

**Appendix I – Calculated Electric and
Magnetic Fields, Audible Noise Levels,
and Radio Noise Levels**

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APPENDIX I – CALCULATED ELECTRIC AND MAGNETIC FIELDS, AUDIBLE NOISE LEVELS, AND RADIO NOISE LEVELS

Appendix J contains diagrams (Figures I-1 through I-21) and tables (Tables I-1 through I-4) referenced in Chapter 3, Section 3.8, Public Health and Safety. Diagrams illustrate calculated profiles for electric and magnetic fields, audible noise, and radio noise modeled for five locations (modeled cross-sections 1 to 5). The diagrams represent the existing and proposed transmission line configurations on the alternative routes analyzed in this document. Tables I-1 to I-5 identify calculated magnetic field values for average- and peak-load conditions, electric field values, and audible noise for the modeled cross sections.

I.1 Magnetic Field Profiles

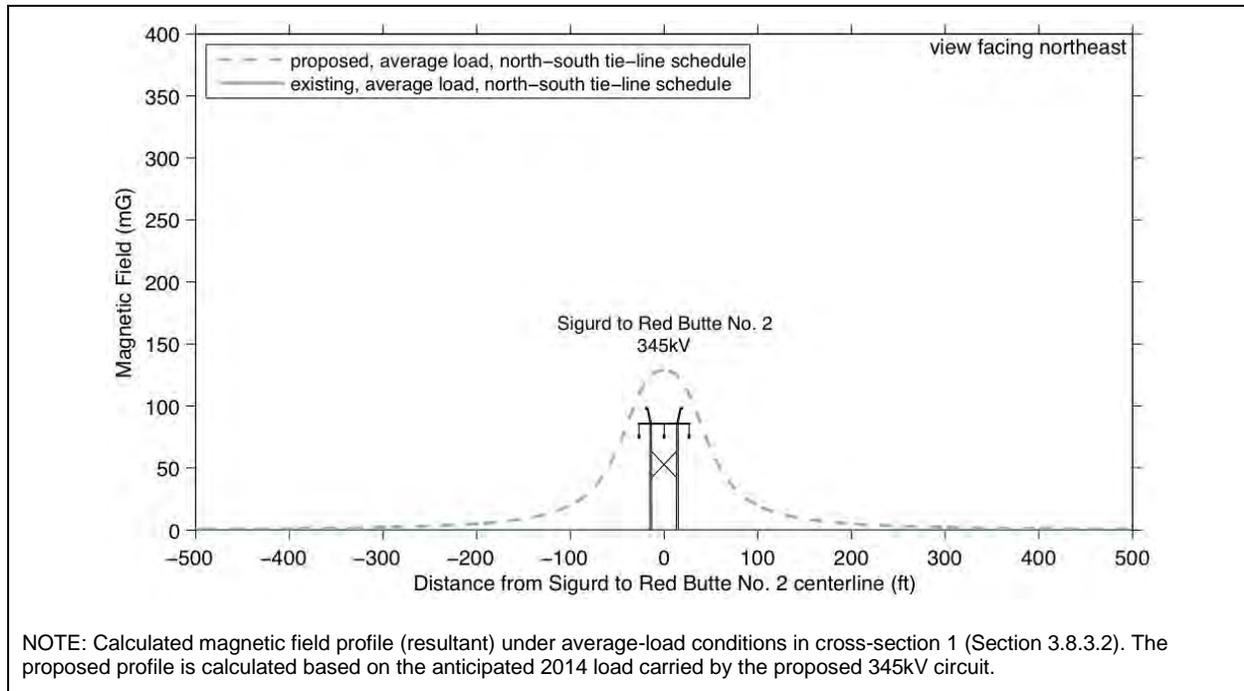


Figure I-1 Calculated Magnetic Field, Average Load in Cross-section 1

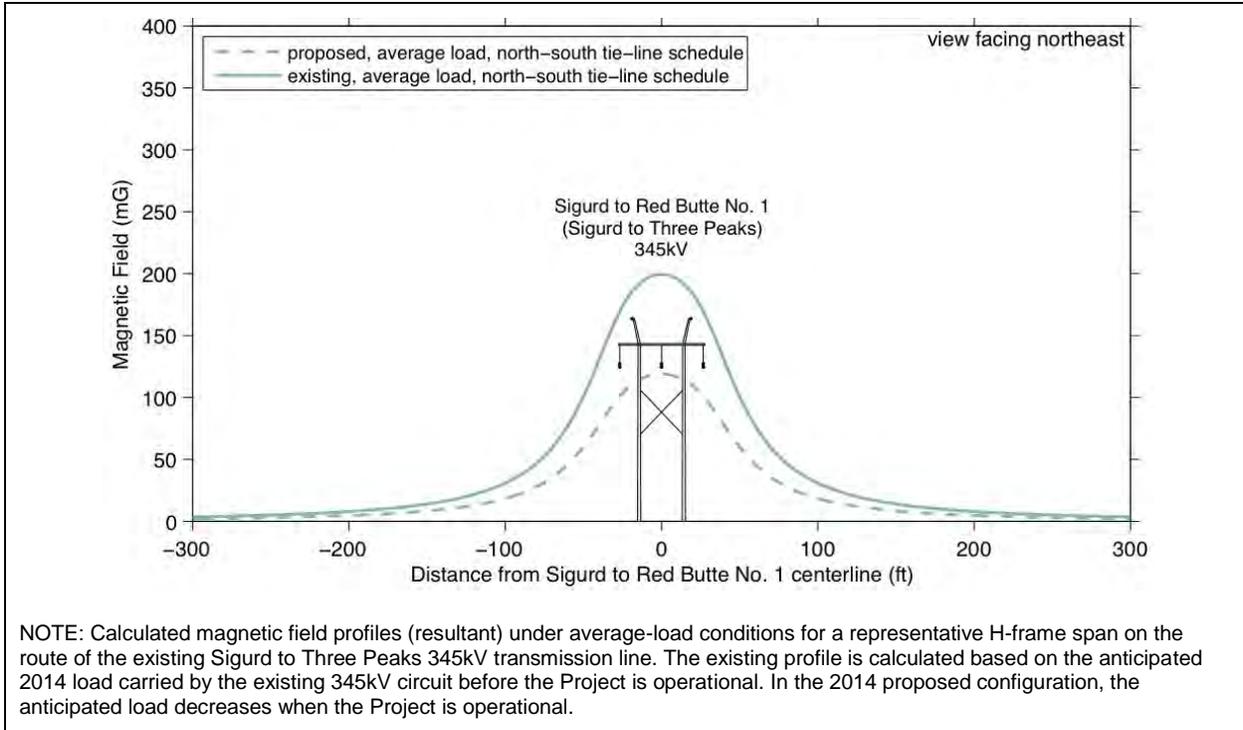


Figure I-2 Calculated Magnetic Field, Average Load for Existing Sigurd to Three Peaks 345kV Line

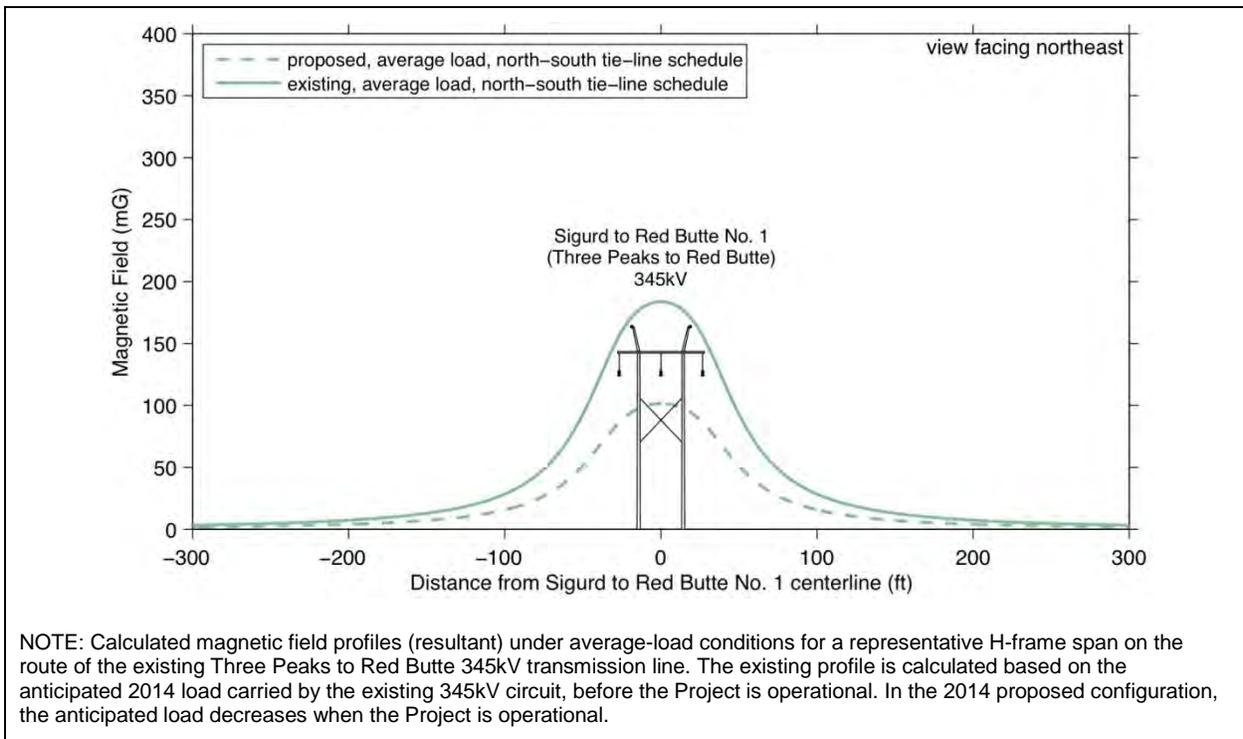


Figure I-3 Calculated Magnetic Field, Average Load for Existing Three Peaks to Red Butte 345kV Line

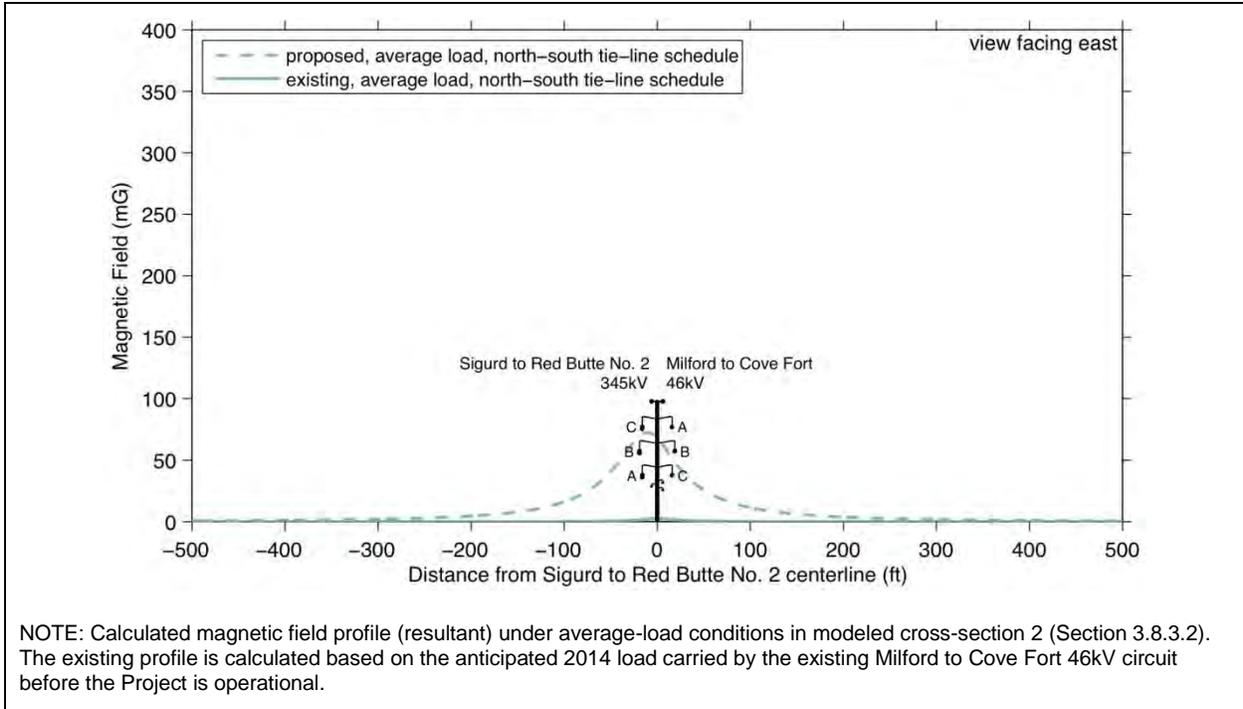


Figure I-4 Calculated Magnetic Field, Average Load in Cross-section 2

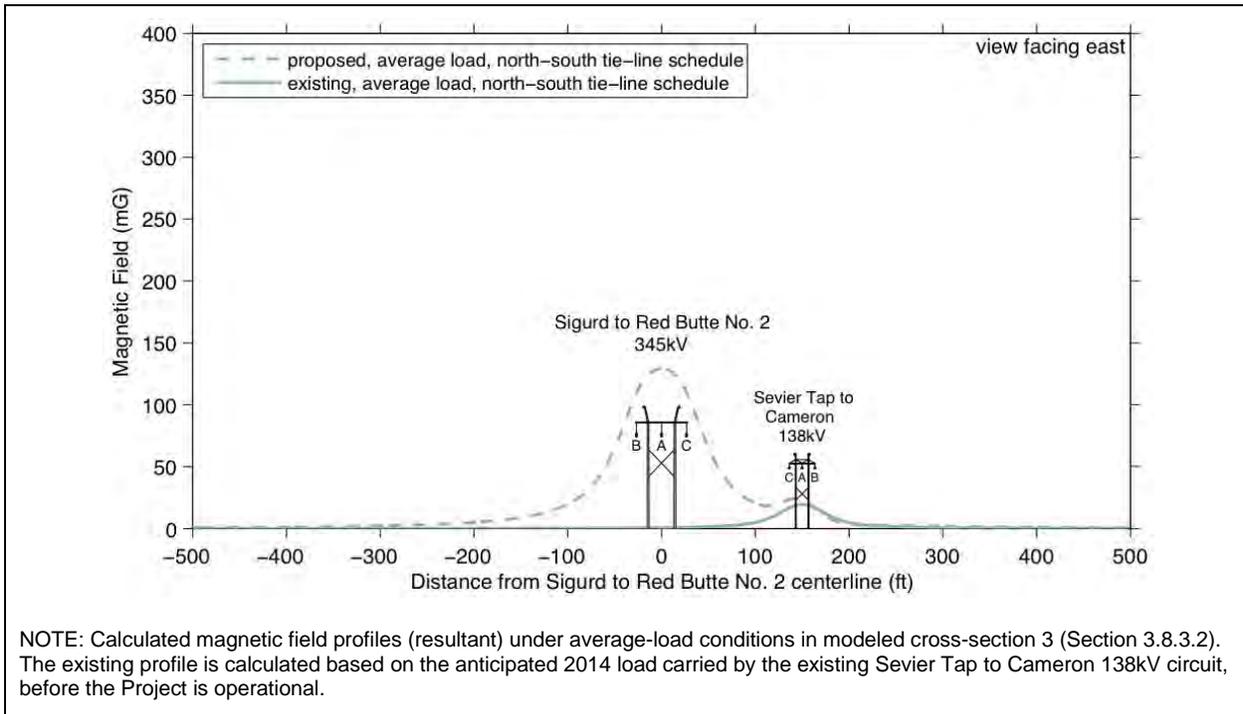


Figure I-5 Calculated Magnetic Field, Average Load in Cross-Section 3

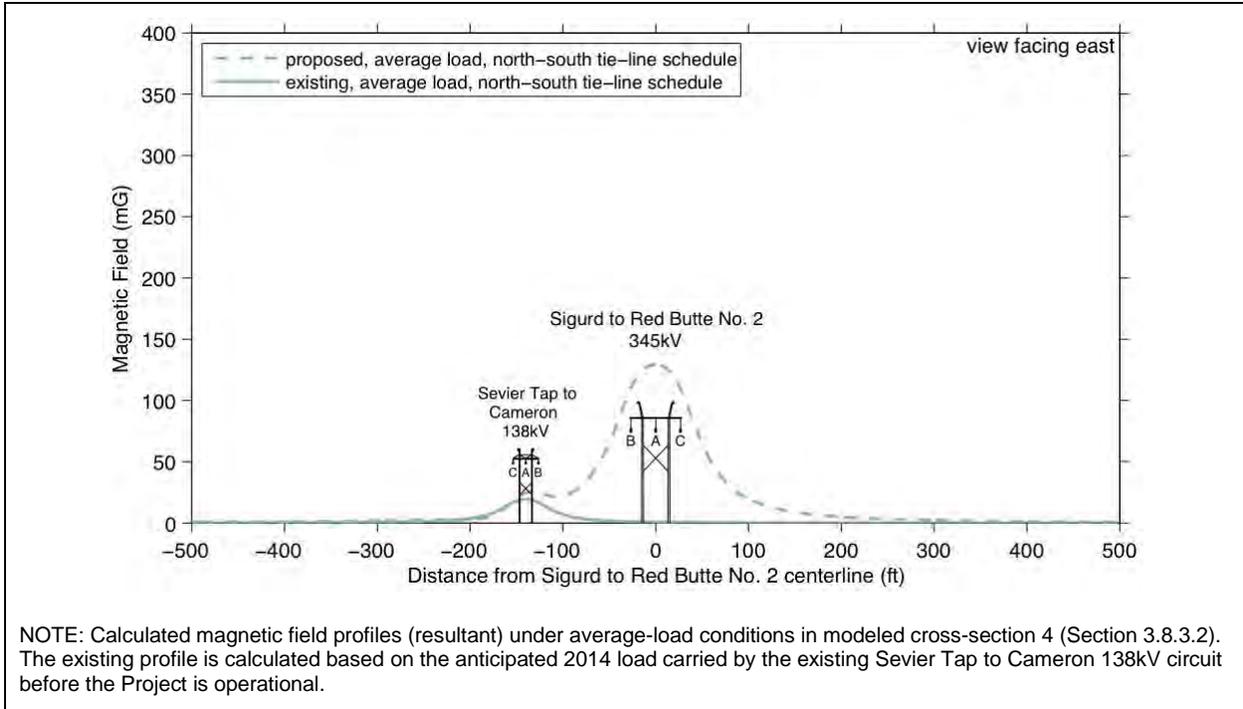


Figure I-6 Calculated Magnetic Field, Average Load in Cross-section 4

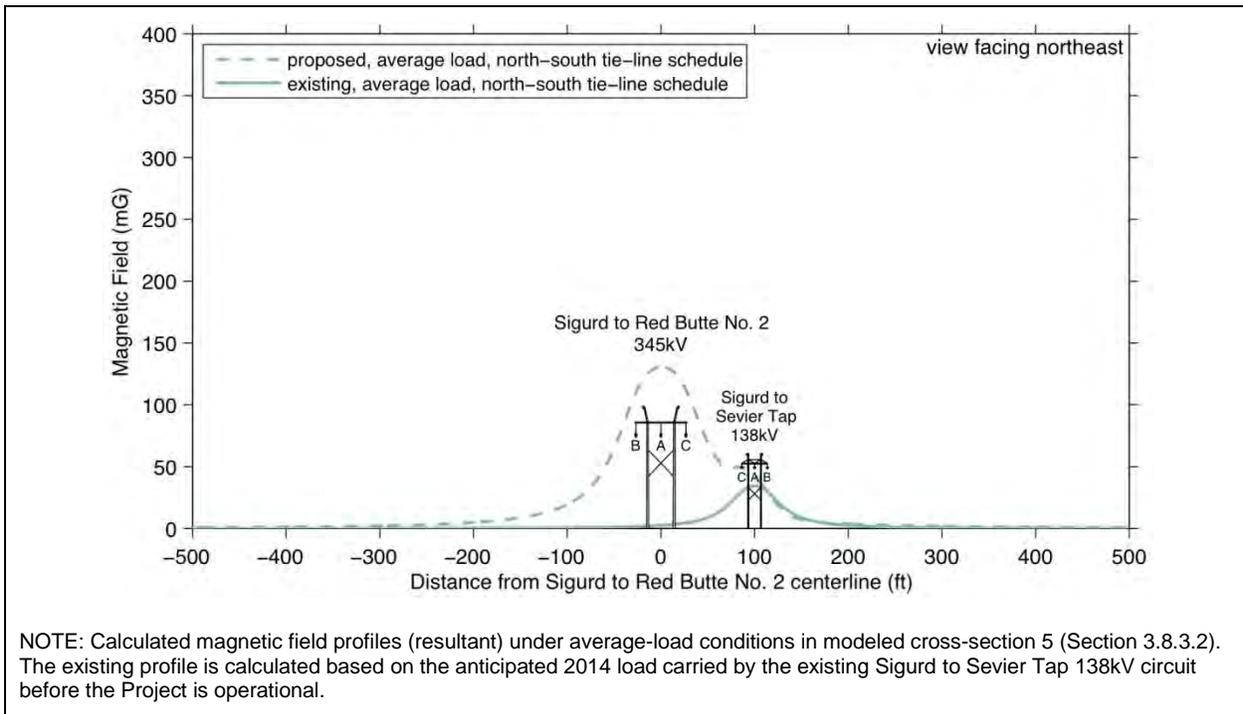


Figure I-7 Calculated Magnetic Field, Average Load in Cross-section 5

I.2 Electric Field Profiles

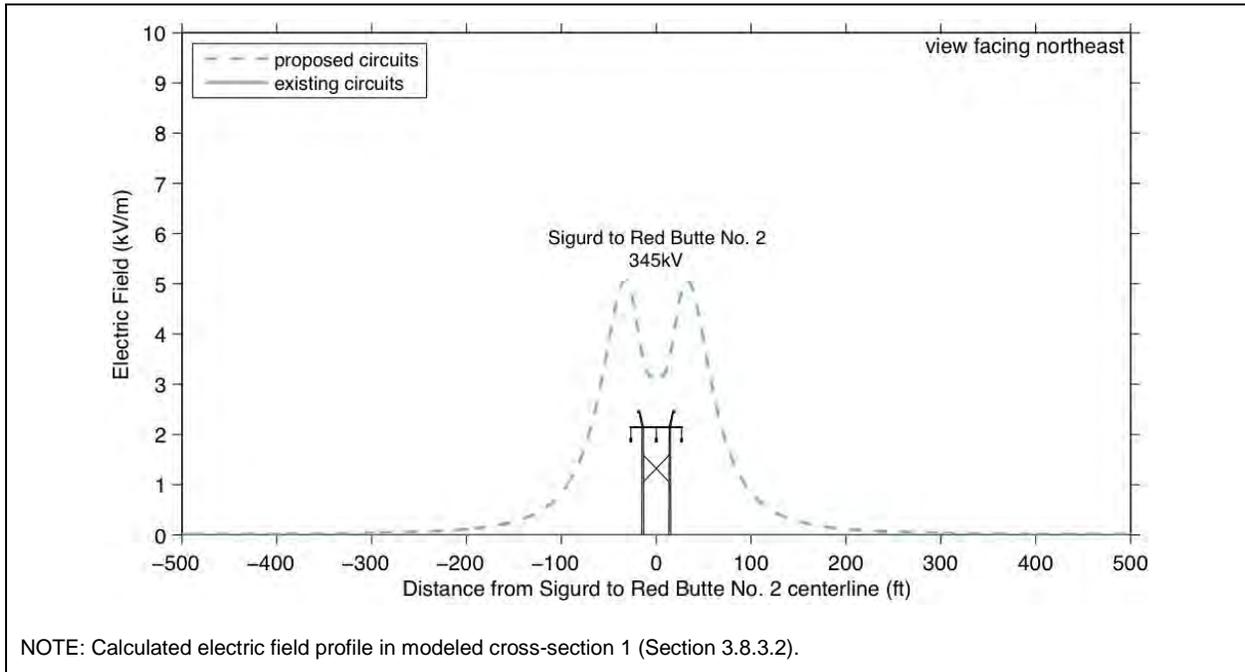


Figure I-8 Calculated Electric Field in Cross-section 1

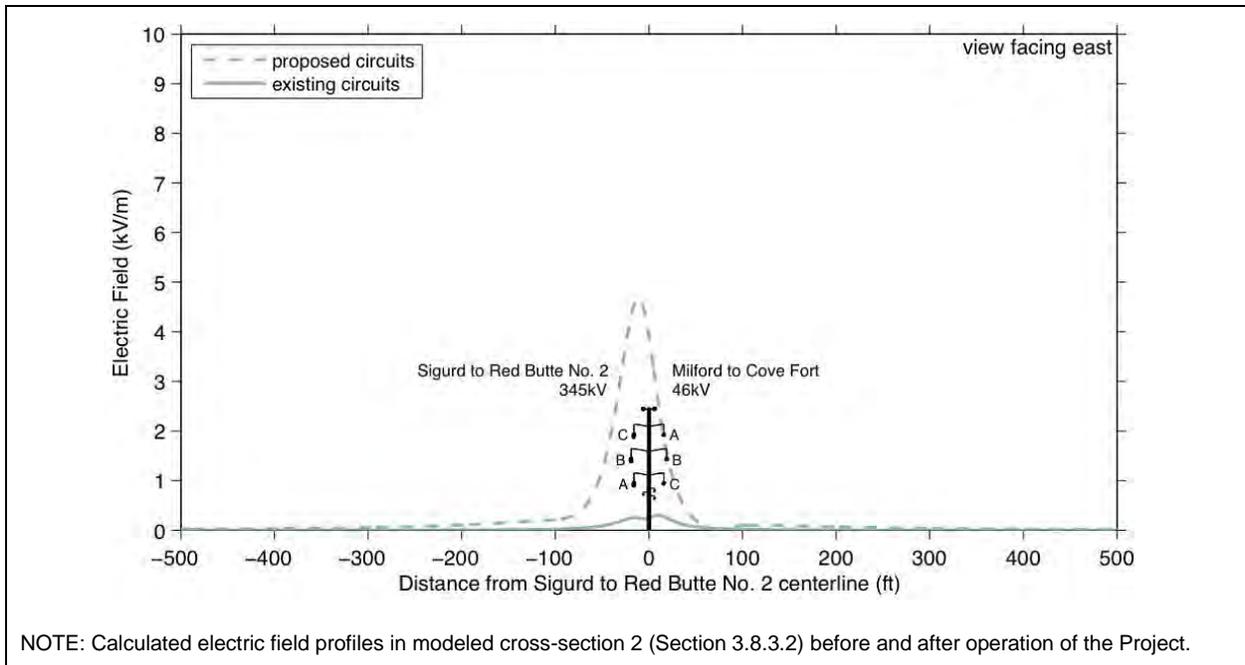


Figure I-9 Calculated Electric Field in Cross-section 2

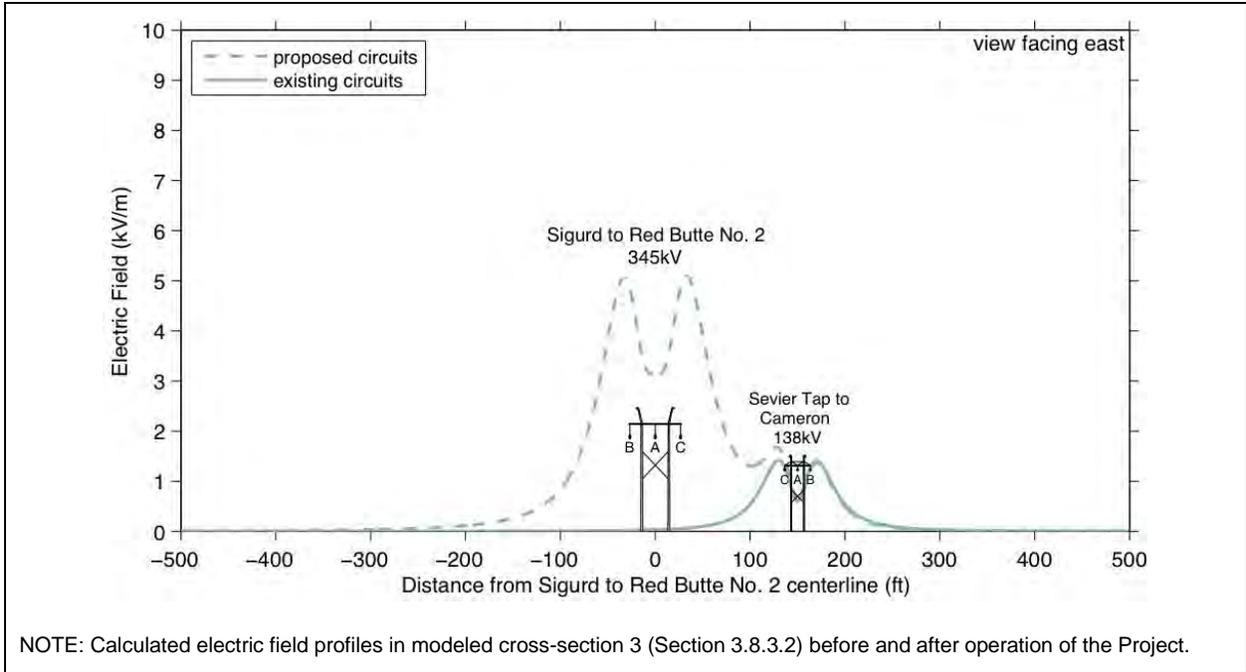


Figure I-10 Calculated Electric Field in Cross-section 3

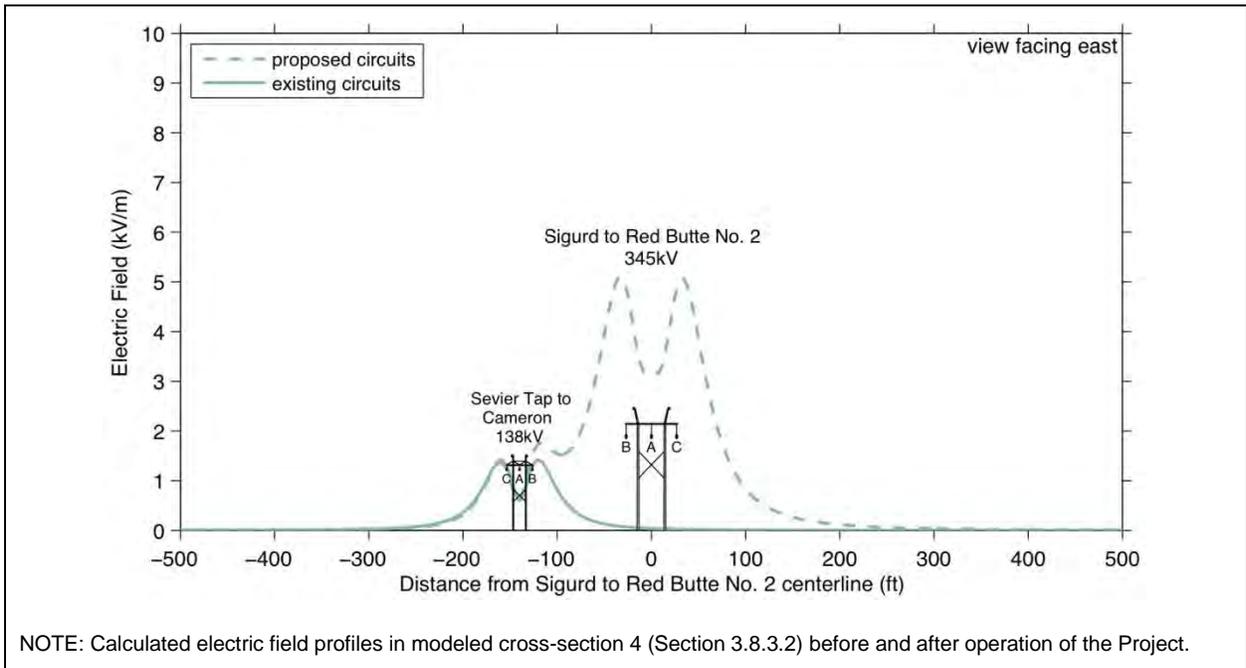


Figure I-11 Calculated Electric Field in Cross-section 4

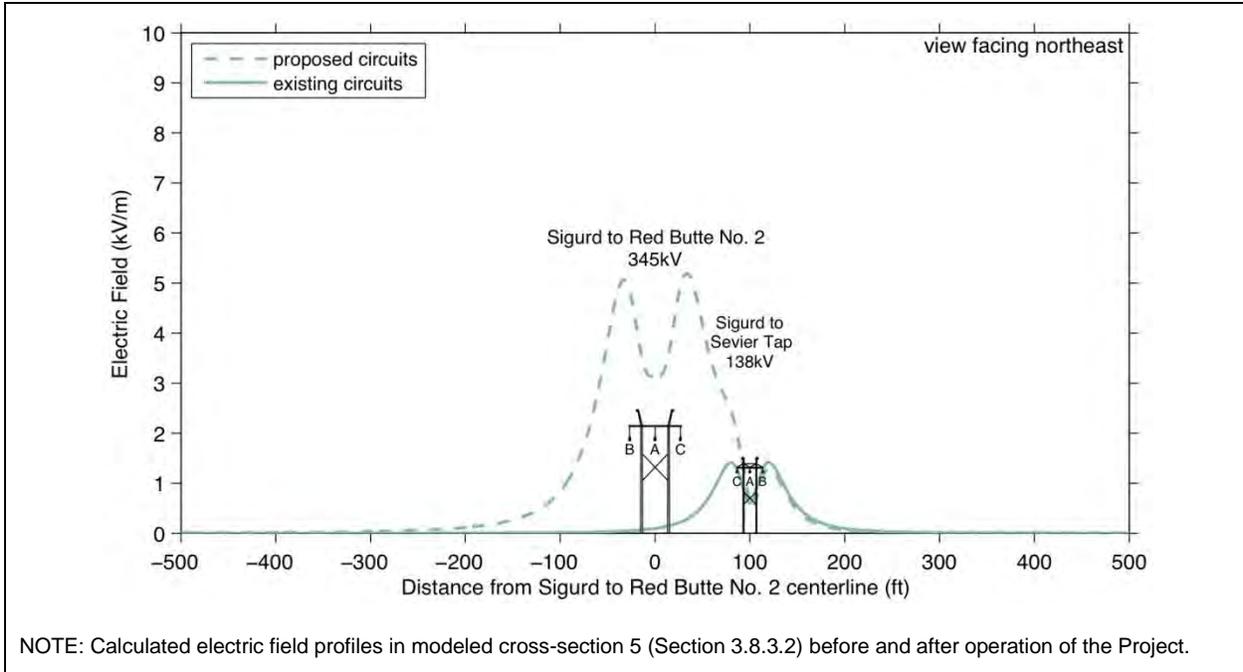


Figure I-12 Calculated Electric Field in Cross-section 5

I.3 Audible Noise Profiles

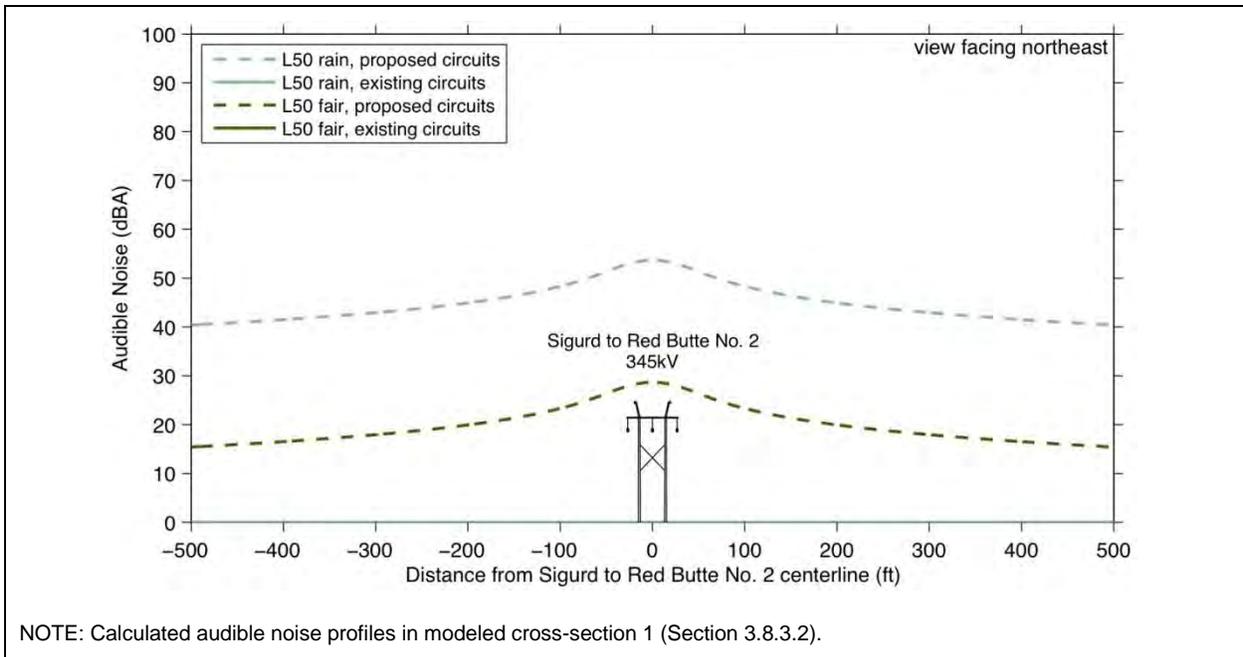


Figure I-13 Calculated Audible Noise in Cross-section 1

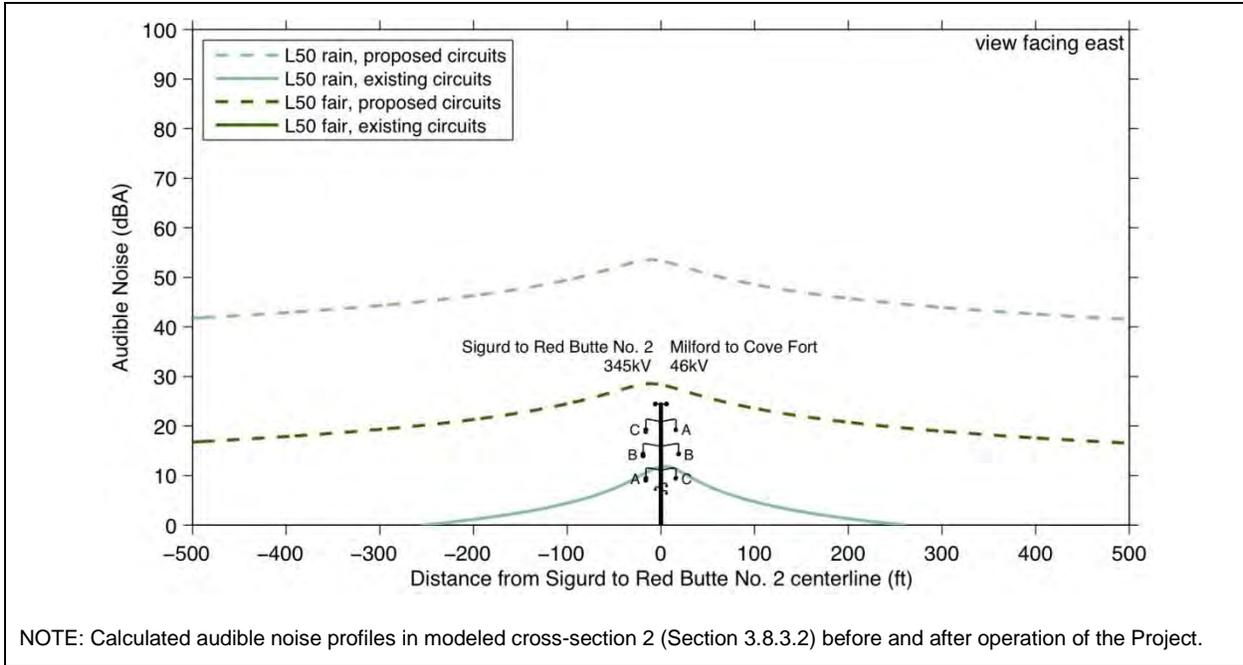


Figure I-14 Calculated Audible Noise in Cross-section 2

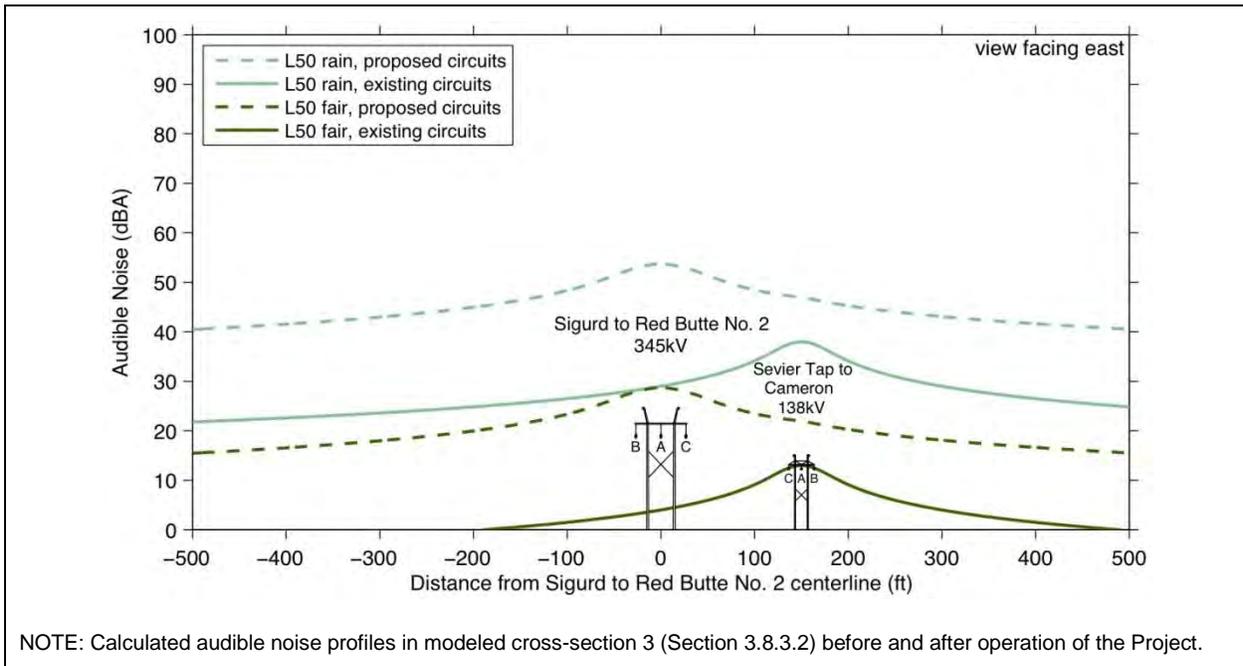


Figure I-15 Calculated Audible Noise in Cross-section 3

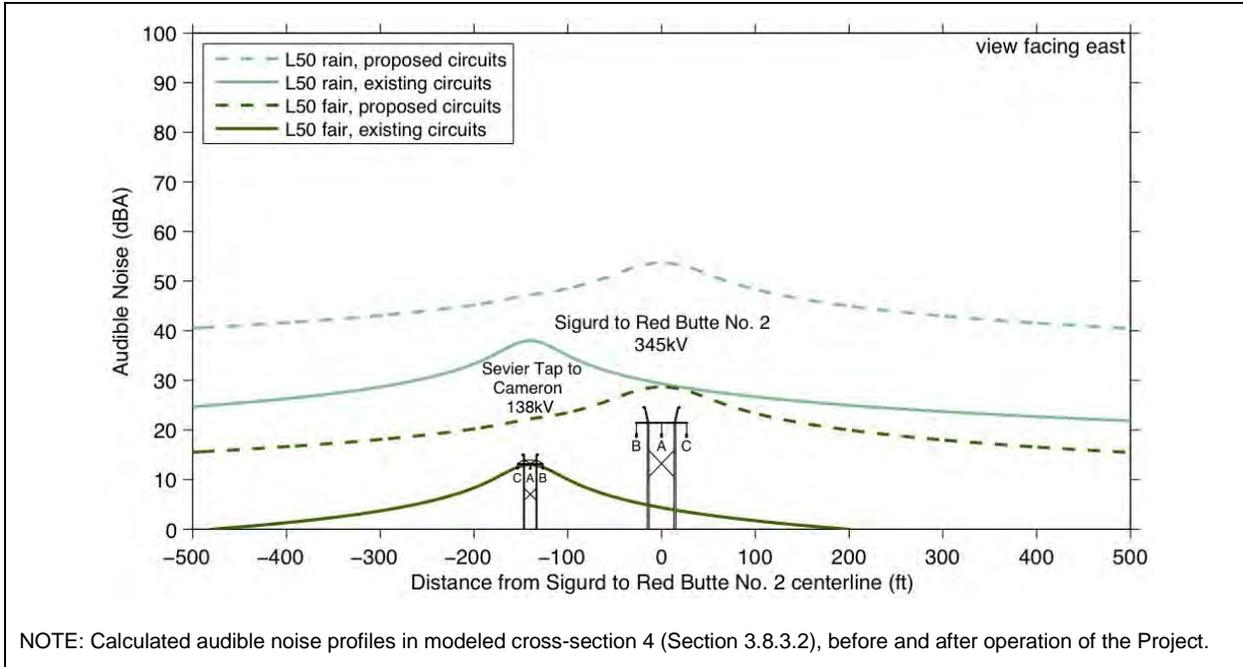


Figure I-16 Calculated Audible Noise in Cross-section 4

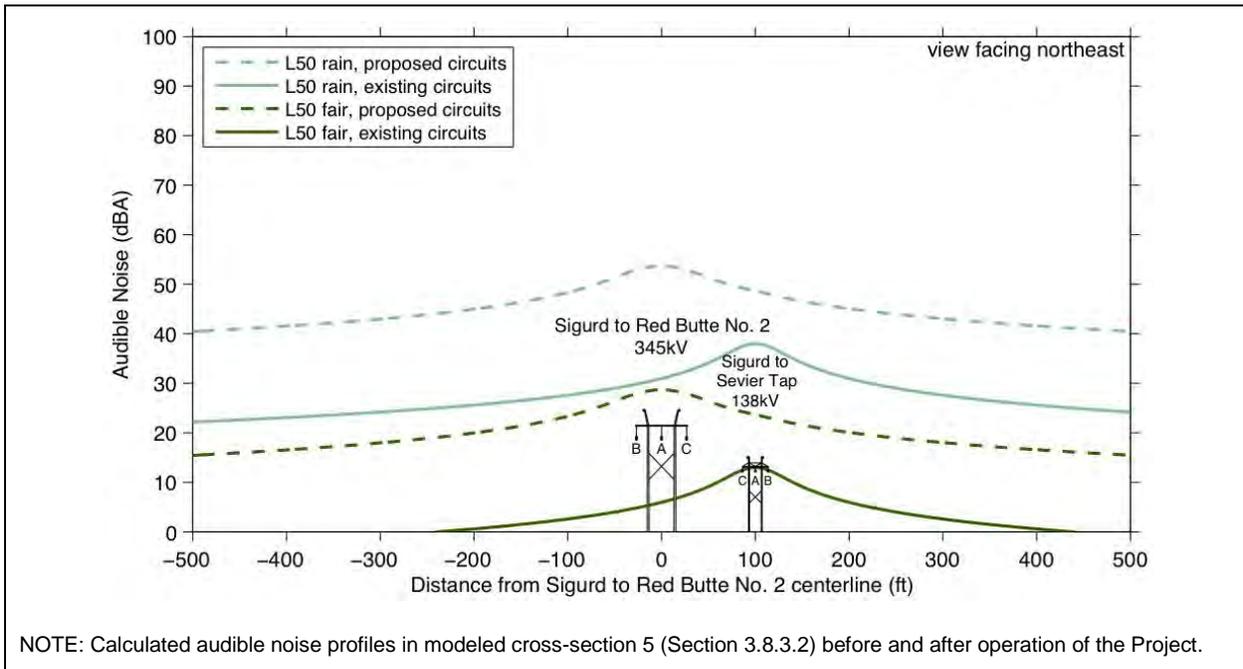


Figure I-17 Calculated Audible Noise in Cross-section 5

I.4 Radio Noise Profiles

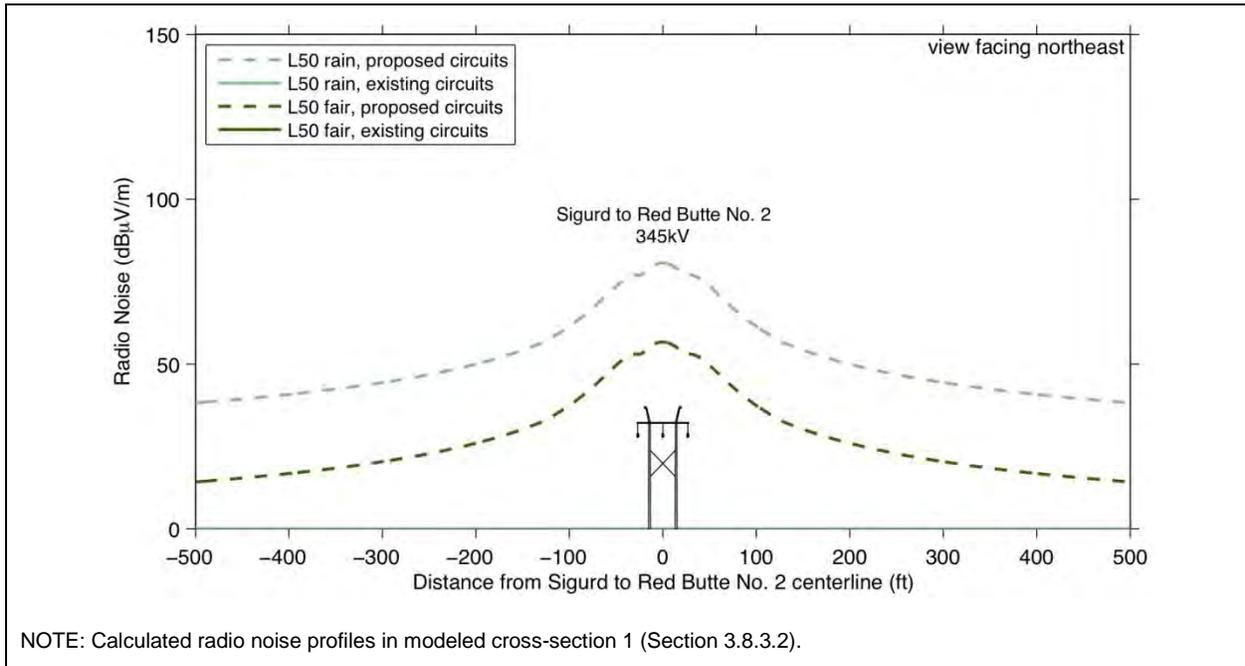


Figure I-18 Calculated Radio Noise in Cross-section 1

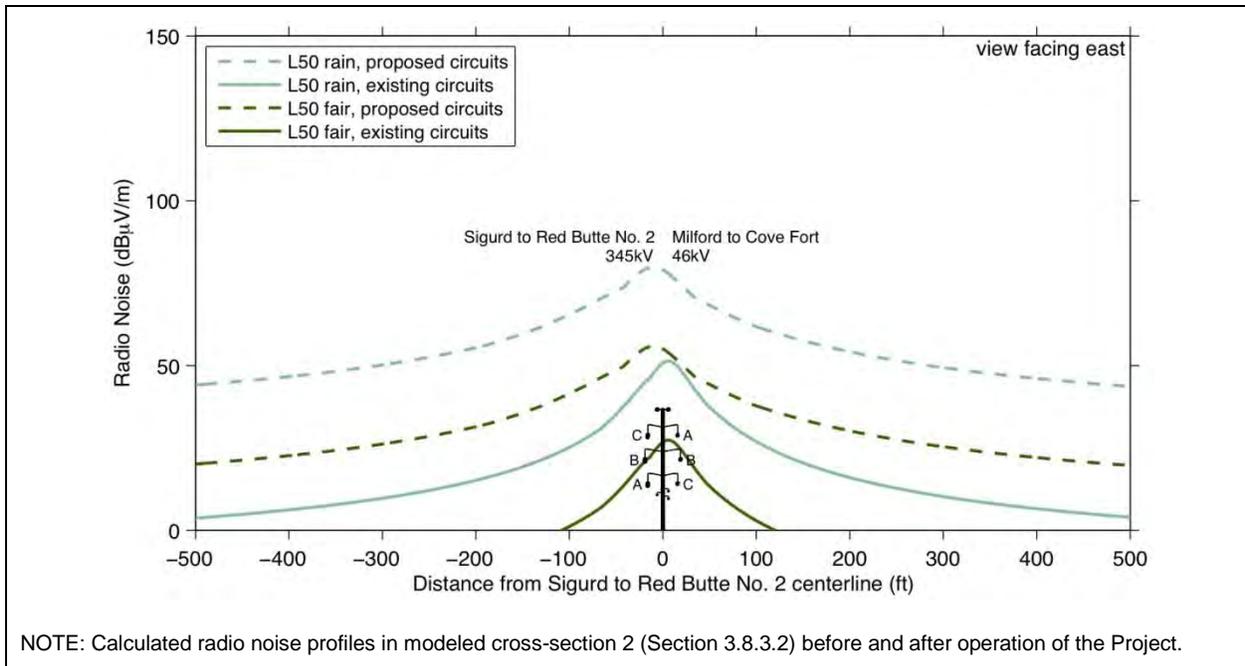


Figure I-19 Calculated Radio Noise in Cross-section 2

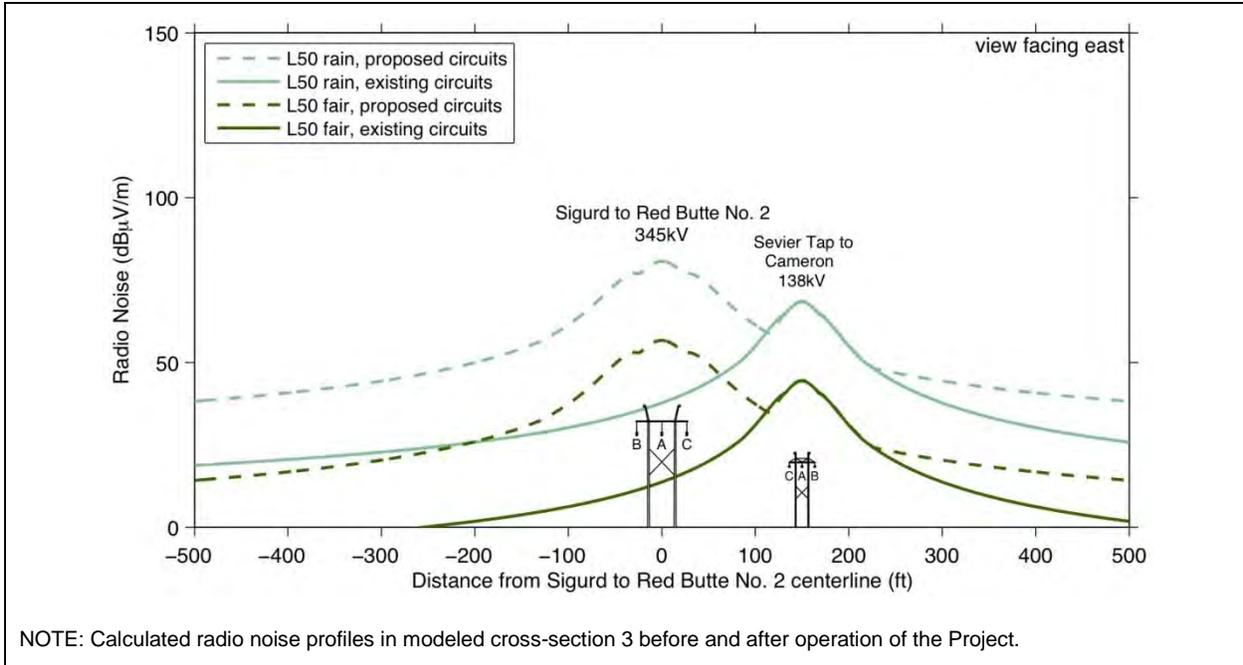


Figure I-20 Calculated Radio Noise in Cross-section 3

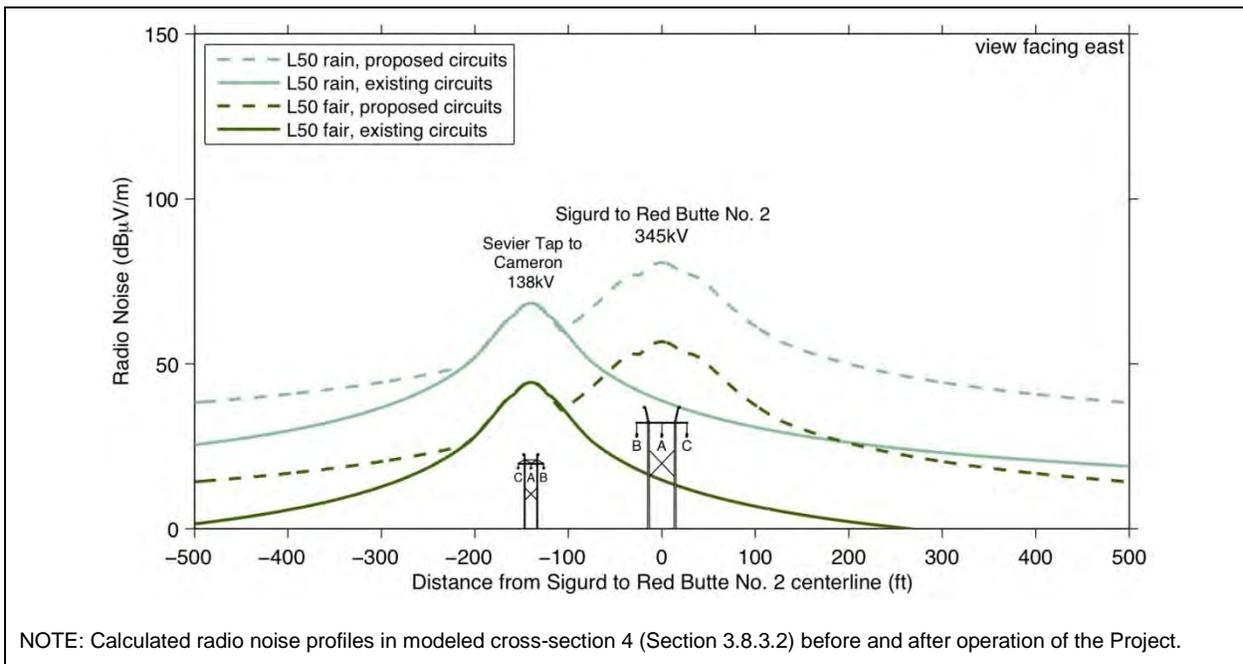


Figure I-21 Calculated Radio Noise in Cross-section 4

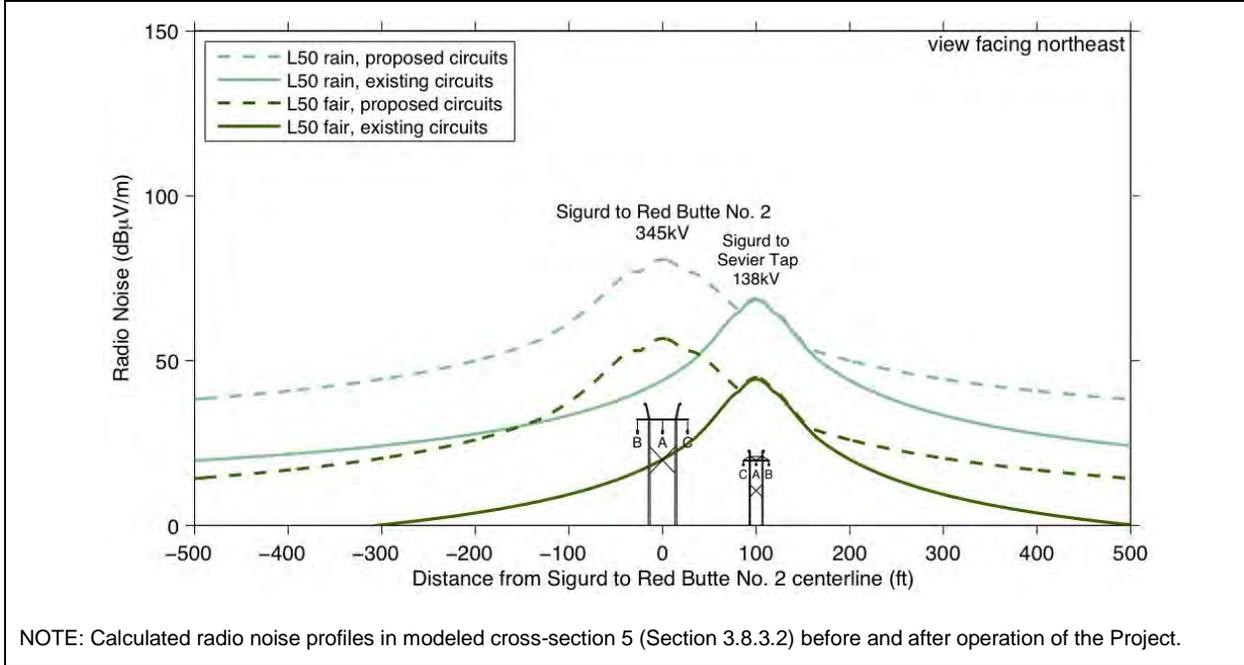


Figure I-22 Calculated Radio Noise in Cross-section 5

I.5 Summary of Calculated Values

Section	Description	Case ¹	Location ²				
			100 Feet Beyond Negative Right-of-way Edge	Negative Right-of-way Edge	Max on Right-of-way	Positive Right-of-way Edge	100 Feet Beyond Positive Right-of-way Edge
1	Sigurd to Red Butte No. 2 – 345kV	Existing	–	–	–	–	–
	Links 25, 45, 64, 63, 349, 390, 475, 395, 396, 397, 163, 444, 441, 221, 220	Proposed	6.6	34.0	128.9	34.0	6.6
2	Double-circuit 345kV/46kV	Existing	0.1	0.3	2.4	0.3	0.1
	Link 75	Proposed	6.0	24.9	72.5	16.6	4.7
3	Sevier Tap to Cameron 138kV south	Existing	0.1	0.3	19.4	2.4	0.5
	Link 66	Proposed	6.5	33.9	129.3	2.5	1.6
4	Sevier Tap to Cameron 138kV north	Existing	0.5	2.4	19.4	0.3	0.1
	Link 66	Proposed	1.7	2.7	129.3	33.8	6.5
5	Sigurd to Sevier Tap 138kV east	Existing	0.3	0.8	34.5	4.3	0.8
	Link 30	Proposed	6.4	33.5	130.6	4.6	2.1

TABLE I-1 CALCULATED MAGNETIC FIELD VALUES (mG) FOR AVERAGE-LOAD CONDITIONS							
Section	Description	Case ¹	Location ²				
			100 Feet Beyond Negative Right-of-way Edge	Negative Right-of-way Edge	Max on Right-of-way	Positive Right-of-way Edge	100 Feet Beyond Positive Right-of-way Edge
_3	Sigurd to Red Butte No. 1 – 345kV	Existing	10.3	52.7	199.5	52.7	10.3
	(Sigurd to Three Peaks 345kV circuit)	Proposed	6.1	31.4	118.9	31.4	6.1
_4	Sigurd to Red Butte No. 1 – 345kV	Existing	9.5	48.5	183.8	48.5	9.5
	(Three Peaks to Red Butte 345kV circuit)	Proposed	5.2	26.8	101.4	26.8	5.2

NOTES:
¹The “existing” case refers to the present configuration of transmission lines with average projected load in 2014 for a north-to-south tie line schedule (i.e., export to the NV Energy southern system). The “proposed” case refers to the same load conditions, with all transmission facilities proposed as part of the Project in operation.
²In cross-section 1, the proposed Sigurd to Red Butte No. 2 345kV line is modeled in the center of a proposed 150 foot right-of-way, with right-of-way edges at ±75 ft. In other cross-sections, the tabulated “right-of-way edge” values are reported at 75 feet beyond the outermost centerline within the section.
³Not on Project route. Fields in the vicinity of existing circuits lowered
⁴Not on Project route.

TABLE I-2 CALCULATED MAGNETIC FIELD VALUES (mG) FOR PEAK-LOAD CONDITIONS							
Section	Description	Case ¹	Location ²				
			100 Feet Beyond Negative Right-of-way Edge	Negative Right-of-way Edge	Max on Right-of-way	Positive Right-of-way Edge	100 Feet Beyond Positive Right-of-way Edge
1	Sigurd to Red Butte No. 2 – 345kV	Existing	–	–	–	–	–
	Links 25, 45, 64, 63, 349, 390, 475, 395, 396, 397, 163, 444, 441, 221, 220	Proposed	10.9	58.8	260.9	58.8	10.9
2	Double-circuit 345kV/46kV	Existing	0.1	0.3	2.5	0.3	0.1
	Link 075	Proposed	10.0	43.8	151.4	29.0	7.9
3	Sevier Tap to Cameron 138kV south	Existing	0.2	0.4	26.5	3.3	0.6
	Link 066	Proposed	10.8	58.6	261.3	4.6	2.7
4	Sevier Tap to Cameron 138kV north	Existing	0.6	3.3	26.5	0.4	0.2
	Link 066	Proposed	3.0	5.5	261.4	58.5	10.8
5	Sigurd to Sevier Tap 138kV east	Existing	0.4	1.0	41.6	5.2	1.0
	Link 030	Proposed	10.6	58.1	262.6	7.3	3.6

TABLE I-2 CALCULATED MAGNETIC FIELD VALUES (mG) FOR PEAK-LOAD CONDITIONS							
Section	Description	Case ¹	Location ²				
			100 Feet Beyond Negative Right-of-way Edge	Negative Right-of-way Edge	Max on Right-of-way	Positive Right-of-way Edge	100 Feet Beyond Positive Right-of-way Edge
_3	Sigurd to Red Butte No. 1 – 345kV	Existing	17.0	91.7	407.0	91.7	17.0
	(Sigurd to Three Peaks 345kV circuit)	Proposed	9.9	53.3	236.6	53.3	9.9
_3	Sigurd to Red Butte No. 1 – 345kV	Existing	16.5	88.9	394.6	88.9	16.5
	(Three Peaks to Red Butte 345kV circuit)	Proposed	8.7	46.9	208.1	46.9	8.7

NOTES:
¹The “existing” case refers to the present configuration of transmission lines with average projected load in 2014 for a north-to-south tie line schedule (i.e., export to the NV Energy southern system). The “proposed” case refers to the same load conditions, with all transmission facilities proposed as part of the Project in operation.
²In cross-section 1, the proposed Sigurd to Red Butte No. 2 345kV line is modeled in the center of a proposed 150 foot right-of-way, with right-of-way edges at ±75 ft. In other cross-sections, the tabulated “right-of-way edge” values are reported at 75 feet beyond the outermost centerline within the section.
³Not on Project route.

TABLE I-3 CALCULATED ELECTRIC FIELD VALUES (kV/m)					
Section	Description	Case	Location ¹		
			Negative Right-of-way Edge	Max on Right-of-way Conductor Height: Average (minimum ²)	Positive Right-of-way Edge
1	Sigurd to Red Butte No. 2 – 345kV	Existing	–	–	–
	Links 25, 45, 64, 63, 349, 390, 475, 395, 396, 397, 163, 444, 441, 221, 220	Proposed	1.76	5.07 (6.50)	1.76
2	Double-circuit 345kV/46kV	Existing	0.04	0.3	0.03
	Link 75	Proposed	0.36	4.67 (6.06)	0.04
3	Sevier Tap to Cameron 138kV south	Existing	0.01	1.42	0.21
	Link 66	Proposed	1.76	5.10 (6.53)	0.18
4	Sevier Tap to Cameron 138kV north	Existing	0.21	1.42	0.01
	Link 66	Proposed	0.17	5.11 (6.54)	1.76
5	Sigurd to Sevier Tap 138kV east	Existing	0.02	1.42	0.21
	Link 30	Proposed	1.76	5.19 (6.62)	0.16

NOTES:
¹In cross-section 1, the proposed Sigurd to Red Butte No. 2 345kV line is modeled in the center of a proposed 150 foot right-of-way, with right-of-way edges at ±75 ft. In other cross-sections, the tabulated “right-of-way edge” values are reported at 75 feet beyond the outermost centerline within the section.
²Tabulated values were calculated at average conductor height. At minimum conductor height, the maximum calculated electric field level in Sections 1-5 was 6.62 kV/m.

TABLE I-4 CALCULATED AUDIBLE NOISE (dBA), L₅₀ FOUL WEATHER					
Section	Description	Case	Location		
			Negative Right-of-way edge	Max on Right-of-way	Positive Right-of-way edge
1	Sigurd to Red Butte No. 2 – 345kV	Existing	–	–	–
	Links 25, 45, 64, 63, 349, 390, 475, 395, 396, 397, 163, 444, 441, 221, 220	Proposed	49.7	53.7	49.7
2	Double-circuit 345kV/46kV	Existing	5.7	11.8	6.1
	Link 75	Proposed	50.6	53.5	49.5
3	Sevier Tap to Cameron 138kV south	Existing	27.0	38.0	32.3
	Link 66	Proposed	49.7	53.7	44.6
4	Sevier Tap to Cameron 138kV north	Existing	32.3	38.0	27.2
	Link 66	Proposed	44.8	53.7	49.7
5	Sigurd to Sevier Tap 138kV east	Existing	28.2	38.0	32.3
	Link 30	Proposed	49.7	53.7	45.7

TABLE I-5 CALCULATED RADIO NOISE (dBμV/M), L₅₀ FAIR WEATHER				
Section	Description	Case	Location¹	
			Minus 100 Feet Beyond Outer Conductor	Minus 100 Feet Beyond Outer Conductor
1	Sigurd to Red Butte No. 2 – 345kV	Existing	–	–
	Links 25, 45, 64, 63, 349, 390, 475, 395, 396, 397, 163, 444, 441, 221, 220	Proposed	32.6	32.6
2	Double-circuit 345kV/46kV	Existing	0.3	2.0
	Link 75	Proposed	39.5	36.4
3	Sevier Tap to Cameron 138kV south	Existing	18.0	18.0
	Link 66	Proposed	32.6	22.1
4	Sevier Tap to Cameron 138kV north	Existing	18.0	18.0
	Link 66	Proposed	22.6	32.6
5	Sigurd to Sevier Tap 138kV east	Existing	18.0	18.0
	Link 30	Proposed	32.6	25

NOTE:

¹In cross-section 1, the proposed Sigurd to Red Butte No. 2 345kV line is modeled in the center of a proposed 150 foot right-of-way, with right-of-way edges at ± 75 ft. In other cross-sections, the tabulated “right-of-way edge” values are reported at 75 feet beyond the outermost centerline within the section.

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