Appendix I Units in updated integrated geological model

Table I-1 Summary of units in the integrated geological model.

Unit	Base Hori-zon	Seismic Character	Soil Type according to the borehole descriptions. (Ordered by frequency) Ref. /1/	Age – chrono-stratigraphic group	Depositional Environment
Unit 10	H10	Acoustically semi-transparent in the thickest deposits of the sand dunes. In the shallower deposits semi-parallel to parallel reflector of medium amplitude.	SAND, Silty SAND, Gravelly SAND, Sandy CLAY, Silty Gravelly SAND	Holocene	Marine
Unit 11	H11	Transparent to chaotic reflectors. Mostly low amplitude but includes positive high amplitude reflectors.	SAND	Holocene	Coastal marine
Unit 12	H12	Facies is partly transparent and with parallel reflectors. Some areas are semi-chaotic with high amplitude reflectors.	SAND, Silty SAND, SILT, Clayey SILT, Sandy CLAY	Holocene	Lagoonal marine
Unit 13	H13	Low amplitude parallel reflectors. Strong basal reflector.	Sandy CLAY, CLAY	Holocene	Transition from fluvial to lagoonal.
Unit 14	H14	In the western area transparent to slightly laminated facies. Low amplitude reflectors. In the more eastern area slightly undulating reflectors with low to high amplitude reflectors.	SAND, CLAY	Holocene	Fluvial

Unit	Base Hori-zon	Seismic Character	Soil Type according to the borehole descriptions. (Ordered by frequency) Ref. /1/	Age – chrono-stratigraphic group	Depositional Environment
Unit 15	H15	Semi chaotic to parallel reflectors with low to high amplitude. Reflectors are slightly undulating.	CLAY	Holocene	Lacustrine depression infill
Unit 16	H16	Parallel to undulating to chaotic reflectors. Low to medium amplitude reflectors. Some infill shows deformation structures and slight transparency. Most chaotic towards the bottom.	SAND, Silty SAND, Clayey SILT, Silty CLAY (CPT Only)	Late Weichselian	Mainly Subglacial fluvial /proglacial lacustrine
Unit 17	H17	Semi parallel medium to low amplitude reflectors. Some deformed blank and undulating areas.	CLAY, Silty SAND, Gravelly SAND	Late Weichselian	Periglacial or Proglacial lacustrine channel infill.
Unit 18	H18	Mostly transparent facies. Occasionally high amplitude chaotic reflectors and semi parallel facies.	Silty CLAY, Sandy CLAY, Silty gravelly SAND,	Late Weichselian	Proglacial lacustrine
Unit 19	H19	Chaotic low to medium amplitude reflectors. Some instances of deformed facies and some parallel to undulated facies.	SAND, Sandy GRAVEL, Silty gravelly SAND	Late Weichselian	Subglacial and proglacial fluvial
Unit 20	H20	In the East transparent facies with occasional medium amplitude reflectors and some deformed areas. In the west parallel reflectors with strong amplitude and some low amplitude semi-transparent reflectors.	Sandy Gravelly CLAY, Silty SAND, Silty CLAY, Gravelly SAND, CLAY, SAND	Late Weichselian	Subglacial to proglacial fluvial and lacustrine

Unit	Base Hori-zon	Seismic Character	Soil Type according to the borehole descriptions. (Ordered by frequency) Ref. /1/	Age – chrono-stratigraphic group	Depositional Environment
Unit 21	H21	Mainly transparent facies. Instances of parallel medium to high amplitude reflectors.	CLAY, Sandy CLAY, Silty CLAY, Clayey PEAT	Late Weichselian	Periglacial fluvial to lacustrine channel infill
Unit 22	H22	Semi-chaotic medium amplitude reflectors. Some areas with low amplitude to transparent reflectors.	SAND, Silty SAND, Silty gravelly SAND	Late Weichselian	Glaciofluvial in extramargin al channel
Unit 23	H23	Deformed reflectors heavily undulated.	Silty CLAY, CLAY, Silty SAND, Clayey SILT	Weichselian	Primarily periglacial lacustrine and fluvial
Unit 24	H24	Semi-transparent facies. Some parallel reflectors.	SAND, Silty SAND, Clayey SILT, SILT	Weichselian	Periglacial fluvial
Unit 25	H25	Parallel reflectors of low amplitude.	CLAY, Silty CLAY, Silty SAND, SILT	Weichselian	Periglacial lacustrine
Unit 30	H30	Parallel medium to low amplitude reflectors.	SAND, Silty SAND	Weichselian	Periglacial fluvial
Unit 35	H35	Semi-chaotic to semi-parallel reflectors. Many internal structures. The top of the unit is occasionally semi-transparent.	Gravelly SAND, SAND, Silty SAND	Weichselian	Peroglacial fluvial
Unit 37	H37	Chaotic to undulating reflectors with low to high amplitude, occasionally transparent.	Sandy CLAY, CLAY	Saalian	Periglacial lacustrine

Unit	Base Hori-zon	Seismic Character	Soil Type according to the borehole descriptions. (Ordered by frequency) Ref. /1/	Age – chrono-stratigraphic group	Depositional Environment
Unit 38	H38	Both transparent facies with point diffraction hyperbolas and areas with semi-undulating reflectors of medium amplitude.	Silty SAND, Silty gravelly SAND, SAND	Saalian	Periglacial fluvial
Unit 40	H40_ all				
Subunit 40-01	H40-01	Transparent facies with occasional low amplitude parallel reflectors.	Clayey SILT, Silty CLAY (Based on CPT only)	Saalian	Periglacial lacustrine
Subunit 40-02	H40-02	Semi parallel towards the top and more semi-chaotic towards the bottom. Low amplitude reflectors with singular high amplitude reflectors	Silty SAND, SAND	Saalian	Periglacial lacustrine
Subunit 40-03	H40-03	Towards the top semi-parallel low amplitude reflectors. Deeper the facies are chaotic low to medium amplitude reflectors.	Silty CLAY, Silty SAND, SAND, Sandy CLAY, SILT, Sandy SILT, Sandy GRAVEL	Saalian	Sub-proglacial fluvial and proglacial lacustrine channel infill
Unit 41	H41	Semi-parallel undulating reflectors of low to medium amplitude. More chaotic reflectors towards the bottom. Occasional high amplitude areas.	CLAY	Saalian	Periglacial lacustrine
Unit 42	H42	Parallel reflections occasionally in the top, chaotic to undulating in the rest of the unit.	Silty SAND, Gravelly SAND, Sandy SILT, Silty CLAY	Saalian	Subglacial fluvial and proglacial to periglacial fluvial and lacustrine

Unit	Base Hori-zon	Seismic Character	Soil Type according to the borehole descriptions. (Ordered by frequency) Ref. /1/	Age – chrono-stratigraphic group	Depositional Environment
Unit 45	H45_ all				
Subunit 45-01	H45-01	Different facies throughout unit. Seen as semi-parallel to undulating to chaotic nature. Internal structures are apparent in the unit. Low to medium amplitude reflectors with transparent areas.	Silty SAND, Sandy SILT, SAND (Based only on CPT)	Saalian	Periglacial lacustrine
Subunit 45-02	H45-02	Low to medium amplitude chaotic reflectors.	Silty SAND, Sandy SILT, SAND, Gravelly SAND, GRAVEL (Based only on CPT)	Saalian	Subglacial and proglacial glaciofluvial to proglacial lacustrine
Unit 50	H50_ all				
Subunit 50-01	H50-01	The top has transparent reflectors and towards the bottom the facies is consisting of parallel reflectors with low to medium amplitude signal.	Clayey SILT, Silty CLAY (Based only on CPT)	Saalian	Pro- or periglacial lacustrine infill of channel.
Subunit 50-02	H50-02	Mostly chaotic low to medium amplitude reflectors. Larger structures are occasionally seen towards the top of the unit.	SAND, Silty SAND (Based only on CPT)	Saalian	Subglacial fluvial

Unit	Base Hori-zon	Seismic Character	Soil Type according to the borehole descriptions. (Ordered by frequency) Ref. /1/	Age – chrono-stratigraphic group	Depositional Environment
Unit 56	H56	Transparent facies and semi-chaotic low to medium amplitude reflectors	Silty SAND, CLAY,	Saalian	Periglacial lacustrine to fluvial
Unit 57	H57	Mostly transparent facies with some areas of semi parallel reflectors of low amplitude.	Silty SAND, Sandy SILT, Silty gravelly SAND	Saalian	periglacial fluvial or fluvial
Unit 58	H58	Parallel to semi parallel reflectors in the top. Overlapping structures of low to medium amplitude reflectors towards the bottom.	Silty gravelly SAND, Silty SAND	Saalian	Periglacial fluvial
Unit 59	H59	Semi chaotic reflectors of low to medium amplitude	SAND, Silty SAND,	Saalian	Periglacial fluvial
Unit 65	H65	Mostly transparent facies occasionally with some deformed structures.	SAND, Silty SAND, Gravelly SAND, Silty SAND, Sandy SILT (Based only on CPT)	Elsterian	Subglacial fluvial
Unit 70	H70_ all				
Subunit 70-01	H70-01	Semi parallel to chaotic reflectors of low to medium amplitude.	Clayey SILT, Silty CLAY, SAND, Silty SAND (Based only on CPT)	Elsterian	Proglacial lacustrine channel infill
Subunit 70-2	H70-02	Seemingly deformed chaotic reflectors of low to high amplitude.	Clayey SILT, Silty CLAY, SAND, Silty SAND (Based only on CPT)	Elsterian	Deformed clay, uncertain

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Subunit 70-3	H70-3	Semi-transparent/chaotic reflectors at the top of the unit. Semi-parallel reflectors of low amplitude at the bottom.	Silty CLAY	Elsterian	Proglacial lacustrine channel infill
Subunit 70-04	H70-04	Mix of semi-parallel, chaotic and transparent facies.	SAND, Silty SAND, Clayey SILT, Silty CLAY, Sandy SILT (Based only on CPT)	Elsterian	Proglacial lacustrine to fluvial channel infill
Subunit 70-05	H70-05	Undulating to chaotic reflectors of low to high amplitude.	Clayey SILT, Silty CLAY, CLAY, Silty SAND, Sandy SILT (Based only on CPT)	Elsterian	Proglacial laucustrine and subglacial fluvial
Subunit 70-06	H70-06	Semi-parallel undulating reflectors to chaotic facies. Predominantly low-medium amplitude reflectors.	No data	Elsterian.	Proglacial laucustrine
Subunit 70-07	H70-07	Chaotic to deformed facies with low amplitude reflectors.	Silty CLAY	Elsterian	proglacial fluvial and lacustrine
Subunit 70-08	H70-08	Mixture of parallel, undulating, and chaotic reflectors of low to medium amplitude reflectors.	Silty CLAY	Elsterian	Proglacial lacustrine
Subunit 70-09	H70-09	Mixture of parallel, semi-undulating and chaotic reflectors of low to medium amplitude reflectors.	CLAY, SAND, GRAVEL, Clayey gravelly SAND	Elsterian	Mainly proglacial lacustrine

Unit	Base Hori-zon	Seismic Character	Soil Type according to the borehole descriptions. (Ordered by frequency) Ref. /1/	Age – chrono-stratigraphic group	Depositional Environment
Subunit 70-10	H70-10	Semi-chaotic low amplitude reflectors	Silty SAND, Silty CLAY, Sandy gravelly CLAY, CLAY, SILT, SAND, Silty gravelly SAND, GRAVEL, Silty sandy GRAVEL	Elsterian	Subglacial fluvial and till, proglacial fluvial and -lacustrine
Subunit 70-11	H70-11	Generally a highly chaotic unit with low to medium amplitude reflectors. Occasionally more structures reflectors towards the top	Silty Gravelly SAND,	Elsterian	Subglacial fluvial to proglacial lacustrine
Subunit 70-12	H70-12	Highly chaotic reflectors with low to medium amplitude reflectors.	Silty CLAY, Silty gravelly SAND, GRAVEL, Sandy gravelly CLAY, SAND, Silty SAND	Elsterian	Subglacial fluvial and till
Unit 73	H73	Chaotic reflectors with signs of deformation. The facies is more transparent with deformation structures at the top of the unit.	GRAVEL, Silty SAND, Silty CLAY, Silty gravelly SAND, SILT, Gravelly SAND, Sandy GRAVEL	Elsterian	Subglacial fluvial and till mixed with Miocene deposits
Unit 75	H75	Transparent to chaotic reflectors with some higher amplitude structures.	Silty gravelly SAND, SAND, Sandy GRAVEL	Elsterian and older	Periglacial fluvial and lacustrine
Unit 85	H85	Chaotic reflectors with low to high amplitude. Often has a bright negative amplitude reflector at the bottom.	SAND, Silty SAND, Gravelly SAND, Clayey PEAT,	Elsterian and older	Glaciofluvial and pre-glacial fluvial

Unit	Base Hori-zon	Seismic Character	Soil Type according to the borehole descriptions. (Ordered by frequency) Ref. /1/	Age – chrono-stratigraphic group	Depositional Environment
Unit 89	H89	Chaotic low to medium amplitude reflectors. More transparent with deformed structures towards the top.	Silty CLAY, Sandy CLAY, Silty SAND, CLAY	Miocene (glaciotectonically deformed during Pleistocene)	Mostly marine
Unit 90	H90	Semi-transparent to chaotic low amplitude reflectors. Large scale gently sloping reflectors.	Silty SAND, Clayey SAND, SAND, Silty Gravelly SAND, Gravelly SAND, Silty SAND,	Miocene	Fluvial to Deltaic
Unit 95	H95	Different facies including chaotic with low amplitude reflectors and sub-parallel with low amplitude reflectors	Silty SAND, SAND, Sandy CLAY, CLAY, Sandy SILT, Clayey SILT, Silty CLAY	Miocene	Marine
Unit 96	(not mapped)	Sub-parallel to parallel low to medium amplitude reflectors	Silty CLAY, CLAY, Silty SAND, Sandy CLAY, Sandy SILT	Miocene	Marine