Sediment Unit*			Lithology with simplified vertical stratigraphic sequence differentiation	Geologic Setting	Distribution Nature	Nature of upper surface	Geotechnical Parameters							Perceived Engineering Factors	Typical Sediment Thickness Range	Comments on thickness	Sediment mobility**
							Cone resistance (MPa)****	Unit Weight (kN/m3)	Undrained Shear Strength (kPa)	Moisture Content (%)****	Plasticity Index (PI)****	Friction Ratio, Rf (%)****	Internal Friction Angle (deg.)				
2. Total Quaternary section	7. post-glacial sand and gravel	sand; minor silt and gravel	fine silty sand with gravel and shells	*below paleo-low-stand**** ; Smooth-surfaced blanket deposit, sand dominated in some areas and gravel dominated in others, usually overlying glacial till. Reaches several meters thick, such as partially filling iceberg scours but locally thins to zero, yielding patchy distribution where gravelly underlying surface protrudes	discontinuous blanket	near planar; minor relief where iceberg scoured	5 - 10	16 - 20	20	ainly according to gravel co		< 1		loose sediment; some sediment suspension and redistribution; low repose angles	0 to 3 m	sand mainly accumulated in local topographic lows (e.g. base of paleo iceberg scours); thins gradually toward greater water depths	rare, small bedforms; little mobility
		sand dominant	medium to coarse sand and fine gravel and some shells, well sorted. Includes occasional superimposed fine gravel and shell patches	*above paleo-low-stand**** ; distribution largely a function of bedform distribution stemming from during period of lower sea-level; shoreface-connected sand ridges represent largest sand bodies; elsewhere thin and patchy with patchyness controlled by bedform type and degreee of development	continuous blanket in thick bedforms; patchyness is common where thin	near planar; minor relief where iceberg scoured; (less than 2 m) or large bedforms (less than 1 m), o rsmall bedforms (cm to 10s cm) or sand ridges (up to several m)	<15	18.0 - 21.0		15 - 20		< 1	36 - 42	loose sediment; some sediment suspension and redistribution; low repose angles	Generally 1 to 3 m thick, but can occur up to 10 m in sand ridges	sand thickness mainly a function of the height of moribund sand ridges; very thin in ridge troughs up to many m thick at ridge apex; only cms to 10s cm thick in sandwaves and ripples	rare, small bedforms recognized; little mobility
		gravel dominant	gravel cobbles and boulders, minor sand; local erosional remnants of till	basal gravel lag from paleo-coastal working; well developed near *paleo-low-stand ****	near-continuous blanket; commonly sand-covered	near planar; minor relief where iceberg scoured		20.0 - 22.5		20			38 - 45	boulders on upper surface and possibly embedded in cohesive matrix (till) below; unlikely that "hardground" (see unit 3) also occurs in this unit	1 to 2m	thickness of gravel lag unresolved; likely < 1 m but may be up to a few metres	n/a
	6. Post-Till Muds	8. post-glacial marine mud	Cohesive and soft silt and clay with minor sand. Rare Ice-Rafted Detritus (IRD) including gravel	Soft clay and silt ponded in basins Restricted to inner bays and deepest parts of Downing Basin, unmapped occurrences are also present in small mid-self basins. Smooth surfaces are Soft clay and silt ponded in basins; up to 15 m thick; restricted to inner bays and deepest parts of large and small shelf-situated basins; subtly conformable to onlapping internal stratification.	continuous blanket	generally smooth; occassionaly relict iceberg-scoured (not unit 9) or local thin sand with minor gravel		17.5 - 19.5	10 - 90; typically < 35	20 - 65				uppermost muds are soft; limited area of shallow gas in glacial sediments	1 to 10 m, locally thicker in fjords and fjord-like bays	generally continuous blanket, strong trend to thickening basinward	rare; possibly thin sand mobility layer at base of steepest slopes but this is likely relict
	4. uppermost Till and post-till muds	5. glacimarine mud	Cohesive, poorly sorted sandy, silty clay with rare IRD-derived gravel	Mud-dominated deposits; proximal and distal proglacial, rapidly deposited in quiescent (sub-glacial or sub-sea-ice). Poorly sorted, cohesive, relatively barren, sandy, clayey, silt, with minor gravel. Can be laminated or banded on local and regional scales. Conformably overlies basal unit. Generally confined to large and small basins and channels. Local unconformities in channel infill in shallow central shelf area	continuous blanket	Smooth, unscoured (by paleo icebergs) surface for proximal, stratified, draped muds; Occurrences above paleo- iceberg scour depth are turbated, some completely, and have iceberg scour pattern with surface relief of metres								numerous narrow glacial sediment-filled buried channels, both mapped and unrecognized represent a contrast with adjacent, non- channelized surroundings	1 to 10's of m	generally continuous blanket, strong trend to thickening basinward	rare; possibly thin sand mobility layer at base of steepest slopes but this is likely relict
	3. Till	latest (uppermost) till	generally cohesive diamict (poorly sorted clay and silt with gravel cobble and boulders embedded in the matrix), boulders can be larger than 1 m diameter, more concentrated gravel, cobble and boulder content at upper surface; possibly gravel layers, especially where tills are stacked; local overlying sand veneer	Deposited beneath glacier. Occurs as blanket or ground moraine, terminal moraines and rarely as till tongues (wedges deposited at glacier terminus during glacial retreat). Generally thin(<15m) on outer and inner shelf; locally thick (>80m) in shelf-crossing troughs and some bank areas where stacked tills developed (mainly NE NL shelf area). Overlies bedrock in most areas.	continuous blanket, sheet or ridge	Glacial sculpting (depositional and erosional) creates regional ridges and troughs and channels with tens of m relief across many km. NE NL shelf area has examples of very high roughness due to glacitectonics. Local smaller scale roughness due to relict iceberg scour with several metres relief across 10's to 100's metres	6 - 20	18.0 - 20.0	typically less than 100; some tills < 25; can be over 500	16 - 45 typically 30 - 40	N/A; effective cohesion 25 to 35 kPa	3 - 8	35 - 43	spatially variable overburden thickness; Overburden is cohesive with boulders, mostly concentrated at seabed; extent of weakest tills is restricted; relict iceberg scours with cobble/boulder berms create relief of metres over horizontal spans of 10s to 100s m; no surficial sand mobility with exception of rare, small fields; numerous communications cables	highly variable (0 to 100s m); generally thickest in shelf-crossing troughs	locally reduced confidence identifying overburden thickness due to strong acoustic scattering with highest resolution seismic systems	little sand therefore little mobility; isolated small bedform fields
		older and basal tills					30-60	21.0 - 22.5	110 to 170 typical; 200 and > 500 locally	19-20			32 - 46	as above but high strength may also be a factor; "hardground" experienced in outer shelf areas- may be largely a digenetic "bedrock" phenomenon (de-watering, cementation?) but may also be an old (high strength) till phenomenon			

* generic and stratigraphic classification as in Section 6.1 of report

** Sediment mobility modeling suggests seabed stress sufficient to mobilize the sediment on a frequent basis (during most storms) in areas shallower than 100m. Similarity of textural details over multiple years suggests little uni-directional or long-distance flux.

***Paleo-low-stand of sea-level during the latesst and post-glacial phase of low sea-level was situated at about 110 m in outer shelf, 75 m in inner shelf, 50 m in southern NL inner bays

****From Sonnichsen and King, 2002