet Hole Dlameter 1 index Type of Sample' MARC 10 Carle Langth and Dlameter 1 + 2 Sample for the composition Sample for the composition 4 + + Sample for the composition Marc 10 Carle Sample for the composition 4 feet Drilling Fluid Used NA NA Issue of the composition Issue of the composition </td <td>Site Location</td> <td>ship Ca</td> <td>ngl W</td> <td>mmons</td> <td>Drilling Started</td> <td></td> <td>Drilling Completed</td> <td>8-5-16</td>	Site Location	ship Ca	ngl W	mmons	Drilling Started		Drilling Completed	8-5-16
Langth and Diameter $4^{1} + 2^{1}$ Sampling Interval 4^{1} feet 2^{1} Sampling Interval 4^{1} Samplin	Total Depth Drille	ed <u>4</u>	Feet	Hole Diameter	→ inches		Type of Sample/ Coring Device	MACTO LONE
Land Surface Elev feet SurveyedEstimated Datum Drilling Fluid Used NA Contractor Nothnagle Drillier Jeeff S Helper Prepared Ryan Clare Nothnagle Uniter NA Memore NA SurveyedCore Depting Core Recovery USCS SurveyedCore Description Not NA Memore NA NA NA Memore NA NA Memore NA Memore NA	Length and Diam of Coring Device	neter 41	+ 2				Sampling Inte	erval <u> </u>
Drilling Field Used NA Drilling Method Att Geographic Drilling Field Used Nothnagle Drilling Method Teff S. Helper Prepared Ryan Clare Drilling Method Teff S. Helper Sample/Core Deptilic Order Order NA Drilling Method NA Sample/Core Deptilic Order Order NA Drilling Method NA Sample/Core Deptilic Order Order NA Drilling Method NA Difference Core Recomm VS C 5 Sample/Core Description Image: Difference Core Recomm VF Send ± Silt. tread granulars Image: Difference SM (G-97) SAA; Core Arg. Sore Image: Difference SM (G-97) SAA; Core Arg. Sore Image: Difference SM (G-97) SAA; Core Arg. Sore Image: Difference SM (G-97) Sore For Sore Image: Difference Difference Sore Sore Image: Difference Difference<	Land-Surface Ele	ev.	feet	Surveyed	Estimated		Datum	Mar a l
Drilling Nothnagle Driller Jeff S. Helper Prepared By Ryan Clare Hammer Weight NA Drop NA ne. Sample/Core Depth (metaboxind satistics) Core Form To Mammer NA Drop NA ne. Prom To Grapher USCS Sample/Core Description To and the solid transfer of the	Drilling Fluid Use	ed NA					Drilling Method	Ber Geoprobe
Prepared Ryan Clare Hammer NA Doop NA ins. By Ryan Clare Hammer NA Doop NA ins. Sample/Core Depth (Met Devine's USCS Sample/Core Description To To Core From To SM (0-6") [1. brown vf Send + Ss]t. trea granules + und. Ae6663 ang to sub ang, dry, lease, read - SM (5"-9") SAA; ang - ML A". 12") Granish brown Silt + vf Sand, trace granules - SM (2"-20) (cddish brown f-c Sand, little granules - Joose. DE MARMENT BRID -d Da" by: - Joose. DE MARME	Drilling [] Contractor	Nothnagle				Driller	Jeff S	Helper
SampleCore Depth (redet) USCS SampleCore Description From To Becovery USCS SampleCore Description USCS SampleCore Description US	Prepared R	lyan Clare					Hammer Weight NA	Hammer Drop <u>NA</u> ins.
From To (inches) USUS SampleCore Description O Y Y7 SM (0-5") [t. brown vf Sand + Ss]t. tread grants t und. pablobs and to sub and, dry, lower, real 7. SM (6"-9") SAA; cany ML A". 12") Granish brown Silt + vf Sand, tread grantes ta la pablobs, and to sub and, dry, vary silt ff. SW (2"-Co") (addish brown f-c Sand, little grantes to la pablob, and to sub and, dry, vary silt ff. (a la pablob, and to sub and, tread grantes (a la pablob, and to sub and, dry, vary silt ff. (a la pablob, and to sub and, dry, vary silt ff. (a la pablob, and to sub and, dry, vary silt ff. (a la pablob, and to sub and, dry, vary silt ff. (a la pablob, and to sub and, dry, vary silt ff. (a la pablob, and to sub and, dry, lower, silt, dry, (a la pablob, dry, lower, lower, la la la pablob, dry, lower, silt, dry, (a la la pablob, dry, lower, la	Sample/Core Dept (feet below land su	h rface) Core Recovery	11505					
C 4 11/ Still (0-0) (1. violand VT Jend & Solf, Tred grants) + m.l. pebliks, ang he sub ang, dry, lease, real 7, ML (6'-9') 59A; ang ML (6''-12') Gravish brown Silf + vf Sand, trade grandes 1 1 1 1 0 pebliks, ang he sub ang, dry, very Stiff. SW (2''-20') (eddish brown f-c Sand, liktle grandes) to 1 g pebliks, ang to sub ang, trade Silt, dry, 1 and 1 g pebliks, ang to sub ang, trade Silt, dry, 1 and 1 g pebliks, ang to sub ang, trade Silt, dry, 1 and 1 g pebliks, ang to grave by sub ang, trades 1 and 1 g pebliks, ang to grave by sub ang, trade Silt, dry, 1 and 1 g pebliks, ang to grave by sub ang, trades 1 and 1 g pebliks, ang to grave by sub ang, trades 1 and 1 g pebliks, ang to grave by sub ang, trades 1 and 1 g pebliks, ang to sub ang, trades 1 and 1 g pebliks, ang to sub ang, trades 1 and 1 g pebliks, ang to sub ang, trades 1 and 1 g pebliks, ang to sub ang, trades 1 and 1 g pebliks, ang to sub ang, trades 1 and 1 g pebliks, ang to sub ang trades 1 and 1 g pebliks, ang trades 1 and	From To	(inches)	c M	Sample/Core Desc	ription	<u>c</u> <.	and a sector	
SM (6"9") SAA; Cran ML A". 12") Grajish bran Sillt + VF Sard, trad grandes ta la posser, ang to sub ang dig, vary sittf. SM (2"-20") (eddish bran f-c Sand, little grandes to la posses, ang to sub ang trace sillt, dry, looge, DEMARATION GRID -t 20" bgs, (2a"-3s") [gl-ch + gray crushed sl-q + cael, trace sm - M posses, SR (2"-20") Dh reddirh braun sodtf cast (radact U Some Wood Graenics, dry, loose, U Some Wood Graenics, dry		9 97	>11		Lifes and	F J.	and & solt	Trea gronius
ML "". 12") Gravish brown Silt + VF Sand, trace grandes ta la posses, ang to sub ang, dig, very sittef. SW (2"-20") (eddish brown f-c sand, little grandes to la posses, and to sub ang, trace silt, dry, loose, DEMARONTIAN GRID - d 20" bys. (20"-33") [s] cch + gray crushed slag + ccael, trace smo-ma pobles, dry, loose. (37"-47") Dhe reddirk brown sodt/ ccal froduct U Some Wood organics, dig, loose.			SM	("-q") <4	A' Crow	10	sor my al	<u>, 1238</u> , <u>100</u>),
Image: the lag possible, and the sub and dig, very sitter Shi (2"-co") (eddish brown f-c Sand, little grantes Image: the lag possible, and the sub and three sitt, dry, Image: the lag possible, and the sub and three sitt, dry, Image: the lag possible, and the sub and three sitt, dry, Image: the lag possible, and the sub and three sitt, dry, Image: the lag possible, and the sub and three sitt, dry, Image: the lag possible, and the sub and three sitt, dry, Image: the lag possible, and the sub and three sitt, dry, Image: the lag possible, and the sub and three sitt, dry, Image: the lag possible, and the sub and three sitt, dry, Image: the lag possible, and the sub and the			ML	9"- 12") G	regist brow	~ 5	ilt + VF Sand	trad complet
SW (2"-co") reddish brom f-c Send little grantes to 19 pebbles, and to sets and, trace silt, dry, 1005c, DEMARANTIAN GRID at 20" by; - (20"-33") Ricch + gray crushed sile; + cool, + trace sin - md pobles, dry, losse. - (3?"-47") Dhe reddirh brown sodt/cool product WI some wood organics, dry, 100 se. 				ta la 003	565. me	6 5	us and dis	ven stiff.
Image: Start Start Image: Start Image: Start Image: Start <td< td=""><td></td><td></td><td>SW</td><td>(2"-20")</td><td>(eddish b</td><td>rom</td><td>f-c Sand 1</td><td>Atte grandes</td></td<>			SW	(2"-20")	(eddish b	rom	f-c Sand 1	Atte grandes
/ losse. DEMARAMAN GRID -2 20" by: - (20"-33") [3]-ch + gray crushed s]-g + cool, - Hrace sim - md pobles, dry, losse. - (37"-47") Dh reddirh brown sodt/cool fodect - 4/ some wood organics, dry, loose. 				to 19 pes	bles, ang	to so	15 ang, trece	silt, dry.
- (20"-33") Black + gray crushed slag + cool, - Hrace sim - md pobles, dry, loose. - (3?"-47") Dhe reddirh brown sodt/cool product 				loose, D	EMAPOTIO	n G	RID -7 20'	' bgr
Han sin - M politis dry, losse (S? - 47") Dh reddirh brown sodt/coal product W/ some wood organics, dry, losse			-	(20"-33")	Black to	ray	crushed slag	+ cool,
(3?-47") Dh reddirh brown sodt/coal product w/ Some word organics, dry, 1000000000000000000000000000000000000				frace sh	-md pob	145	dry, losse	
ω/ Sómic Woodd Gragenics, d(y, 166588)				67"- 47"	Dh redd	Ir V	brown south	carl product
				w Jom	ر ساعلام ر	srach	ics, dy, lo	5 XC ::
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Field soil sample sheet.xlsx.xls Geoprobe Log

Sample/Core Log BorngWeil C.B-36 ProjectNo. 04080013.0000 Page 1 of 1 Ste Ship Canel (ommans Sites	Ø	ARCA	DIS			<u>_</u>
BoringWall C.B36 ProjectINO. 04080012.0000 Page 1 of 1 States Ship Canal (ammens States Defining Completed 8-516 Iotal Depth Diffeet 4 Feet Hole Diameter 2 Inches Comp Defining Contract 4 Feet Lands Darteer 4 Feet Hole Diameter 2 Inches Comp Defining Interval 4 Feet Lands Surface Elev. Inches Comp Defining Interval 4 Feet Lands Surface Elev. Inches Comp Defining Interval 4 Feet Dating Method Benetier 9 Feet Surveyed Estimated Datum 5 Feet By Ryan Clare 5 Surveyed Datum 7 Ford 5 Surveyed 1 Feet By Ryan Clare 5 Surveyed 0 Feet Surveyed 1 Feet 1 Silfs, for a granues Prom To 0 Feet 1 Surveyed 0 Feet 1 Silfs, for a granues Feet 1 Surveyed 0 Feet 1 Silfs, for a granues Feet 1 Surveyed 0 Feet 1 Silfs, for a granues Feet 1 Surveyed 0 Feet 1 Silfs, for a granues Feet 1 Silfs, for a granues 1 Silfs, for a granues Feet 1 Silfs, for a granues 1 Silfs, for a granues Feet 1 Silfs, for a granues 1 Silfs, for a granues Feet 1 Silfs, for a granues 1 Silfs, for a granues Feet 1 Silfs, for a granues 1 Silfs, for a granues Feet 1 Silfs, for a for silfs, for a granues 1 Silfs, for a granues Feet 1 Silfs, for a for silfs, for a granues 1 Silfs, for a granues Feet 1 Silfs, for a for silfs, for a for silfs, for a granues 1 Silfs, for a for silfs	Sample	e/Core	Log			
Site control of the state	Boring/Well	CB-	36	Project/No.	04080012,0000 Pa	ageof
I obleb Delled 4 Feet Hole Diameter 2 inches Type of Samplel Control Device Marca Care Land-Surface Elev.	Site Location	<u>Ship</u>	Can	ial (or	Drilling Drilling Completed	8-5-16
Length and Diameter 4' + 2" Sampler Construction 4' feet Control Devices Elev	Total Depth	Drilled	4	Feet	Hole Diameter 2 inches Type of Sample/ Coring Device	lacro core
Land-Surface ElevfreetsurveyedEstimated	Length and of Coring De	Diameter evice	4'	+ 2"	Sampling Interval	4_feet
Drilling Fluid Used NA	Land-Surfac	e Elev.		feet	Surveyed Estimated Datum	
Drilling Nothnagle Drilling Sett S. Holper Prepared By Ryan Clare Hammer Weight NA Hammer MA Ins. Prepared By Ryan Clare SampleCore Description O Y 34 SM (O - S. ³) H. brown vf Sml t Silt, force grants O Y 34 SM (O - S. ³) H. brown vf Sml t Silt, force grants O Y 34 SM O - S. ³) H. brown vf Sml t Silt, force grants O Y SM Sond + Silt, littlemed. Smd, little grants to I J Pethaeoman GR.p. at 18 Syst I Pethaeoman GR.p. at 18 Syst I Pethaeoman GR.p. at 18 Sond slas t Sone I I Pethaeoman GR.p. at 18 Sone Sone I I Pethaeoman GR.p. at 18 Sone Sone Sone I I Pethaeoman GR.p. at 18 Sone Sone Sone I I I I I I I I I I I	Drilling Fluid	Used	NA		Drilling Method	A Geopole
Prepare Ryan Clare Hammer NA Hammer NA Ins. Sample/Core Deprive Core Recovery USC 5 Sample/Core Description O 4 34 SM O-53 14. breach vf 5 Sult + 51/t, force granuls Prom To Recovery USC 5 Sample/Core Description O 4 34 SM O-53 14. breach vf 5 Sult + 51/t, force granuls Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare Image: Signal Clare<	Drilling Contractor	Noth	nagle		Driller Jeff S. He	elper
Sample/Core Depth (rect blow) in surface: $Core Recovery USCS Sample/Core Description O Y 3Y SM (O-S^*) 11. brown vf Smd t silt, for a grandesb$ Md , Robbes, ang to sub ang, drg , losse. SM Sond t silt, littlemed. Smd, little grandes to IS $Pebbles, ang to sub ang, drg, losse.IS$ $Pebbles, ang to sub ang, drg, losse.D$ IS IS IS IS IS IS IS IS	Prepared By	Ryan	Clare		Hammer Ha Weight NA Dr	op NA ins.
From To Recovery USCS Sample/Core Description (Recovery USCS) Sample/Core Description (B) 44 344 SM (0-53) 14. brown vf Sort + Silt, force granuls) (B) 40, Robbes, one to sub and, display for the second of the second vf of t	Sample/Core (feet below lar	Depth nd surface)	Core			
0 4 34 SM (0-5") H. brown vf Sand + Silt, force granuly 6 Mod. Robbes, and to sub and, dry, losse. (S"-18") Grayish brown greating to brown vf.f SM Sand + Silt, littlemed. said, little granules to 13 Robbes, and to sub and, dry, losse. DEPTARATION GRID at 18" bgs - (18"-34") Die Reddish brown crushed slag + some coal, dry, loase. 	From	То	Recovery (inches)	USCS	Sample/Core Description	
b Md, Pobbles, ong to sub ang, dry loase. (5"-18") Greyish brown greding to boom v f.f SM Sond + Silt, little med. Soud, little gronus to Is Pebbles, ang to sub ang, dry, loase. DEMARCOMON GRID at 18" bgs - (18" 34") Die reddish brown crushed slag t some coal, dry, loase. 	Ü	4	34	SM	(0-5") H. brown vf Soul + silk for	a gronulos
(5"-18") Grayish brown greding to bown vf.f SM Sond + Silt, littly med. Sond, little grantes to Is Robbes, any to sub any, dry, losse. DEMARCOTION GRID at 18" bgs - (18"-34") Die Reddish brown crusted stag + some col, dry, losse. 					to und, Robbles and to sub and die 1	OR Ke
SM Sond + Silt, little med. Sond, little growing to Is Pebbles, and to sub and, little growing to DEMARCOTION GRID at 18" bys - (18" 3") Die reddish bran crushed stag + some coal, dry, loase. 					(5"-18") Grantes hours and a bank	4. Q. P
Ist pebbles, and be sub and, mine geometry is Ist pebbles, and be sub and, diret DEMARCHMON GRID at 18" bgs - (18" 37") Die feddlich beem caushed sites t some coel, dry, Idase.				KM	Sand + Silt littlemed sand little	Const. x to
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $				11	1 alle a la cha da la	
Image: Second					13 probles, and the sca and, any, as	<u>же</u>
- - (18 - 597) Die Teiddish breim Crushed steg + Some - - - -					DEFTARCATION GRID &F 18 095	
$cox[_{x} dry_{x}]/dxse$ $cox[_{x$					18-57 De leddish to own crished SI	es & some
Image: Section of the section of th	-				corl, dry, Isase	
Image: Section of the section of th	<u> </u>					
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Ø	ARCA	DIS		
Sampl	e/Core	e Log		
Boring/Well	<u>(B-</u>]	37	Project/No.	04080012.0000 Page of 1
Site Location	Shi	P Cau	nal Co	Started Drilling Drilling Drilling Started
Total Depth	Drilled	4	Feet	Hole Diameter 2 inches Type of Sample/ Coring Device Macro Core
Length and of Coring De	Diameter evice	91	+ 2"	Sampling Interval
Land-Surfac	æ Elev.		feet	Surveyed Estimated Datum
Drilling Fluid	l Used	NA		Drilling Method Geopabe
Drilling Contractor	Noth	nagle		Driller Jeff S. Helper
Prepared By	Ryan	Clare		Hammer Hammer NA ins.
Sample/Core (feet below lar	Depth nd surface)	Core		
From	То	Recovery (inches)	2505	Sample/Core Description
0	3.5	37	SM	(0-7") It. brown uf Sand + Silt, trea grandes to
	<u> </u>			son pebbles, and to sub and, dig, loose, rodts,
		<u> </u>	SM	()"- 12") SAA; Gray, 1" dia. calcupous limestone at
		<u> </u>		
			ML	VC-25) Brown Silt + Uf Sand, trea grandes
		<u> </u>		to mol. 10065 and to sub rounded, dry, wind,
\sim				DETATE DEFINENTION CRID AT 20 095
		<u> </u>	CI	26th - 34" alive acres the set (1) - moldelle a
				trace silt builtle day to -alt very stiff
			-	(39"-37") Reddish Gray Star sodt powder, too ce
				fractived pack,
	<u> </u>			
	<u> </u>		ļ	
			<u> </u>	
	<u> </u>			
	<u> </u>			+
Field	soil sample	sheet.xisx		

Geoprobe Log

Ø	ARCA	DIS		
Sample	e/Core	Log		
Boring/Well	CB-	38	Project/No.	04080012 0000 Page of 1
Site Location	shi/) Car	al Co	mmon 5 Drilling Drilling Completed 8-5-16
Total Depth	Drilled	4	Feet	Hole Diameter inches Type of Sample/ Coring Device Mecro CorC
Length and of Coring De	Diameter evice	u'r	2 ¹¹	Sampling Interval
Land-Surfac	e Elev.		feet	Surveyed Estimated Datum
Drilling Fluid	d Used	NA		Drilling Method See g robe
Drilling Contractor	Noth	nagle		Driller Seff S. Helper
Prepared By	Ryan	Clare		Hammer Hammer NA ins.
Sample/Core (feet below la	Depth nd surface)	Core		
From	То	Recovery (inches)	uses	Sample/Core Description
0	4	44	3M	(0-8) 1t. brown uf Sand + silt, track growing +
				Ly Robbles, ang to sub ang, dry, loose, roots.
			SW	(8"-18") Reddish brown vf-m Sand, some growles to
				Is pobbles and to sub and, the silt, dry, losse.
				DEMARCATION GRID of 18" 695.
				(18"-44") Reddist brown & DK reddish brown
				Erished slasp coal, trace red brick, & trace
			-	grandes to 19 pebbles, any to dry, 10050.
L				
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Sample	ARCA e/Core	DIS Log			
Boring/Well	CB-	39	Project/No.	04080012.0000 Page / of /	
Site Location	5hi	p Ca	end c	Commons Drilling Drilling Completed 8-5-16	
Total Depth	Drilled	4	Feet	Hole Diameter 2 inches Type of Sample/ Coring Device Meso Care	
Length and of Coring De	Diameter evice	4'2	- 2"	Sampling Interval	
Land-Surfac	e Elev.		feet	Surveyed Estimated Datum	
Drilling Fluid	Used	NA		Drilling Method	
Drilling Contractor	Noth	nagle		Driller JCAR S. Helper	
Prepared By	Ryan	Clare		Hammer Hammer Weight NA Drop NA ins.	
Sample/Core ((feet below lar	Depth nd surface)	Core Recovery	110-0		
From	To	(inches)	0362	Sample/Core Description	
0	9	46	SM	(0-10") It. brown ut sand & silf trace grandes to	
				md. febles on f to sub ang, dry, loose, rods	
			SPI	(10"-12") SAA; Gry	
			SW	(12"- 27") Keddish Grown VF-F Sand, liffle granular	
	<u> </u>			to 19 pobles, ang to sub ang, liftle silt, dry to	
				maist, dense. 1° d/a blue 5/ag piece at 21 bgs	
				DEMARCATION GRID IT # 21 695	
				(27-28") Red crushal s/ag/sout	
				(28 - 55") White/glay fine sand & grander sub any	
			1	dry, 1058e.	
				133 - 46) Keddisk brown crushed Blag/ Jost material,	
				diy, loose	
	<u> </u>				
	<u> </u>				
<u> </u>					
			<u> </u>		

Ø	ARCA	DIS		
Sample	e/Core	Log		
Boring/Well	<'B-	40	Project/No.	04080012.0000 Page 1 of 1
Site Location	5hi	p Can	nal Co	mmons Drilling Drilling Drilling Started Completed 8-5-16
Total Depth	Drilled	4	Feet	Hole Diameter 2 inches Type of Sample/ Coring Device Marp Cove
Length and I of Coring De	Diameter vice	4'	+ Ju	Sampling Interval
Land-Surface	e Elev.		feet	Surveyed Estimated Datum
Drilling Fluid	Used	NA		Drilling Method Geoprobe
Drilling Contractor	Noth	nagle		Driller Seff S. Helper
Prepared By	Ryan	Clare		Hammer Hammer NA ins.
Sample/Core [(feet below lan	Depth d surface)	Core		
From	То	(inches)	1250	Sample/Core Description
0	9	42	SM	(0-7") It. brown of sand + clay, trace to
				little grendles to med pobbles and to seb one
				dia, lansa
			SM	7"-15" have acathe & could be a 12the
				1 13 same grand grand to grand thouse s (1884
				granes to by losslos, and to sub and, My, loose
				DEMARCATION GRID ++ 15" 595.
			SM (15"-24") Brown up sound + silt, little to
				Some groudes to 19 106365, and to sub ang,
				Fractural rocks throughout dry lasse.
			ML	24"- 39") Redding Grey Silt trea to liftle
				uf sand there stands to be la pollar and to
				sub a 11 tons at paget that were appealite
				(9"-92") fracturel store (11mestore)
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10.00

Ø	ARCA	DIS		
Sample	e/Core	e Log		
Boring/Well	CB-C	41	Project/No.	04080012,0000 Page of
Site Location	shi	r Cau	nol lo	mman Drilling Drilling Completed7-5-16
Total Depth	Drilled	4	Feet	Hole Diameter 2 inches Type of Sample/ Coring Device Maro Conce
Length and I of Coring De	Diameter wice	41	<u>-</u> 7	Sampling Interval
Land-Surfac	e Elev.		feet	Surveyed Estimated Datum
Drilling Fluid	Used	NA		Drilling Method Geoprobe
Drilling Contractor	Noth	nagle		Driller Jeff S. Helper
Prepared By	Ryan	Clare		Hammer Hammer Weight NA Drop NA ins.
Sample/Core I (feet below lan	Depth Id surface)	Core		
From	То	Recovery (inches)	Uses	Sample/Core Description
0	4	36	SM	(0-6") It. brann uf Sand + SAH trace grandes
				to und. pobbles, ang to sub ang, dry. lasse, locity
			ML	(6"-21") Brown Silt & vF Said, little grandes
				to 19. 106560s, any to sub rounded, dry to moist
				brittle, md. dense to danse.
				DEMARCATION CARID of 21" bar
·			~	Q1"-36") Rugt colored 5/as churles +
				powder (ifon one neyber)

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ARCADIS Sample/Core Log

Boring/Well	<u>Ge</u> c B	-42	Project/No.	0407	0012-000	0		Page	of	i -
Site Location	ship	Cano	1 Con	mons	Drilling Started		Drilling Completed	8-5	- 16	
Total Depth	Drilled	9	Feet	Hole Diameter	2inches	Type of S Coring De	ample/ vice	Mean	o con	
Length and of Coring De	Diameter evice	4	+ +	ι			Sampling Int	erval	fee	t
Land-Surfac	æ Elev.	_	feet	Surveyed	Estimated	Datum				
Drilling Fluid	Used	NA				Drilling Me	ethod	MA C	eopol	be
Drilling Contractor	Noth	nagle			U	riller Jeff	S.	Helper	_	
Prepared By	Ryan	Clare				Hammer Weight	NA	Hammer Drop	NA ins.	
Sample/Core I (feet below lar	Depth nd surface)	Core Recovery	OSCI							
From		(inches)		Sample/Core De	scription		- ())			-
	7	70	SM	(0-1)1	t. Brown UF	Jand +	<u>silt, 1</u>	ma g	(an Je 3	_
		<u> </u>		to ma	106663, ang	when, dry	1 / 503	c		_
	<u> </u>	<u> </u>	M	(>"-11")	SAA; Gree	7				
	<u> </u>	L	SM	(11"= 19")	Grayish br	own uf	Sad,	some	<u>sílt</u>	_
				1:4k	scarlos to	19 pessby	cons	to s.	ub rou	del,
				dry is	TOJE. DEMA	REATION	CRID	st 10	3" 691	-] _
				19 - 36") Dhe red	brown to	brown	122 4		-
				5/59/0	del meterio	1 , crushe	JAN	du dara	1 de	4
				10050						4
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Sample	ARCA e/Core	DIS Log		
Boring/Well	CB	43	Project/No.	04080012.0000 Page of
Site Location	ship	Can	al com	mon 3 Drilling Drilling Drilling 8-5-16
Total Depth	Drilled	4	Feet	Hole Diameter 2 inches Type of Sample/ Macro Cere
Length and of Coring De	Diameter evice	4	+ 2"	Sampling Interval 4 feet
Land-Surfac	e Elev.		feet	Surveyed Estimated Datum
Drilling Fluid	Used	NA		Drilling Method
Drilling Contractor	Noth	nagle		Driller Jeff Schuater Helper
Prepared By	Ryan	Clare		Hammer Hammer NA Ins.
Sample/Core I (feet below lar	Depth id surface)	Core	1	
From	То	(inches)	USCT	Sample/Core Description
0	9	39	SM	(0-7") (to brown uf Sand & silt frace
				granles to und pebbles, angular dry, losse, routs
			SM	(5"-10") SAA; Gray 1.5" die, stare of 9"-10"
			sM	(10"-12") \$247 Brown
			ML	12"-20") Dhe allow area silt: some very filme
		ĺ		Sad true to lifte slamber to le assiles and
				to subcande Maist ind dans to danse
				DEMARCATION GRID at 20" hor
				Dan-39" Rome of how Shalesol
				+ and a los of the start of the
				all all a all a all a light the find the some
				& other sin to 13 pessos, dry, 100 st
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ARCADIS Sample/Core Log

Boring/Well <u>-3-44</u> Project/No. 04080012.0000 Page of
Site Location <u>Ship Canal Comman</u> , Drilling Started <u>Drilling</u> Completed <u>8-5-16</u>
Total Depth Drilled 4 Feet Hole Diameter 2 inches Type of Sample/ Coring Device Marco Cove
Length and Diameter of Coring Device <u>477</u> feet
Land-Surface ElevfeetSurveyedEstimated Datum
Drilling Fluid Used NA Drilling Method
Contractor Nothnagle Driller Jeff S. Helper
Prepared By Ryan Clare Hammer NA Ins.
Sample/Core Depth (feet below land surface) Core
From To (inches) CSC S Sample/Core Description
0 4 40 SM (0-2) It. brown Vf Sand + SULT, trace grandes
to 13 pebbles, ang, dry, loose then routs.
SM (7"-10") SAA; almy
(10"-19") SAA; With scender to Is paller and a
ML (14"-26") very dhe bown silt, little uf sad
trea granles to small pebilos, the Sub ang to
Sub randed frace clay, motst, hard
DEMARTATION GRID at the 26" 695
- (26"- 31") Grayish Some Like Sand mixed
~/ chunks of roal 1/2" do 1" dia, diy, lawse.
- (31"- 40") Mixed grander white powdery
material. dry, loose,

APPENDIX C

Soil Boring Photographs



APPENDIX D

Soil Boring Location Photographs

