APPENDIX A

WDNR SHOREZONE INVENTORY AND KGI NEARSHORE SALMON HABITAT ASSESSMENT SUMMARY TABLES BY SHORELINE PLANNING SEGMENT

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The following shoreline characterization information has been compiled from the Washington Department of Natural Resources *ShoreZone Inventory* GIS database and the *Key Peninsula, Gig Harbor, and Islands Watershed Nearshore Salmon Habitat Assessment* (KGI Habitat Assessment) GIS database, prepared by Pentec Environmental (2003). Each table is organized by shoreline planning segment, and either the ShoreZone Units, or the Pentec Assessment Units (AUs) located within each shoreline planning segment. Figure A-1 provides a visual key to identify the extent and location of ShoreZone or Pentec AUs within each shoreline planning segment. The length of each unit shown in the tables indicates the length of the ShoreZone or Pentec AU occurring within that shoreline planning segment. Some WDNR and Pentec units cross shoreline planning segment boundaries and/or extend beyond the study area for this shoreline characterization.

Section 5.6.1 Priority Habitats and Habitats of Local Importance

Section 5.6.1.1 Marine Riparian Zones

Table A-1. Marine Riparian Zones (Pentec, 2003)

Planning Segment	KGI Assessment Unit (AU) Number	Length of KGI AU within Segment (feet)	Extent of Riparian Vegetation above OHW	Potential for Large Woody Debris Recruitment	Density of Large Woody Debris
A	1.15 (along Colvos Passage)	1355	51-100% of shoreline	yes	none
A	1.16	239	none	no	0.2 pieces per 90ft of shoreline
A	2.01	407	10-24% of shoreline	no	none
B	2.01	4560	10-24% of shoreline	no	none
B	2.02	1640	none	no	none
B	2.03	1298	10-24% of shoreline	no	none
B	2.04 (mouth of Crescent Creek)	2096	51-100% of shoreline	no	none
C	2.04 (mouth of Crescent Creek)	716	51-100% of shoreline	no	none
C	2.05	620	none	no	none
C	2.06	1140	none	no	none
C	2.07	1243	25-50% of shoreline	no	none
C	2.08	1237	none	no	none
C	2.09	4717	none	no	none
C	2.10	812	none	no	none
D	2.10	18	none	no	none
D	3.01	2394	25-50% of shoreline	no	0.2 pieces per 90ft of shoreline
D	3.02 (unarmored section of The Narrows)	9463	51-100% of shoreline	yes	1 piece per 30m of shoreline
E	7.09	507	25-50% of shoreline	no	0.2 pieces per 90ft of shoreline
E	7.10	2978	none	no	none
E	7.11 (north of Goodnough Creek mouth)	793	51-100% of shoreline	no	1 piece per 90ft of shoreline
F	7.11 (north of Goodnough Creek mouth)	339	51-100% of shoreline	no	1 piece per 90ft of shoreline
F	7.12	1143	none	no	none
F	7.13	2354	none	no	0.2 pieces per 90ft of shoreline
F	7.14	723	25-50% of shoreline	yes	0.5 pieces per 90ft of shoreline

Section 5.6.1.2 Feeder Bluffs

Table A-2. Feeder Bluffs (Pentec, 2003)

Planning Segment	KGI AU Number	Length of KGI AU within Segment (feet)	Active Feeder Bluffs ("Cliffs" contributing sediments)
A	1.15	1355	yes
A	1.16	239	no
A	2.01	407	no
B	N/A	N/A	None throughout Segment
C	N/A	N/A	None throughout Segment
D	2.10	18	no
D	3.01	2394	no
D	3.02	9463	yes
E	N/A	N/A	None throughout Segment
F	N/A	N/A	None throughout Segment

Section 5.6.1.3 Beaches and Backshore

Table A- 3. Beach Sediment Characterization (WDNR, 1997)

Planning Segment	WDNR ShoreZone Unit ID	Length of ShoreZone Unit within Segment	Estimated Sediment Source	Sediment Abundance	Dominant Sediment Transport Direction	Stability	Intertidal Biotic Assemblage
A	2965	197.3	Alongshore	Moderate	Undetermined	Stable	Sand & Gravel (7)
A	2966	323.8	Alongshore	Moderate	Undetermined	Stable	Sand & Gravel (7)
A	2967	451.5	Alongshore	Moderate	West	Stable	Sand & Gravel (6)
A	2968	1026.4	Backshore	Moderate	Undetermined	Erosional	Sand & Gravel (6)
B	2962	2928.2	Fluvial	Abundant	South	Accretional	Estuaries, Sand, Mud (8)
B	2963	785.6	Alongshore	Moderate	Undetermined	Stable	Estuaries, Sand, Mud (8)
B	2964	1757.4	Alongshore	Moderate	Undetermined	Stable	Estuaries, Sand, Mud (8)
B	2965	4125.6	Alongshore	Moderate	Undetermined	Stable	Sand & Gravel (7)
C	2956	776.4	Alongshore	Moderate	Northwest	Accretional	Sand & Gravel (6)
C	2957	1597.3	Backshore	Moderate	Undetermined	Stable	Sand & Gravel (7)
C	2958	4324.6	Backshore	Moderate	Undetermined	Stable	Estuaries, Sand, Mud (8)
C	2959	1012.0	Fluvial	Moderate	Undetermined	Stable	Estuaries, Sand, Mud (8)
C	2960	1247.2	Backshore	Moderate	Undetermined	Stable	Sand & Gravel (7)
C	2961	770.0	Backshore	Moderate	Undetermined	Stable	Estuaries, Sand, Mud (8)
C	2962	755.4	Fluvial	Abundant	South	Accretional	Estuaries, Sand, Mud (8)
D	1746	5651.8	Backshore	Moderate	Undetermined	Stable	Sand & Gravel (7)
D	1747	3600.3	Backshore	Moderate	Undetermined	Stable	Sand & Gravel (9)
D	2955	2561.5	Backshore	Moderate	Northwest	Erosional	Sand & Gravel (6)
D	2956	64.6	Alongshore	Moderate	Northwest	Accretional	Sand & Gravel (6)
E	1419	460.2	Alongshore	Moderate	North	Stable	Sand & Gravel (6)
E	1420	811.0	Alongshore	Abundant	North	Stable	Sand & Gravel (6)
E	1421	2482.5	Alongshore	Moderate	North	Stable	Sand & Gravel (9)
E	1422	488.9	Fluvial	Abundant	North	Accretional	Estuaries, Sand, Mud (8)
F	1414	442.9	Backshore	Moderate	South	Stable	Estuaries, Sand, Mud (8)
F	1415	827.7	Offshore	Moderate	North	Stable	Estuaries, Sand, Mud (8)
F	1416	797.2	Fluvial	Moderate	Undetermined	Stable	Estuaries, Sand, Mud (8)
F	1417	972.6	Fluvial	Moderate	Undetermined	Stable	Estuaries, Sand, Mud (8)
F	1418	120.4	Backshore	Abundant	North	Accretional	Estuaries, Sand, Mud (8)
F	1419	1398.3	Alongshore	Moderate	North	Stable	Sand & Gravel (6)

Table A- 4. Beach Sediment Characterization (Pentec, 2003)

Planning Segment	KGI AU Number	SEDIMENTS	KGI AU Number	SEDIMENTS	KGI AU Number	SEDIMENTS		
A	1.15	other	1.16	other	2.01	mud and fines (75-100%)		
B	2.01	mud and fines (75-100%)	2.02	mud and fines (>50%)	2.03	mud and fines (75-100%)	2.04	mud and fines (75-100%)
C	2.04	mud and fines (75-100%)	2.05	mud and fines (75-100%)	2.06	mud and fines (>50%)	2.07	mud and fines (>50%)
C	2.08	mud and fines (>25-50%)	2.09	mud and fines (>50%)	2.10	other		
D	2.10	other	3.01	other	3.02	other		
E	7.09	mud and fines (75-100%)	7.10	mud and fines (75-100%)	7.11	silty sand (>25%), mud and fines (>50%)		
F	7.11	silty sand (>25%), mud and fines (>50%)	7.12	silty sand (>25%)	7.13	mud and fines (75-100%)	7.14	mud and fines (75-100%)

Section 5.6.1.6 Eelgrass

Table A- 5. Eelgrass Distribution and Abundance (Pentec, 2003)

Planning Segment	KGI AU Number	Length of KGI AU within Segment (feet)	Eelgrass Abundance
A	N/A	N/A	none
B	N/A	N/A	none
C	N/A	N/A	none
D	N/A	N/A	none
E	7.09	507	>25% of low tide line
E	7.10	2978	>25% of total AU area
E	7.11	793	>25% of low tide line
F	7.11	339	>25% of low tide line
F	7.12	1143	none
F	7.13	2354	none
F	7.14	723	none

Section 5.6.1.8 Tidal Wetlands

Table A- 6. Extent of Tidal Marshes (Pentec, 2003)

Planning Segment	KGI AU Number	Length of KGI AU within Segment (feet)	Extent of Tidal Marshes (below OHW)
A	1.15	1355	none
A	1.16	239	none
A	2.01	407	<5' wide and <25% of shoreline
B	2.01	4560	<5' wide and <25% of shoreline
B	2.02 (adjacent to Randall Street boat launch)	1640	>10' wide and >50% of shoreline
B	2.03 (near mouth of Crescent Creek)	1298	>5' wide and >50% of shoreline OR >10' wide over 25-50% of shoreline
B	2.04 (mouth of Crescent Creek)	2096	>10' wide and >50% of shoreline
C	2.04 (mouth of Crescent Creek)	716	>10' wide and >50% of shoreline
C	2.05 (near mouth of Crescent Creek)	620	>5' wide and >50% of shoreline OR >10' wide over 25-50% of shoreline
C	2.06	1140	<5' wide and <25% of shoreline
C	2.07	1243	<5' wide and <25% of shoreline
C	2.08	1237	none
C	2.09	4717	none
C	2.10	812	none
D	2.10	18	none
D	3.01	2394	none
D	3.02	9463	none
E	7.09	507	<5' wide and <25% of shoreline
E	7.10	2978	none
E	7.11	793	<5' wide and <25% of shoreline
F	7.11	339	<5' wide and <25% of shoreline
F	7.12	1143	none
F	7.13 (mouth of Purdy Creek)	2354	>10' wide and >50% of shoreline
F	7.14	723	<5' wide and <25% of shoreline

Section 5.6.2 Priority Species and Species of Local Importance

Section 5.6.2.3 Forage Fish

Table A- 7. Potential Forage Fish Habitat (Pentec, 2003)

Planning Segment	KGI AU Number	Length of KGI AU within Segment (feet)	Potential Forage Fish Habitat
A	1.15	1355	Potential (along Colvos Passage)
A	1.16	239	none
A	2.01	407	none
B	2.01	4560	none
B	2.02	1640	none
B	2.03	1298	none
B	2.04	2096	none
C	2.04	716	none
C	2.05	620	none
C	2.06	1140	none
C	2.07	1243	Potential (mouth of Donkey Creek)
C	2.08	1237	none
C	2.09	4717	none
C	2.10	812	none
D	2.10	18	none
D	3.01	2394	none
D	3.02	9463	Potential (unarmored area along The Narrows)
E	7.09	507	Potential (entire Segment)
E	7.10	2978	Potential (entire Segment)
E	7.11	793	Potential (entire Segment)
F	7.11	339	Potential (north of Goodnough Creek)
F	7.12	1143	none
F	7.13	2354	none
F	7.14	723	none

Section 6. 2 Shoreline Modifications

Table A- 8. Shoreline Modifications from KGI Habitat Assessment (Pentec, 2003)

Planning Segment	KGI AU Number	Length of KGI AU within Segment (feet)	% of Shoreline Armoring	Piers, Docks, Bridges	% of Littoral Area Shaded by Structures	Frequent Scour, Oil Spills, or Dredging
A	1.15	1355	none	none	none	no
A	1.16	239	none	none	none	no
A	2.01	407	51-100% below MHHW	2 or more piers/docks >8' wide; OR 1 pier/dock >25' wide	none	no
B	2.01	4560	51-100% below MHHW	2 or more piers/docks >8' wide; OR 1 pier/dock >25' wide	none	no
B	2.02	1640	10-50% below MHHW	2 or more piers/docks >8' wide; OR 1 pier/dock >25' wide	none	no
B	2.03	1298	10-50% below MHHW	none	none	no
B	2.04	2096	none	1 pier/dock >8' wide	none	no
C	2.04	716	none	1 pier/dock >8' wide	none	no
C	2.05	620	51-100% below MHHW	1 pier/dock >8' wide	none	no
C	2.06	1140	51-100% below MSL	2 or more piers/docks >8' wide; OR 1 pier/dock >25' wide	10-30%	**yes**
C	2.07	1243	10-50% below MSL	none	none	no
C	2.08	1237	51-100% below MSL	2 or more piers/docks >8' wide; OR 1 pier/dock >25' wide	30-50%	**yes**
C	2.09	4717	51-100% below MSL	2 or more piers/docks >8' wide; OR 1 pier/dock >25' wide	10-30%	**yes**
C	2.10	812	51-100% below MHHW	2 or more piers/docks >8' wide; OR 1 pier/dock >25' wide	none	no
D	2.10	18	51-100% below MHHW	2 or more piers/docks >8' wide; OR 1 pier/dock >25' wide	none	no
D	3.01	2394	10-50% below MHHW	2 or more piers/docks >8' wide; OR 1 pier/dock >25' wide	10-30%	no
D	3.02	9463	none	none	none	no
E	7.09	507	51-100% below MSL	none	none	no
E	7.10	2978	51-100% below MHHW	none	none	no
E	7.11	793	10-50% below MHHW	none	none	no
F	7.11	339	10-50% below MHHW	none	none	no
F	7.12	1143	51-100% below MHHW	2 or more piers/docks >8' wide; OR 1 pier/dock >25' wide	none	no
F	7.13	2354	51-100% below MHHW	1 pier/dock >8' wide	none	no
F	7.14	723	51-100% below MHHW	none	none	no

Table A- 9. Shoreline Modifications from ShoreZone Inventory (WDNR, 1997)

Planning Segment	WDNR Unit ID	Length of ShoreZone Unit within Segment	Total % Modified	Primary Type and % of Modification	Secondary Type and % of Modification	Tertiary Type and % of Modification	# of Boat Ramps	# of Piers or Docks	Approx. # of Rec. Slips
A	2965	197.3	90	Concrete Bulkhead (70%)	Riprap (20%)		0	33	100
A	2966	323.8	0				0	0	0
A	2967	451.5	50	Concrete Bulkhead (50%)			0	0	0
A	2968	1026.4	20	Riprap (10%)	Wooden Bulkhead (10%)		0	0	0
B	2962	2928.2	10	Landfill (10%)			0	1	2
B	2963	785.6	90	Riprap (90%)			0	0	0
B	2964	1757.4	100	Concrete Bulkhead (100%)			1	11	14
B	2965	4125.6	90	Concrete Bulkhead (70%)	Riprap (20%)		0	33	100
C	2956	776.4	100	Concrete Bulkhead (50%)	Riprap (30%)	Wooden Bulkhead (20%)	0	1	0
C	2957	1597.3	100	Concrete Bulkhead (70%)	Wooden Bulkhead (20%)	Riprap (10%)	2	11	147
C	2958	4324.6	100	Concrete Bulkhead (60%)	Wooden Bulkhead (30%)	Riprap (10%)	1	26	341
C	2959	1012.0	50	Landfill (40%)	Wooden Bulkhead (10%)		0	0	0
C	2960	1247.2	80	Wooden Bulkhead (60%)	Landfill (20%)		0	9	101
C	2961	770.0	80	Wooden Bulkhead (80%)			1	1	0
C	2962	755.4	10	Landfill (10%)			0	1	2
D	1746	5651.8	0				0	0	0
D	1747	3600.3	0				0	0	0
D	2955	2561.5	30	Wooden Bulkhead (30%)			0	19	0
D	2956	64.6	100	Concrete Bulkhead (50%)	Riprap (30%)	Wooden Bulkhead (20%)	0	1	0
E	1419	460.2	90	Concrete Bulkhead (50%)	Wooden Bulkhead (40%)		0	0	0
E	1420	811.0	0				0	0	0
E	1421	2482.5	90	Concrete Bulkhead (50%)	Wooden Bulkhead (30%)	Riprap (10%)	4	0	0
E	1422	488.9	0				0	0	0
F	1414	442.9	50	Wooden Bulkhead (40%)	Concrete Bulkhead (10%)		5	0	0
F	1415	827.7	80	Wooden Bulkhead (80%)			0	1	1
F	1416	797.2	0				0	0	0
F	1417	972.6	100	Landfill (90%)	Concrete Bulkhead (10%)		0	0	0
F	1418	120.4	70	Wooden Bulkhead (50%)	Riprap (20%)		1	0	0
F	1419	1398.3	90	Concrete Bulkhead (50%)	Wooden Bulkhead (40%)		0	0	0

Section 6.3 Opportunity Areas

Table A- 10. Opportunity Areas Identified by KGI Salmon Habitat Assessment (Pentec Environmental, 2003)

Planning Segment	KGI AU Number	Length of KGI AU within Segment (feet)	AU Habitat Quality (Modeling Score)	Relative Habitat Quality	Restoration Opportunity
A	1.15	1355	48.3	moderate	
A	1.16	239	16.0	high	
A	2.01	407	19.0	high	
B	2.01	4560	19.0	high	
B	2.02	1640	21.1	moderate	
B	2.03	1298	25.6	moderate	Riparian Enhancement? Marsh Restoration?
B	2.04	2096	59.4	low	
C	2.04	716	59.4	low	
C	2.05	620	31.2	moderate	Marsh Restoration?
C	2.06	1140	7.1	high	
C	2.07	1243	35.5	moderate	Marsh Restoration?, Riparian Enhancement
C	2.08	1237	6.8	high	
C	2.09	4717	7.7	high	Riparian Enhancement, Relic Structure Removal
C	2.10	812	9.0	high	
D	2.10	18	9.0	high	
D	3.01	2394	9.7	high	
D	3.02	9463	75.0	low	
E	7.09	507	36.1	high	Bulkhead Removal
E	7.10	2978	35.0	high	
E	7.11	793	30.4	high	Stream Mouth Restoration
F	7.11	339	30.4	high	Stream Mouth Restoration
F	7.12	1143	10.1	high	Riparian Enhancement, Relic Structure Removal
F	7.13	2354	26.5	high	Culvert maintenance, Relic Structure Removal
F	7.14	723	55.1	moderate	

Sections 7 through 12 Segment Characterizations

Table A- 11. Biological Assemblages - Segment A

WDNR Unit ID	Length	Summary of Biological Assemblages	Shoreline Type (BC classification)	Supratidal	Intertidal
2965	197.3	Dune grass (gra), sedges (sed), salt marsh (sal), rockweed (fuc), barnacles (bar), green algae (ulv), kelp (sbr, ner), eelgrass (zos)	Sand and gravel beach, narrow	**Upper Component** Seawall (concrete, riprap)	**Upper Component** Beach face (sand, pebble, cobble)
2966	323.8	Dune grass (gra), green algae (ulv), kelp (sbr)	Sand and gravel beach, narrow	**Upper Component** Beach berm (sand)	**Upper Component** Beach face (sand, pebble)
2967	451.5	Dune grass (gra), green algae (ulv), kelp (sbr)	Sand and gravel beach, narrow	**Upper Component** Beach berm (sand); seawall (concrete)	**Upper Component** Beach face (sand, pebble)
2968	1026.4	Barnacles (bar), green algae (ulv), sargassum (sar)	Sand and gravel beach, narrow	**Upper Component** High, steep cliff (till); seawall (riprap)	**Upper Component** Low inclined cliff with fan (live trees overlying till); beach face (sand); seawall (riprap) **Lower Component** Beach face (sand, pebble)

Table A- 12. Biological Assemblages - Segment B

WDNR Unit ID	Length	Summary of Biological Assemblages	Shoreline Type (BC classification)	Supratidal	Intertidal
2962	2928.2	Sedges (sed), salt marsh (tri, sal), rockweed (fuc), barnacles (bar), green algae (ulv)	Organics/fines	**Upper Component** High marsh (peat, organic litter)	**Upper Component** Beach face (veneer of pebble overlying fines/mud, sand) **Lower Component** Delta fan (organic litter overlying fines/mud)
2963	785.6	Sedges (sed), salt marsh (sal), rockweed (fuc), barnacles (bar), green algae (ulv)	Mud flat	**Upper Component** High marsh (peat, organic litter) **Lower Component** Seawall (riprap)	**Upper Component** Seawall (riprap); beach face (fines/mud) **Lower Component** Beach face (fines/mud) **Lowest Component** Beach with low tide terrace (fines/mud)
2964	1757.4	Sedges (sed), salt marsh (sal), rockweed (fuc), barnacles (bar), green algae (ulv)	Sand flat	**Upper Component** Seawall (concrete) **Lower Component** High marsh (peat overlying fines/mud, sand)	**Upper Component** Beach face (fines/mud, sand)
2965	4125.6	Dune grass (gra), sedges (sed), salt marsh (sal), rockweed (fuc), barnacles (bar), green algae (ulv), kelp (sbr, ner), eelgrass (zos)	Sand and gravel beach, narrow	**Upper Component** Seawall (concrete, riprap)	**Upper Component** Beach face (sand, pebble, cobble)

Table A- 13. Biological Assemblages - Segment C

WDNR Unit ID	Length	Summary of Biological Assemblages	Shoreline Type (BC classification)	Supratidal	Intertidal	Subtidal
2956	776.4	Green algae (ulv), kelp (sbr), sargassum (sar)	Sand and gravel beach, narrow	**Upper Component** Seawall (concrete, wood, riprap)	**Upper Component** Beach face (sand, pebble)	
2957	1597.3	Salt marsh (tri), rockweed (fuc), barnacles (bar), green algae (ulv), kelp (sbr)	Sand and gravel beach, narrow	**Upper Component** Seawall (wood); wharf, marina (wood)	**Upper Component** Beach face (sand, pebble, cobble); wharf, marina (wood)	Wharf, marina (wood)
2958	4324.6	Rockweed (fuc), green algae (ulv), kelp (sbr)	Mud flat	**Upper Component** Seawall (wood); wharf, marina (wood)	**Upper Component** Beach face (sand, fines/mud); wharf, marina (wood)	Wharf, marina (wood)
2959	1012.0	Sedges (sed), salt marsh (tri, sal), green algae (ulv), kelp (sbr)	Organics/fines	**Upper Component** Landfill (fill); seawall (wood); river channel (sand) **Lower Component** High marsh (organic litter overlying sand, fines/mud)	**Upper Component** Tidal flat (fines/mud, sand)	
2960	1247.2	Salt marsh (sal), rockweed (fuc), barnacles (bar), green algae (ulv)	Sand and gravel flat or fan	**Upper Component** Wharf (wood); landfill (fill); seawall (wood)	**Upper Component** Tidal flat (sand, pebble, fines/mud); wharf (wood)	Wharf (wood)
2961	770.0	Sedges (sed), salt marsh (sal), rockweed (fuc), barnacles (bar), green algae (ulv)	Mud flat	**Upper Component** Seawall (wood); landfill (fill) **Lower Component** High marsh (organic litter overlying sand, fines/mud, pebble); inclined beach (sand, fines/mud, pebble)	**Upper Component** Beach face (sand, fines/mud, pebble); boat ramp (concrete) **Lower Component** Beach with low tide terrace (fines/mud, sand, pebble); boat ramp (concrete)	
2962	755.4	Sedges (sed), salt marsh (tri, sal), rockweed (fuc), barnacles (bar), green algae (ulv)	Organics/fines	**Upper Component** High marsh (peat, organic litter)	**Upper Component** Beach face (veneer of pebble overlying fines/mud, sand) **Lower Component** Delta fan (organic litter overlying fines/mud)	

Table A- 14. Biological Assemblages - Segment D

WDNR Unit ID	Length	Summary of Biological Assemblages	Shoreline Type (BC class)	Supratidal	Intertidal
1746	5651.8	Rockweed (fuc), barnacles (bar), green algae (ulv), kelp (ner), sargassum (sar)	Sand and gravel beach, narrow	**Upper Component** High, steep cliff (till); steep cliff of moderate height (live trees, dune grasses overlying till) **Lower Component** Low inclined cliff, ramp (fallen trees overlying till, sand)	**Upper Component** Beach face (veneer of pebble, cobble overlying sand overlying till)
1747	3600.3	Rockweed (fuc), barnacles (bar), green algae (ulv), kelp (ner), sargassum (sar)	Sand beach	**Upper Component** High, steep cliff (till); high, steep cliff (live trees, dune grasses overlying till) **Lower Component** Low inclined cliff, ramp (fallen trees overlying till, sand)	**Upper Component** Beach face (veneer of pebble, cobble overlying sand overlying till)
2955	2561.5	Dune grass (gra), rockweed (fuc), barnacles (bar), green algae (ulv), kelp (sbr, ner), sargassum (sar)	Sand and gravel beach, narrow	**Upper Component** High, steep cliff (till); wharf (wood)	**Upper Component** Beach face (sand, pebble, cobble); wharf (wood) **Lower Component** Beach face (sand, pebble, cobble, boulder)
2956	64.6	Green algae (ulv), kelp (sbr), sargassum (sar)	Sand and gravel beach, narrow	**Upper Component** Seawall (concrete, wood, riprap)	**Upper Component** Beach face (sand, pebble)

Table A- 15. Biological Assemblages - Segment E

WDNR Unit ID	Length	Summary of Biological Assemblages	Shoreline Type (BC classification)	Supratidal	Intertidal
1419	460.2	Barnacles (bar), green algae (ulv), kelp (sbr), sand dollars (den)	Sand and gravel beach, narrow	**Upper Component** Seawall (wood, concrete)	**Upper Component** Beach face (sand, pebble, cobble)
1420	811.0	Barnacles (bar), green algae (ulv), kelp (sbr), sand dollars (den)	Sand and gravel flat or fan	**Upper Component** Beach with relic ridges (sand, pebble); inclined cliff of moderate height (sand)	**Upper Component** Beach berm (logs overlying sand, pebble) **Lower Component** Beach with bar (pebble, cobble, sand) **Lowest Component** Beach face (sand, pebble, cobble)
1421	2482.5	Barnacles (bar), green algae (ulv), kelp (sbr), sand dollars (den), eelgrass (zos))	Sand flat	**Upper Component** Seawall (wood, concrete); low inclined cliff (sand, gravel)	**Upper Component** Beach face (pebble, sand) **Lower Component** Beach with low tide terrace (sand)
1422	488.9	Dune grass (gra), salt marsh (tri), green algae (ulv), eelgrass (zos)	Organics/fines	**Upper Component** Brackish marsh (organic litter overlying sand, pebble); river channel (sand, pebble)	**Upper Component** High marsh (organic litter overlying sand) **Lower Component** Tidal flat (sand)

Table A- 16. Biological Assemblages - Segment F

WDNR Unit ID	Length	Summary of Biological Assemblages	Shoreline Type (BC classification)	Supratidal	Intertidal
1414	442.9	Salt marsh (tri), rockweed (fuc), green algae (ulv), oysters (oys), ghost/mud shrimp (cal)	Mud flat	**Upper Component** Low inclined cliff (sand, gravel); seawall (wood)	**Upper Component** Beach face (sand, pebble) **Lower Component** Tidal flat with channel (fines/mud, sand)
1415	827.7	Salt marsh (tri), barnacles (bar), oysters (oys), kelp (sbr)	Sand beach	**Upper Component** Seawall (wood)	**Upper Component** High marsh (organic litter overlying sand) **Lower Component** Beach face (sand) **Lowest Component** Tidal flat with flood tide delta (sand)
1416	797.2	Sedges (sed), salt marsh (tri)	Organics/fines	**Upper Component** Brackish marsh (organic litter overlying sand)	**Upper Component** High marsh (organic litter overlying sand) **Lower Component** Tidal flat with channel (sand, fines/mud)
1417	972.6		Organics/fines	**Upper Component** Landfill (fill, concrete)	**Upper Component** Tidal flat with channel (sand, fines/mud)
1418	120.4	Barnacles (bar), green algae (ulv)	Sand beach	**Upper Component** Seawall (wood); landfill (fill)	**Upper Component** Beach face (sand, pebble) **Lower Component** Tidal flat with channel (fines/mud, sand)
1419	1398.3	Barnacles (bar), green algae (ulv), kelp (sbr), sand dollars (den)	Sand and gravel beach, narrow	**Upper Component** Seawall (wood, concrete)	**Upper Component** High marsh (organic litter overlying sand) **Lower Component** Beach face (sand) **Lowest Component** Tidal flat with flood tide delta (sand)