EXHIBIT D - PROJECT

D.1.1 INTRODUCTION

1. This section describes the proposed Project construction methods, engineering design specifications, and testing methodology and procedures. The proposed Project schedule, including key milestone dates, are also included as evidence to this Application. Refer to Exhibit D.1.6 for the anticipated Project schedule and milestones.

D.1.2 PROJECT CONSTRUCTION METHODS

The pipeline construction process includes various activities as described below:

1. Site Preparation and Clearing: The first activity is typically the survey and staking, which delineate the boundaries of the ROW and temporary work areas. Next, the RoW and temporary work areas are cleared of brush and trees where required. Safety fence is installed at the edge of the construction RoW where public safety considerations are required, and aspects of the traffic management plan are implemented (i.e., signs, vehicle access). Silt fence is installed at required locations.

2. Grading and Stripping: The RoW is graded where required to allow for access by construction equipment. At this stage, the topsoil (on agricultural lands) or the duff layer (on natural lands) is stripped by bulldozers and graders then segregated so it will not be mixed with the subsoil later removed from the HDD entry and exit pits. Existing landscaping is also removed (if required), and dewatering undertaken, where necessary.

3. Stringing: Stringing is the process where pipeline sections are delivered to the RoW and placed on wood skids at the pipe laydown area.

4. Pipe Fabrication: The pipeline is welded into a continuous length. The pipe welds are non-destructively tested (e.g. x-ray) and coated.

5. Horizontal Directional Drilling (HDD): The drill pad set up area is graded; Temporary Work Space is prepared for stringing of the drill pull section and entry and exit pits are excavated. The pipeline is then installed utilizing HDD.

6. Backfilling: During backfilling the originally excavated subsoil is placed over the pipe in the entry and exit pits. The pipe will be sand-padded to protect the coating. Topsoil is then replaced.

7. Hydrostatic Testing: The pipeline is pressure tested by filling the pipe with water and holding it at a high pressure for a set period of time, typically 8 hours. Water is typically drawn from nearby source if available. Municipal water may also be used for hydrostatic testing. The suitable water source is determined based on discussions with the appropriate authorities. Upon completion of the hydrostatic testing, the pipeline is drained and dried, purged of air and then put into service.

8. Clean-Up and Restoration: Clean-up is the restoration of the RoW and other work areas. On agricultural land this may require decompaction of the subsoil to maintain productivity. In natural areas, clean-up restores the environment including re-seeding of the ROW and returning the topography after grading. Any erosion and sediment controls installed during construction are also removed. Clean-up will also restore landscaping, laneways and driveways

D.1.3 DESIGN SPECIFICATIONS

Table D.1.3-1 provides the existing pipe specifications at East 16 Mile Creek Crossing and Table D.1.3-2 provides the design specifications for the pipe, fittings and associated equipment used to construct the Project and are in compliance with CSA Z662-19.

Table D.1.3-1: Existing Pipe Specifications at East 16 Mile Creek Crossing

Name	From	To	Year Built	O.D. (mm)	W.T (mm)	Type and Grade	SMYS (mpA)	Coating	Product	MOP (kPag)
SCPL NPS 12	Waterdown	North York	1973	323.9 [NPS12]	6.351 [0.25 in.]	ERW API 5L X52	359 [52 ksi]	Extruded Polyethylene (YJ®)	LVP (Refined Product)	9,930 [1,440 psig]

Note:

1. *As per SCPL In-line Inspection (ILI) data.*

Table D.1.3-2: Replacement Pipe Specifications

Description	O.D. (mm)	W.T. (mm)	Grade & Type	External Coating
NPS 12 Line Pipe Replacement	323.9 [NPS12]	12.72 [0.500 in.]	CSA Z245.1 Gr. 448 Cat. II M20C ERW/SEAMLESS1	Dual Layer Abrasion Resistant Fusion Bonded Epoxy (FBE) CSA Z245.20-18 System 2B3
NPS 12 Transition Pieces	323.9 [NPS12]	12.72 [0.500 in.]	CSA Z245.1 Gr. 359 Cat. II M20C ERW/SEAMLESS1	Two Part Liquid Epoxy CSA Z245.30-18 System FC1/FC33
NPS 12 Induction Bends	323.9 [NPS12]	12.72 [0.500 in.]	CSA Z245.1 Gr. 448 Cat. II M20C ERW/SEAMLESS1	Two Part Liquid Epoxy CSA Z245.30-18 System FC1/FC3

Notes:

1. Line pipe specifications verified by Combined Stress Calculations and stress analysis.
2. Refer to 110904260PL-CAL0002 R0 for CSA Combined Stress Calculations.
3. Coating to meet requirements from CSA Z662-19, CSA Z245.20-18, CSA Z245.30-18.

DESIGN PRESSURE (MOP): For SCPL NPS 12: 9,930 kPag (1,440 psig)

DESIGN TEMPERATURE CONDITIONS:

- Installation: > 0°C
- Pressure Test: > 2°C
- Start-Up: > 0°C and < 28°C

- Operation: > -10°C and < 40°C
- Minimum Design Temperature: -20°C
- Maximum Allowable Temperature Differential: 60°C

OPERATING TEMPERATURE: Ambient (Soil Temperature)

CRITICAL UNDERGROUND EXTERNAL TEMPERATURE: U/G Piping: -10°C

CORROSION ALLOWANCE: 0.0 mm

CLASS LOCATION: 2

DESIGN FACTOR: 0.800 (As per CSA Z662-19)

LOCATION FACTOR: 0.900 (As per TSSA FS-238-18 and CSA Z662-19 Clause 4.3.7.4)

JOINT FACTOR: 1.000

TEMPERATURE FACTOR: 1.000

TOUGHNESS REQUIREMENTS: -20°C - Toughness Requirements as per ASME B31.3-18

WELDING OF LINE PIPE: As per CSA Z662-19

WELDING PROCEDURES: Construction Contractor to provide welding procedure specifications (WPS) for review and application review. WPS's should include potential for high carbon equivalent (CE > 0.40%) in the existing pipe.

COATING OF REPLACEMENT LINE PIPE: U/G Coating: Dual layer abrasion resistant fusion bonded epoxy (FBE/ARO). The coating shall meet the requirements applicable to System 2B of CSA Z245.20-18. Refer to Coating Specification 110904260AI-RPT0001.

COATING OF BENDS: Plant applied Two Part Liquid Epoxy (e.g., Canusa HBE-DX or SCP SP-2888). The coating shall meet the requirements applicable to System FC1/FC3 of CSA Z245.30-18. Application as per Coating Specification 110904260AI-RPT0001.

COATING OF FIELD WELDS: Field applied abrasion resistant Two-Part Liquid Epoxy (e.g., Canusa HBE-DX). The coating shall meet the requirements applicable to System FC1/FC3 of CSA Z245.30-18. Application as per Coating Specification 110904260AI-RPT0001.

COATING OF TIE-IN WELDS: Transition from Extruded Polyethylene to Two-Part Liquid Epoxy: CSA Z245.30-18 System FC7 Visco-Elastic Systems (e.g., Kema Series 60, Stopaq). The coating shall meet the requirements applicable to System FC7 of CSA Z245.30-18. Application as per Coating Specification 110904260AI-RPT0001.

D.1.4 PRESSURE TESTING

1. This section provides an overview of the hydrostatic pressure testing that consists of the strength test, leak test, pressure test plan, and pre-installation and post installation test.

2. The testing will be completed in accordance with Sun-Canadian best practices and will be the following acts, regulation, standards, and guidelines which apply to testing energy pipeline in Ontario:

    - CSA Z662-19 Oil and Gas Pipeline Systems
    - TSSA Oil and Gas Pipelines – Code Adoption Document (CAD) – February 2018
    - Ontario Regulation 210/01 (O. Reg. 210/01)
    - Code of Practice for the Temporary Diversion of Water for Hydrostatic Testing of Pipelines (January 1999)
    - Code of Practice for the Release of Hydrostatic Test Water from Hydrostatic Testing of Petroleum Liquid and Gas Pipelines (January 1999)
    - CAPP and CEPA Hydrotest Water Management Guidelines (September 1996)

3. The specifications for the pipeline are as follows:

    - Carbon steel material, Diameter: 323.9 mm (12.750 inch) x Wall Thickness: 12.7 mm and Grade: 448 MPa, Design Pressure: 9,930 kPa.
    - The specified minimum yield strength (SMYS) is 448 MPa (65,000 psi).

4. Strength Test

    - A strength test will be performed aboveground prior to pipe installation where the minimum pressure will be 12,413 kPag (9,930 kPag MOP × 1.25, per CSA Z662-19, Table 8.1and the maximum pressure will be 12,713 kPag. Testing will occur for one (1) hour (as per CSA Z662-19 Clause 8.7.5.2) for fully exposed new construction. The test pressure shall not exceed a pressure corresponding to 100% of the SMYS of the pipe.
    - A strength test will also be performed underground after pipe installation where the minimum pressure will be 12,413 kPag (9,930 kPag MOP × 1.25, per CSA Z662-19, Table 8.1 and the maximum pressure will be 12,913 kPag. Testing will be four (4) hours in duration (as per CSA Z662-19 Clause 8.7.5.1), including new construction pipe, bends, and transition spools.

5. Leak Test

- A leak test will be performed in the case of a test section that cannot be or is not visually inspected for leakage during the test (e.g., underground, etc.). Immediately following the strength hydro-test conducted aboveground prior to pipe installation, the pressure shall be reduced, and a visual inspection shall be conducted for leak detection. Duration is as required to conduct a complete Visual Inspection to detect leaks. Minimum Pressure of 10,923 kPag (9,930 kPag MOP × 1.10 as per CSA Z662-19 Clauses 8.2.5 and 8.7.1.2).
- A leak test will also be conducted following the strength hydro-test that is to be completed underground after pipe installation where the minimum pressure will be 10,923 kPag (9,930 kPag MOP × 1.10 as per CSA Z662-19 (Clauses 8.2.5 and 8.7.1.1) and maximum pressure will be 11,223 kPag. Testing will occur for a four (4) hour duration (as per CSA Z662-19 Clause 8.7.5.3), including new construction pipe, bends, and transition spools.

6. Test Segments

- The Project has one segment to be tested: East Sixteen Mile Creek Crossing – Approximately 480 meters of 323.9 mm OD (NPS 12) replacement pipe for the creek and road crossing (tie-in to tie-in).

7. Pressure Stages:

- Pressurizing of the test section shall be completed in accordance with all safety precautions outlined in the contractor's test procedure and this document. Filling of the test section to test pressure shall be conducted as follows:

    - 25% test pressure, hold for 10-15 minutes
    - 50% test pressure, hold for 10-15 minutes
    - 75% test pressure, hold for 10-15 minutes
    - 100% test pressure, hold for the duration of the strength test
    - Upon completion of the strength test the pressure shall be reduced to the pressure required for the leak test provided in the Hydrotest Pan Pipe Replacement Design of Sun-Canadian NPS 12 at Sixteen Mile Creek Crossing prepared by Stantec Consulting Ltd (2020).

8. Pre-Installation Test

- Prior to installation of the pipe string for the HDD or HD bores, a one (1) hour above ground pre-test will be conducted. The pipe strings will be visually inspected for leaks near the end of the test duration.
- After the pipe string has been successfully tested, it shall be dewatered and a minimum of 345 kPag (50 psig) of air pressure placed on the section. The pressure in the pipe string shall remain until the pipe string is installed and monitored daily.

9. Post Installation Test

- Once the pipe string has been pulled into the bore and the bends and transition pieces have been attached, a gauging pig survey shall be conducted. The gauging pig survey encompass:

  - A minimum of two gauging plates shall be run in each segment. Please note a single pig may have two plates attached.
  - The gauging plate shall be 95% of the nominal inside diameter.
  - A Sun-Canadian company representative must be onsite to witness.

- If the gauging pig survey is acceptable, the pipe can undergo the post installation hydrotest. For the post installation hydrotest, the strength and leak test durations of the post installation hydrotest shall be at least four hours each, after temperature stabilization is achieved, or extended as necessary to achieve a two-hour period where there is no pressure fluctuation except an acceptable correlation between pressure and temperature change. If pressure drops associated with temperature changes of the fluid cause the pressure at the high point to drop below the minimum strength test pressure plus 100 kPa (ex. 12,413 + 100 = 12,513 kPa), water shall be added to bring the pressure up to approximately minimum strength test pressure plus 300 kPa (12,713 kPa). If the pressure for any test section drops below the minimum strength test pressure, the test section shall be deemed unsuccessful and will be depressurized and retested with new pressure and temperature charts for the entire section. The cause of the pressure drop shall be located and repaired in accordance with the specifications prior to retest.

D.1.5 PROJECT COSTS (SECTION NOT APPLICABLE)

1. Sun-Canadian is a non-rate regulated entity, it is a private corporation, and the cost of the proposed Project will be borne by the Applicant.

D.1.6 SCHEDULE

1. The entire construction project will occur over a period ranging from 8 to 10 months (Planning, mobilization, execution, demobilization) through the Summer and Fall of 2022. Construction of the replacement pipeline segment is anticipated to take 30 to 45 days. Subject to receipt of all necessary permits and approvals, Sun-Canadian anticipates a proposed line in-service date in late Q3 2022.

2. The project milestones are summarized in Table D.1.6-1, and the construction schedule is shown in Table D.1.6-2. The operation and maintenance phase is predicted to be from 2022 to 2072.

Table D.1.6-1: Project Milestones

Project Phase	Anticipated Timeline
ER and technical design	2020 to 2021
Expected LTC approval	Q2 2022
Receipt of permits and approvals	Q2 2022
Commence construction	June 2022
Completion of construction	August 2022
Complete hydrostatic testing	September 2022
Final inspection	October 2022
Line in-service	Q3 2022
Operation and Maintenance	2022 to 2072

Table D.1.6-2: Project Construction Schedule

East Sixteen Mile Creek Pipeline Project Schedule	**2022**			
	June	**July**	**August**	**September**
Construction Phases				
Site Preparation and Clearing				
Grading and Stripping				
Stringing				
Pipe Fabrication				
Horizontal Directional Drilling (HDD)				
Backfilling				
Hydrostatic Testing				
Clean-Up and Restoration				