Canada Energy Regulator / Régie de l'énergie du Canada

Company: Example
Total ACE: $55,547,136

Part A - Calculation of ACE for Pipelines and Above-Ground Facilities that are Operational and Decommissioned

Legend: a = assessment in place; R = removed; AI = assessment in place with special treatment

Step 1 - Categorization of company's pipelines by land use and determination of the assumed lengths of pipeline to be abandoned in place and removed for purposes of calculating the ACE

Land Use: Agricultural/Cropland

Commodity Type	Pipeline Diameter Category	Total Actual Pipeline Length (km)	Base Case 2021 Abandonment Method (% Assumed to be Abandoned in Place)		Pipeline Length Assumed to be Abandoned in Place (km)	Pipeline Length Assumed to be Removed (km)
			a	R		
oil	very small (not steel)	0.000	95	5	0.000	0.000
	very small (steel)	0.000	95	5	0.000	0.000
	small	0.000	95	5	0.000	0.000
	medium	0.000	80	20	0.000	0.000
	large	0.000	80	20	0.000	0.000
	Sub total	**0.000**			**0.000**	**0.000**
gas	very small (not steel)	0.000	95	5	0.000	0.000
	very small (steel)	0.000	95	5	0.000	0.000
	small	0.000	95	5	0.000	0.000
	medium	259.574	80	20	191.980	47.995
	large	502.535	80	20	371.884	92.971
	Sub total	**762.109**			**563.864**	**140.966**
other commodity	very small (not steel)	0.000	95	5	0.000	0.000
	very small (steel)	0.000	95	5	0.000	0.000
	small	0.000	95	5	0.000	0.000
	medium	0.000	80	20	0.000	0.000
	large	0.000	80	20	0.000	0.000
	Sub total	**0.000**			**0.000**	**0.000**
Total		**762.109**			**563.864**	**140.966**

Land Use: Grasslands and Shrublands

Commodity Type	Pipeline Diameter Category	Total Actual Pipeline Length (km)	Base Case 2021 Abandonment Method (% Assumed to be Abandoned in Place)		Pipeline Length Assumed to be Abandoned in Place (km)	Pipeline Length Assumed to be Removed (km)
			a	R		
oil	very small (not steel)	0.000	95	5	0.000	0.000
	very small (steel)	0.000	95	5	0.000	0.000
	small	0.000	95	5	0.000	0.000
	medium	0.000	80	20	0.000	0.000
	large	0.000	80	20	0.000	0.000
	Sub total	**0.000**			**0.000**	**0.000**
gas	very small (not steel)	0.000	95	5	0.000	0.000
	very small (steel)	0.000	95	5	0.000	0.000
	small	0.000	95	5	0.000	0.000
	medium	6.775	80	20	5.004	1.251
	large	215.915	80	20	159.534	39.884
	Sub total	**222.690**			**164.538**	**41.134**
other commodity	very small (not steel)	0.000	95	5	0.000	0.000
	very small (steel)	0.000	95	5	0.000	0.000
	small	0.000	95	5	0.000	0.000
	medium	0.000	80	20	0.000	0.000
	large	0.000	80	20	0.000	0.000
	Sub total	**0.000**			**0.000**	**0.000**
Total		**222.690**			**164.538**	**41.134**

Land Use: Forested Lands

Commodity Type	Pipeline Diameter Category	Total Actual Pipeline Length (km)	Base Case 2021 Abandonment Method (% Assumed to be Abandoned in Place)		Pipeline Length Assumed to be Abandoned in Place (km)	Pipeline Length Assumed to be Removed (km)
			a	R		
oil	very small (not steel)	0.000	95	5	0.000	0.000
	very small (steel)	0.000	95	5	0.000	0.000
	small	0.000	95	5	0.000	0.000
	medium	0.000	80	20	0.000	0.000
	large	0.000	80	20	0.000	0.000
	Sub total	**0.000**			**0.000**	**0.000**
gas	very small (not steel)	0.000	95	5	0.000	0.000
	very small (steel)	0.000	95	5	0.000	0.000
	small	0.000	95	5	0.000	0.000
	medium	9.718	80	20	7.175	1.794
	large	2.975	80	20	2.197	0.549
	Sub total	**12.693**			**9.372**	**2.343**
other commodity	very small (not steel)	0.000	95	5	0.000	0.000
	very small (steel)	0.000	95	5	0.000	0.000
	small	0.000	95	5	0.000	0.000
	medium	0.000	80	20	0.000	0.000
	large	0.000	80	20	0.000	0.000
	Sub total	**0.000**			**0.000**	**0.000**
Total		**12.693**			**9.372**	**2.343**

Land Use: Wetlands - Water

Commodity Type	Pipeline Diameter Category	Total Actual Pipeline Length (km)	Base Case 2021 Abandonment Method (% Assumed to be Abandoned in Place)		Pipeline Length Assumed to be Abandoned in Place (km)	Pipeline Length Assumed to be Removed (km)
			a	R		
oil	very small (not steel)	0.000	95	5	0.000	0.000
	very small (steel)	0.000	95	5	0.000	0.000
	small	0.000	95	5	0.000	0.000
	medium	0.000	80	20	0.000	0.000
	large	0.000	80	20	0.000	0.000
	Sub total	**0.000**			**0.000**	**0.000**
gas	very small (not steel)	0.000	95	5	0.000	0.000
	very small (steel)	0.000	95	5	0.000	0.000
	small	0.000	95	5	0.000	0.000
	medium	0.000	80	20	0.000	0.000
	large	35.128	80	20	33.171	8.292
	Sub total	**35.128**			**33.171**	**8.292**
other commodity	very small (not steel)	0.000	95	5	0.000	0.000
	very small (steel)	0.000	95	5	0.000	0.000
	small	0.176	95	5	0.019	0.010
	medium	0.000	80	20	0.000	0.000
	large	0.000	80	20	0.000	0.000
	Sub total	**0.176**			**0.019**	**0.010**
Total		**35.304**			**33.189**	**8.302**

Land Use: Existing Developed Lands

Commodity Type	Pipeline Diameter Category	Total Actual Pipeline Length (km)	Base Case 2021 Abandonment Method (% Assumed to be Abandoned in Place)		Pipeline Length Assumed to be Abandoned in Place (km)	Pipeline Length Assumed to be Removed (km)
			a	R		
oil	very small (not steel)	0.000	80	20	0.000	0.000
	very small (steel)	0.000	80	20	0.000	0.000
	small	0.000	80	20	0.000	0.000
	medium	0.000	80	20	0.000	0.000
	large	0.000	80	20	0.000	0.000
	Sub total	**0.000**			**0.000**	**0.000**
gas	very small (not steel)	0.000	80	20	0.000	0.000
	very small (steel)	0.000	80	20	0.000	0.000
	small	0.000	80	20	0.000	0.000
	medium	1.347	80	20	1.077	0.269
	large	0.000	80	20	0.000	0.000
	Sub total	**1.347**			**1.077**	**0.269**
other commodity	very small (not steel)	0.000	80	20	0.000	0.000
	very small (steel)	0.000	80	20	0.000	0.000
	small	0.000	80	20	0.000	0.000
	medium	0.000	80	20	0.000	0.000
	large	0.000	80	20	0.000	0.000
	Sub total	**0.000**			**0.000**	**0.000**
Total		**1.347**			**1.077**	**0.269**

Totals	Total Length of Pipeline System (km)			Total Assumed Pipeline Length to be Abandoned in Place (km)	Total Assumed Pipeline Length to be Removed (km)
	1047.718			836.150	192.912

Step 2 - Total number of crossings by crossing type and determination of the assumed number of crossings that will be abandoned in place with special treatment for the purposes of calculating the ACE

Crossing Type: Water Crossings

Pipeline Diameter Category	Total Number of Crossings (#)	Special Treatment Assumption (% a+a)		Number of Crossings Assumed to have Special Treatment Applied (#)
		a+	a	
very small (not steel)	0	0	100	0.00
very small (steel)	0	0	100	0.00
small	2	5	95	2.10
medium	175	5	95	8.75
large	461	5	95	23.05
Total	**638**			**33.90**

Crossing Type: Paved Road Crossings

Pipeline Diameter Category	Total Number of Crossings (#)	Special Treatment Assumption (% a+a)		Number of Crossings Assumed to have Special Treatment Applied (#)
		a+	a	
very small (not steel)	0	0	100	0.00
very small (steel)	0	0	100	0.00
small	0	0	100	0.00
medium	14	100	0	14.00
large	0	100	0	0.00
Total	**14**			**14.00**

Crossing Type: Unpaved Road Crossings

Pipeline Diameter Category	Total Number of Crossings (#)	Special Treatment Assumption (% a+a)		Number of Crossings Assumed to have Special Treatment Applied (#)
		a+	a	
very small (not steel)	0	0	100	0.00
very small (steel)	0	0	100	0.00
small	0	0	100	0.00
medium	72	50	50	36.00
large	180	50	50	90.00
Total	**252**			**126.00**

Crossing Type: Railway Crossings

Pipeline Diameter Category	Total Number of Crossings (#)	Special Treatment Assumption (% a+a)		Number of Crossings Assumed to have Special Treatment Applied (#)
		a+	a	
very small (not steel)	0	0	100	0.00
very small (steel)	0	0	100	0.00
small	0	100	0	0.00
medium	13	100	0	13.00
large	0	100	0	0.00
Total	**13**			**13.00**

Step 3 - Calculation of Pipeline Abandonment Activity Costs

Cost Categories		Cost Calculations by Pipeline Diameter Category										
		small			medium			large				Total Cost ($)
		Base Case 2021 Unit Cost ($/km)	Assorted Pipeline Length (km) or Number of Crossings (#) as applicable	Subtotal ($)	Base Case 2021 Unit Cost ($/km)	Assorted Pipeline Length (km) or Number of Crossings (#) as applicable	Subtotal ($)	Base Case 2021 Unit Cost ($/km)	Assorted Pipeline Length (km) or Number of Crossings (#) as applicable	Subtotal ($)		
Land Access and Clearup		34,000	0.000	-	34,000	201.753	21,062,070	26,000	701.486	32,925,945	54,028,172	
Pipeline Purging and Cleaning	oil	34,000	0.000	-	17,000	0.000	-	10,000	0.000	-	-	
	gas	34,000	0.000	-	17,000	201.753	11,840,188	10,000	701.486	12,014,860	23,855,048	
	other commodity	34,000	0.000	-	17,000	0.000	-	10,000	0.000	-	-	
Pipeline Abandonment in Place		180,000	0.000	-	117,000	201.753	23,614,140	105,000	701.486	73,656,300	103,270,440	
Pipeline Removal	oil	150,000	0.000	-	150,000	0.000	-	150,000	0.000	-	-	
	gas	150,000	0.000	-	150,000	140.984	21,147,600	150,000	0.000	-	21,147,600	
	other commodity	150,000	0.000	-	150,000	0.000	-	150,000	0.000	-	-	
Reclamation and Restoration	oil	50,000	0.000	-	50,000	201.753	10,087,650	75,000	701.486	52,611,450	62,699,100	
	gas	50,000	0.000	-	50,000	201.753	10,087,650	75,000	701.486	52,611,450	62,699,100	
	other commodity	50,000	0.000	-	50,000	0.000	-	75,000	0.000	-	-	
Cleanup	road crossings	125,000	0.000	-	125,000	0.000	-	175,000	0.000	-	-	
	railway crossings	125,000	0.000	-	125,000	13.000	1,625,000	175,000	0.000	-	1,625,000	
Total				**0.00**		**1,006,765**	**[illegible]**		**2,104,457**	**[illegible]**	**[illegible]**	

Step 4 - Calculation of above-ground facility abandonment activity costs

Cost categories:	Above-ground facility type:	Base Case 2021 Unit Cost ($/site)	Number of Facility Sites (#)	Total Cost ($)
Above-Ground Facility Removal	Value with above-ground appurtenances	350,000	17	5,950,000
	Meter station	100,000	19	19,800,000
	Compressor station	1,000,000	4	4,000,000
	Pump station	250,000	0	0
	Oil terminal & storage facilities	1,000,000	0	0
	Processing plant	500,000	0	0
	Other - Rural	125,000	0	0
	Sub total			29,750,000
Above-Ground Facility Remediation	Value with above-ground appurtenances	112,500	17	1,912,500
	Meter station	380,000	19	7,220,000
	Compressor station	640,000	4	12,400,000
	Pump station	160,000	0	0
	Oil terminal & storage facilities	640,000	0	0
	Processing plant	320,000	0	0
	Other - Rural	8,000	0	0
	Sub total			21,832,500
Above-Ground Facility Reclamation and Restoration	Value with above-ground appurtenances	112,500	17	1,912,500
	Meter station	126,000	19	2,394,000
	Compressor station	640,000	4	12,400,000
	Pump station	175,000	0	0
	Oil terminal & storage facilities	320,000	0	0
	Processing plant	320,000	0	0
	Other - Rural	25,000	0	0
	Sub total			17,712,000
Total				**[illegible]**

Step 5 - Calculation of Engineering and Project Management and Contingency costs

Cost Categories		Base Case 2021 Percentage (%)	Sum of the total abandonment activity costs assessed in Steps 3 and 4	Total Cost ($)
Engineering and Project Management	for pipeline systems > 50 km in length	15	[illegible]	[illegible]
	for pipeline systems 50 - 50 km in length	20		
	for pipeline systems < 50 km in length	25		
Contingency	for pipeline systems > 50 km in length	15		
CA of Overall Engineering and Project Management Costs Allocated to Engagement Activities with Indigenous Peoples				[illegible]
CA of Overall Engineering and Project Management Costs Allocated to Engagement Activities with Landowners and other stakeholders				[illegible]

Step 6 - Calculation of Provisions for Abandoned Pipelines

Monitoring Provision	Cost calculations by pipeline diameter category																								
	small									medium										large					
	Base Case 2021 Costs and Assumptions									Base Case 2021 Costs and Assumptions										Base Case 2021 Costs and Assumptions					
	Annual cost of administrative activities and signage maintenance ($/km)	Cost of a single monitoring patrol ($/km)	Assumed number of monitoring patrols per year	Annuity factor applied	Length of pipeline abandoned in place (km)	Sub-total Administrative activities and signage maintenance ($)	Sub-total Monitoring patrols ($)	Sub-total ($)		Annual cost of administrative activities and signage maintenance ($/km)	Cost of a single monitoring patrol ($/km)	Assumed number of monitoring patrols per year	Annuity factor applied	Length of pipeline abandoned in place (km)	Sub-total Administrative activities and signage maintenance ($)	Sub-total Monitoring patrols ($)	Sub-total ($)		Annual cost of administrative activities and signage maintenance ($/km)	Cost of a single monitoring patrol ($/km)	Assumed number of monitoring patrols per year	Annuity factor applied	Length of pipeline abandoned in place (km)	Sub-total Administrative activities and signage maintenance ($)	Sub-total Monitoring patrols ($)	Sub-total ($)	Total Cost ($)
	1400	30	4	90	9.180	334,764	30	**334,794**		1400	3150	5	80	211.950	26,552,391	26,552,391	**53,104,781**		1400	3150	5	80	611.400	153,426,872	153,426,872	306,853,744	**359,985,296**

Unforeseen Event Provision	Cost calculations by pipeline diameter category																								
	small									medium										large					
	Base Case 2021 Costs and Assumptions									Base Case 2021 Costs and Assumptions										Base Case 2021 Costs and Assumptions					
	Cost to address an unforeseen event ($/event)	Assumed Number of Unforeseen Events per year per 100 km	Annuity factor applied	Length of pipeline assumed to be abandoned in place (km)	Sub-total ($)	Cost to address an unforeseen event ($/event)	Assumed Number of Unforeseen Events per year per 100 km	Annuity factor applied	Length of Pipeline Assumed to be Abandoned in Place (km)	Sub-total ($)	Cost to address an unforeseen event ($/event)	Assumed Number of Unforeseen Events per year per 100 km	Annuity factor applied	Length of pipeline assumed to be abandoned in place (km)	Sub-total ($)		Total Cost ($)
	250,000	0.1	80	9.180	312,268	375,000	0.1	80	211.950	11,737,198	2125,000	0.7	80	611.400	58,144,118		**[illegible]**

Part B - Calculation of ACE for already abandoned pipelines

Step 1 - Calculation of Provisions for Abandoned Pipelines

Monitoring Provision	Cost calculations by pipeline diameter category: very small (steel)								
	Base Case 2021 Costs and Assumptions								
	Annual cost of administrative activities and signage maintenance ($/km)	Cost of a single monitoring patrol ($/km)	Assumed number of monitoring patrols	Annuity factor applied	Length of pipeline abandoned in place (km)	Sub-total Administrative activities and signage maintenance ($)	Sub-total Monitoring patrols ($)	Sub-total ($)	Total Cost ($)
	1400	30	4	90	1.100	3411.25	30	**3441.25**	**3441.25**

Unforeseen Event	Cost calculations by pipeline diameter category: very small (steel)					
	Base Case 2021 Costs and Assumptions					
	Cost to Address Single Event ($/event)	Assumed Number of Unforeseen Events per year per 100 km	Annuity factor applied	Length of pipeline abandoned in place (km)	Sub-total ($)	Total Cost ($)
	36,000	0.1	80	1.100	31,417	**31,417**

Note - values in ACE tables may not sum due to rounding