CROSS SECTION B-B'

REGINA PROJECT AREA

Period	Epoch	Stage / Age (Ma)	Group	Formation	Unit or Member	Lithology	Symbol
QUATERNARY	Holocene (0.01)		Saskatoon	Surficial Stratified Deposits	Alluvium	Silt, Sand, Gravel / Clay, Silt, Sand	Qa³ / Qa⁴ (Qssd)
					Alluvium	Silt, Sand, Gravel / Clay, Silt, Sand	Qa¹ / Qa²
					Haultain	Silt, Sand, Gravel / Clay, Silt, Sand	Qh³ / Qh⁴
					Haultain	Silt, Sand, Gravel / Clay, Silt, Sand	Qh¹ / Qh²
	PLEISTOCENE	Late Pleistocene – Late Wisconsin (0.023 to 0.034)		Battleford		Till	Qb-ut (Qb, Qsk)
						Gravel, Sand, Silt, Clay	Qb-s
						Till	Qb-lt
		Early Wisconsin (0.1)		Floral	Upper	Till	Qf-ut (Qf)
		Sangamon (0.2)			Riddell (Middle)	Gravel, Sand	Qf-ms
		Illinoian (0.6)			Lower	Till	Qf-lt
						Gravel, Sand, Silt, Clay	Qf-ls
						Till	Qf-bt
		Middle Pleistocene – Pre-Illinoian	Sutherland	Warman (0.64)		Till	Qw-t (Qw, Qsu)
						Gravel, Sand, Silt, Clay	Qw-s
				Dundurn	Upper (0.70)	Till	Qd-ut (Qd)
						Gravel, Sand, Silt, Clay	Qd-us
					Lower (0.78)	Till	Qd-lt
						Gravel, Sand, Silt, Clay	Qd-ls
						Till	Qd-bt
		Early Pleistocene (1.8)		Mennon	Upper	Till	Qm-ut (Qm)
						Gravel, Sand, Silt, Clay	Qm-s
					Lower	Till	Qm-lt
			Empress		Upper	Gravel, Sand, Silt, Clay (Proglacial)	Qe (QTe)
TERTIARY	Neogene	Pliocene			Lower	Chert and Quartzite Sand on Gravel (Proglacial)	Te
CRETACEOUS	Upper Cretaceous	Maastrichtian (71)	Montana	Frenchman		Sand and Silt	Kf (Kfwe)
				Battle		Sand, Silt and Clay	Kbt
				Whitemud		Sand and Clay	Kw
				Eastend		Sand and Silt	Ke
		Campanian (84)		Bearpaw	Aquadell	Silt and Clay	Kbaq (Kb)
					Cruikshank	Sand and Silt	Kbc
					Snakebite	Silt and Clay	Kbs
					Ardkenneth	Sand and Silt	Kba
					Beechy	Silt and Clay	Kbby
					Demaine	Sand and Silt	Kbd
					Sherrard	Silt and Clay	Kbsh
					Matador	Sand and Silt	Kbm
					Broderick	Silt and Clay	Kbbd
					Outlook	Sand and Silt	Kbok
					Unnamed	Silt and Clay	Kbu¹
				Judith River (Belly River) (Oldman)	Oldman	Sand and Silt	Ko (Kjr)
					Foremost	Sand and Silt	Kfm
				Lea Park	Grizzly Bear	Silt and Clay	Kgb (Klp)
					Ribstone Creek	Sand and Silt	Krc
					Vanesti	Silt and Clay	Kva
					Victoria	Sand and Silt	Kvi
						Silt and Clay	Klp
						Silt and Clay	Klp
				Alderson (Milk River)		Silt and Clay	Kal
		Santonian (86)	Colorado – Upper	First White Speckled Shale		Silt and Clay (Speckled)	Kfws (Kc)
		Coniacian (89)		Niobrara		Silt and Clay	Kn
		Turonian (93)		Morden		Silt and Clay	Kmd
				Favel		Silt and Clay (Speckled)	Kf
		Cenomanian (99)	Colorado – Lower	Belle Fourche		Silt and Clay	Kbf
				Fish Scales		Silt and Clay (Fish Debris)	Kfs
	Lower Cretaceous	Albian		West Gate		Silt and Clay	Kwg
				New Castle		Sand and Silt	Knc
				Joli Fou (Skull Creek)		Silt and Clay	Kjf
			Mannville (Blairmore) (Swan Hills)				Km

Major unconformity
Not to Scale

Lithology

- Fill
- Topsoil
- Clay or Shale
- Silt
- Sand
- Gravel
- Oxidized Till
- Unoxidized Till

WELL AND WATER LEVEL DATA

WWDR WATER LEVEL DATE

SCREEN LENGTH

LIMITATIONS

1) EXCEPT AT BOREHOLE SITES WHERE GEOLOGIC LOGS ARE AVAILABLE, GEOLOGIC CONTACTS ARE INFERRED AND REPRESENT GEOLOGIC MODELS THAT ARE BELIEVED TO BEST FIT THE INFORMATION.
2) INTERPRETATIONS BETWEEN HOLES ARE LINEAR AND MAY NOT EXACTLY MATCH INTERPOLATIONS FROM OTHER MAPS, PARTICULARLY WHERE BOREHOLES DO NOT INTERSECT ENTIRE STRATIGRAPHIC PROFILE.
3) MDH ENGINEERED SOLUTIONS CORP, MEMBER OF THE SNC–LAVALIN GROUP, AND/OR THE SASKATCHEWAN WATER SECURITY AGENCY WILL NOT BE LIABLE FOR ANY DECISIONS BASED ON OR INFLUENCED BY DATA AND INTERPRETATIONS PROVIDED ON THIS CROSS–SECTION; SITE SPECIFIC INVESTIGATIONS ARE ALWAYS REQUIRED.
4) NO INTERPRETATIONS OF SEDIMENTS BELOW Klp MADE UNLESS ENCOUNTERED IN A BOREHOLE USED ON THE CROSS–SECTION.
5) BEDROCK GEOLOGY AND STRUCTURE IS BASED ON INTERPRETATION FROM OFF–SECTION EXPLORATION HOLES PROVIDED FROM THE WILLISTON BASIN TGI DATABASE. BEDROCK STRATIGRAPHY COULD BE SIGNIFICANTLY DIFFERENT THAN PROVIDED.

REVISIONS No.	DATE	DESCRIPTION	GEO.	DRN.	CHK.	APP.

DRAWING STATUS	DATE
PRELIMINARY	
DESIGN REPORT	
APPROVED FOR TENDER	
APPROVED FOR CONSTRUCTION	
RECORD OF CONSTRUCTION	

		DATE
SCALE	H 1:100,000 V 1:2,000	
GEOLOGY BY	R. NORMAN, P.Geo.	03–JAN–12
DRAWN BY	M. FORTIER / E. OVCINA / P. BIRNIE	29–MAY–13
CHECKED BY	R. NORMAN, P.Geo.	03–MAY–13
APPROVED BY	G. POTTER, M.Sc., P.Eng., P.Geo.	29–MAY–13

CLIENT: Water Security Agency

PRODUCED BY: MDH ENGINEERED SOLUTIONS, Member of the SNC-LAVALIN Group

TITLE: CROSS SECTION B–B'

PROJECT No. M2749–1030110 APPENDIX C

DRAWING No. M2749–62–2 REV.