

APPENDIX 23

SUMMARY OF KEY TECHNICAL PARAMETERS IN OPTION 1A

Parameter	Option 1a
Secondary Treatment plants for up to 2xADWF	<ul style="list-style-type: none"> ○ Saanich East ○ McLoughlin Point ○ West Shore
Wet weather flow plants for 2x up to 4x ADWF	<ul style="list-style-type: none"> ○ Clover Point
Bypassing of Flows over 4xADWF	<ul style="list-style-type: none"> ○ Saanich East ○ Clover Point ○ McLoughlin Point & existing facility at Macaulay Point ○ West Shore
Clover Point plans	<ul style="list-style-type: none"> ○ Wet weather flow plant
West Shore Treatment & Plans	<ul style="list-style-type: none"> ○ For tributary flow from West Shore catchment only
Biosolids drying, processing & digestion on-site with WWTP	<ul style="list-style-type: none"> ○ West Shore
Biosolids drying, processing & digestion offsite of WWTP	<ul style="list-style-type: none"> ○ Hartland Site for McLoughlin Point WWTP
Pumping Stations & Forcemains	<ul style="list-style-type: none"> ○ Saanich East (on-site PS) ○ Clover Point PS & FM to McLoughlin WWTP ○ Macaulay Point PS & FM to McLoughlin WWTP
Conveyance piping requirements	<ul style="list-style-type: none"> ○ Saanich East: Piping from tributary area to WWTP ○ Clover Point: Piping from tributary area to PS. FM & tunnel to McLoughlin WWTP. ○ Macaulay Point: Piping from tributary area to PS. FM to McLoughlin WWTP. ○ West Shore: Piping from tributary area to WWTP.
Outfall Requirements	<ul style="list-style-type: none"> ○ Saanich East: New 900 mm outfall parallel to existing 600 mm outfall. ○ Clover Point: Existing 1050 mm outfall. ○ McLoughlin Point/Macaulay Point: New 1500 mm outfall parallel to existing 1050 mm outfall. ○ West Shore: New 1500 mm outfall
Sludge Transportation	<ul style="list-style-type: none"> ○ Pump to Hartland site or other selected site ○ West Shore
Land acquisition requirements (including DND lands)	<ul style="list-style-type: none"> ○ Saanich East ○ Clover Point (use existing CRD lands) ○ McLoughlin Point (Possible minor DND joint use) ○ West Shore
Staging and Phasing of Major Components	<ul style="list-style-type: none"> ○ McLoughlin Point (MBR) (Years 2030 & 2065) ○ West Shore (Years 2030 & 2065)

Engineering/Technical Assumptions

	Option 1a
Treatment technologies assumed in analysis	<ul style="list-style-type: none"> ○ Chemical Enhanced High Rate Primary with Lamella Plate (CEPT) ○ Ballasted Primary (Actiflo) ○ Biological Aeration Filter (BAF) ○ Membrane Bioreactor (MBR) ○ Conventional Activated Sludge (CAS)
Tankage	<ul style="list-style-type: none"> ○ Reinforced concrete with Cover
Phasing of Engineering Equipment	<ul style="list-style-type: none"> ○ Phase 1 Completion – Year 2016 ○ Phase 2 Expansion - Year 2030
Design Flow Capacity Planning & Population Assumptions	<ul style="list-style-type: none"> ○ Secondary: 2 x ADWF (1.75 x ADWF for East Saanich) ○ Primary: 2 to 4 x ADWF ○ Bypass (Screen only): Over 4x ADWF ○ Phase 1 – Year 2030 (420,000 persons) ○ Phase 2 – Year 2065 (600,000 persons)
Water Chemistry Assumptions	<p>Average Wastewater Quality:</p> <ul style="list-style-type: none"> ○ BOD: 240 mg/L ○ TSS: 195 mg/L
Effluent quality assumptions	<ul style="list-style-type: none"> ○ CCME National Performance Standards ○ c BOD \leq 25 mg/L ○ TSS \leq 25 mg/L
Chemical and flocculent usage	<ul style="list-style-type: none"> ○ Alum: 1,995 tonne/yr ○ Polymer: 37 tonne/yr ○ Chlorine: 343 tonne/yr ○ Thickening Polymer: 54 tonne/yr ○ MBR Cleaning Chemicals: <ul style="list-style-type: none"> - Hypochlorite: 130,000 L/yr - Citric Acid: 88,000 L/yr ○ Biosolids Treatment Chemicals
Energy consumption	<ul style="list-style-type: none"> ○ 92,166,109 kWh/year on Year 2030 loading
Labour and shifts	<ul style="list-style-type: none"> ○ 39 persons / 2 shifts

Resource Recovery Assumptions

	Option 1a
Heat energy recovery from effluent	Year 2016: 57,859 GJ/yr Year 2030: 327,197 GJ/yr Year 2065: 964,570 GJ/yr
Biosolids energy generation (e.g. methane, biodiesel)	123,237 GJ/yr
Water reuse	1,190 ML/yr
Flow energy management and pressure energy recovery	<ul style="list-style-type: none"> ○ Reclaimed Water ○ Saleable Heat Extraction
Greenhouse gas management and carbon credits	<ul style="list-style-type: none"> ○ Unit: tonne CO₂e/Yr ○ Saleable Heat: -16,307 ○ Biosolids Fertilizer Offset: -189 ○ Carbon Sequestration (Soil Amendment & Willow Coppice): -498 ○ Dried Product Fuel Offset (Cement kiln, etc.): -1,742 ○ Willow Coppice Offsets (burning wood): -736 ○ Biocell Landfill Gas Offset: -851 ○ Gas Sale Carbon Offset: -6,199 ○ Struvite Offset: -250
Nitrogen and phosphorus recovery	<ul style="list-style-type: none"> ○ Phosphorus: 250 tonne/yr
Biosolids end-use	<ul style="list-style-type: none"> ○ For Cement Kiln: 1,382 tonne/yr ○ For Soil Amendment: 553 tonne/yr ○ For Wood Coppice: 277 tonne/yr ○ From Biocell: 533 tonne/yr
GhG profile	<ul style="list-style-type: none"> ○ Unit: tonne CO₂e/Yr ○ Construction: 15,516 ○ Power for Conveyance: 183 ○ Liquid Stream Treatment: <ul style="list-style-type: none"> ● Power for Treatment (electricity): 3,071 ● Power for Heat Pump: 3,182 ● Direct Emissions (CH₄ & N₂O): 12 ○ Solids Treatment: <ul style="list-style-type: none"> ● Power for Treatment (Biosolids treatment & Scrubbing): 1,213 ● Treatment Chemicals : 195 ● Direct Emissions (CH₄ & N₂O): 49 ● Power for Soil Amendment Blending: 12