

APPENDIX B

IMPACT TABLES

Table 1
General Route Impacts

Table 1 - General Route Impacts - East Route

Segment ID	Project Total ROW (New + Shared)					Existing ROW (Include only overlapping existing easements)					New ROW		Comments
	Total Segment Length (ft)	Total Segment Length (mi)	Sub-segment or Segment Length (ft)	Total ROW Width (ft)	Total ROW Area (acres)	ROW Type	Shared ROW Length (ft)	Existing ROW Width (ft)	Shared ROW Width (ft)	Shared ROW Area (acres)	New ROW Width (ft)	New ROW Area (acres)	
East Route Segment 1	18,516	3.5	18,516	100	42.5	DL	18,516	100	100	42.5		0.0	rebuild existing 34.5 kV line to double circuit
East Route Segment 2	30,594	5.8	24,193	100	55.5	DL	24,193	100	100	55.5		0.0	rebuild existing 34.5 kV line to double circuit
East Route Segment 2		0.0	183	100	0.4					0.0	100	0.4	new angle at existing corner (due to the existing ROW configuration in this location, there is more ROW sharing than is reflected here)
East Route Segment 2		0.0	6,218	100	14.3	DL	6,218	100	100	14.3		0.0	rebuild existing 34.5 kV line to double circuit
East Route Segment 3	50,536	9.6	26,908	100	61.8	DL	26,908	100	100	61.8		0.0	rebuild existing 34.5 kV line to double circuit
East Route Segment 3		0.0	1,423	150	4.9	DL	1,423	100	100	3.3	50	1.6	additional 50' ROW for blow out and longer span
East Route Segment 3		0.0	15,861	100	36.4	DL	15,861	100	100	36.4		0.0	rebuild existing 34.5 kV line to double circuit
East Route Segment 3		0.0	1,313	125	3.8	DL	1,313	100	100	3.0	25	0.8	additional 25' ROW for blow out and longer span
East Route Segment 3		0.0	5,031	100	11.5	DL	5,031	100	100	11.5		0.0	rebuild existing 34.5 kV line to double circuit
Bypass Line Segment 1	19,594	3.7	19,594	20	9.0					0.0	20	9.0	The Bypass segments follow existing roads, however, Xcel Energy assumes the two are collocated without any ROW sharing.
Bypass Line Segment 2	31,411	5.9	31,411	20	14.4					0.0	20	14.4	The Bypass segments follow existing roads, however, Xcel Energy assumes the two are collocated without any ROW sharing.
Bypass Line Segment 3	5,624	1.1	5,624	20	2.6					0.0	20	2.6	The Bypass segments follow existing roads, however, Xcel Energy assumes the two are collocated without any ROW sharing.
Bypass Line Segment 4	82,818	15.7	82,818	20	38.0					0.0	20	38.0	The Bypass segments follow existing roads, however, Xcel Energy assumes the two are collocated without any ROW sharing.
Total	239,093	45.3			295.2		99,463			228.3		66.8	
Total percent of shared ROW for the proposed project					77%	295.6					295.1		

ROW	Existing ROW Type
Abbreviations	(multiple codes may be used in one row)
TL	Transmission Line (69 kV and Greater)
DL	Distribution Lines (less Than 69 kV)
RR	Railroad
RD	Roadway
GL	Gas Pipeline

DOCKET NO. 4220-CE-182
Table 1 - General Route Impacts - West Route

Segment ID	Project Total ROW					Existing ROW					New ROW		Comments
	Total Segment Length (ft)	Total Segment Length (mi)	Sub-segment or Segment Length (ft)	Total ROW Width (ft)	Total ROW Area (acres)	ROW Type	Shared ROW Length (ft)	Existing ROW Width (ft)	Shared ROW Width (ft)	Shared ROW Area (acres)	New ROW Width (ft)	New ROW Area (acres)	
West Route Segment 1	18,516	3.5	18,516	100	42.5	DL	18,516	100	100	42.5		0.0	rebuild existing 34.5 kV line to double circuit
West Route Segment 2	31,650	6.0	31,650	50	36.3	RD	31,650	50	20	14.5	30	21.8	assumes 20' shared ROW with roads; existing road ROW based on aerial imagery
West Route Segment 3	21,797	4.1	21,797	50	25.0	RD	21,797	50	20	10.0	30	15.0	assumes 20' shared ROW with roads; existing road ROW based on aerial imagery
West Route Segment 4	65,232	12.4	44,464	50	51.0					0.0	50	51.0	West Route Segment 4 generally follows roads for most of its length, however, due to the curvilinear nature of the roads, Xcel Energy assumes the two are collocated without any ROW sharing.
			845	50	1.0	DL	818	50	40	0.8	10	0.2	Route follows Bayfield Electric Distribution line from Structures 194-196
			3,164	50	3.6						50	3.6	Route generally follows Bayfield Electric Distribution line but has no ROW sharing between Structures 196-201
			1,133	50	1.3	DL	1,133	50	40	1.0	10	0.3	Route shares ROW with Bayfield Electric Distribution line from Structures 201-2013
			2,263	50	2.6						50	2.6	Route generally follows Bayfield Electric Distribution line but has no ROW sharing between Structures 203-207
			10,279	50	11.8	DL	10,279	50	40	9.4	10	2.4	Route shares ROW with Bayfield Electric Distribution line from Structures 207-226
			3,084	50	3.5					0.0	50	3.5	Route generally follows Bayfield Electric Distribution line but has no ROW sharing between Structures 226-232 (Pikes Creek Sub)
Bypass Line Segment 1	19,594	3.7	19,594	20	9.0					0.0	20	9.0	The Bypass segments follow existing roads, however, Xcel Energy assumes the two are collocated without any ROW sharing.
Bypass Line Segment 1W	1,275	0.2	1,275	20	0.6					0.0	20	0.6	The Bypass segments follow existing roads, however, Xcel Energy assumes the two are collocated without any ROW sharing.
		0.0			0.0					0.0		0.0	
Total	158,064	29.9			188.3		84,193			78.3		110.0	

Total percent of shared ROW for the proposed project 42%

ROW Abbreviations	Existing ROW Type (multiple codes may be used in one row)
TL	Transmission Line (69 kV and Greater)
DL	Distribution Lines (less Than 69 kV)
RR	Railroad
RD	Roadway
GL	Gas Pipeline

Table Information

***Refer to Example ROW Figure for clarification on categories above.

Total Segment Length (Column B): When multiple rows per segment are used, enter the total length in the first row only. See Sample Table 2, rows 7 and 8.

Sub-segment or Segment Length (Column D): Enter the length of the segment described in each row of the spreadsheet. For most cases it will be the same as the value in Total Segment Length (column B). For segments which don't have the same sharing and new ROW

Total ROW Width (Column E): Enter the total ROW width required assuming no ROW sharing. This value should equal Existing ROW Width Shared (Column J) + New ROW Width (Column L).

Total ROW Area (Column F): The table will calculate the total ROW acres required assuming no ROW sharing. The calculated amount should equal Shared ROW Area (Column K) + New ROW Area (Column M). To avoid double counting ROW area at segment nodes, dissolve

Shared ROW Area (Column K): The table formulas will calculate the proposed acres of shared ROW.

New ROW Width (Column L): Enter the amount of new (additional) ROW width required that would not be shared with other ROWs.

Comments (Column N): Use this column to clarify any information or inconsistencies in the table.

Shaded cells have embedded formulas and will calculate the appropriate values. These cells are protected.

Table 2
Land Cover
(Transmission Line Routes / Off-ROW Access Roads)

DOCKET NO. 4220-CE-182
Table 2 - Land Cover - East Route

Segment ID	Segment Length (ft)	ROW Width (ft)		Agricultural Land Use				Undeveloped Lands										Developed/Urban ⁵		Total ROW Area (acres)	COMMENTS
				Crop Land		Specialty ¹		Grassland ²		Non-Forested Wetland		Forested Wetland			Upland Forest ³						
				Shared ROW Area (acres)	New ROW Area (acres)	Shared ROW Area (acres)	New ROW Area (acres)	Shared ROW Area (acres)	New ROW Area (acres)	Shared ROW Area (acres)	New ROW Area (acres)	Shared ROW Area (acres)	Shared ROW Requiring Clearing ⁴ (acres)	New ROW Area (acres)	Shared ROW Area (acres)	Shared ROW Requiring Clearing ⁴ (acres)	New ROW Area (acres)	Shared ROW Area (acres)	New ROW Area (acres)		
		Shared	New																		
East Route Segment 1	18,516	100	0					5.3		1.0		3.6			25.0			7.6		42.5	
East Route Segment 2	30,594	100	0	0.2				5.8		1.8		1.4			31.8		0.4	28.6		70.0	includes small new angle area at a corner
East Route Segment 3	50,536	100	0					5.4		1.0		1.2			95.7		2.3	12.6		118.2	includes 2 areas of additional ROW needed for longer spans
Bypass Line Segment 1	19,594		20						1.6		0.4			0.3			2.0		3.9	8.2	
Bypass Line Segment 2	31,411		20		0.1				1.3					0.2			4.9		8.0	14.5	
Bypass Line Segment 3	5,624		20														1.3		1.0	2.3	
Bypass Line Segment 4	82,818		20						1.5					0.1			26.9		9.4	37.9	
																				0.0	
Total	239,093	0	60	0.2	0.1	0.0	0.0	16.5	4.4	3.8	0.4	6.2	0.0	0.6	152.5	0.0	37.8	48.8	22.3	293.6	

***Refer to Example ROW Figure for clarification on categories above.

¹Agriculture Specialty includes cranberry bogs, vineyards, ginseng, orchards, tree farms and other specialty crops

²Grassland are defined as any undeveloped landscape dominated by herbaceous (non-woody) vegetation. It may include prairie, pasture, old field, etc.

³Forest areas are defined as any wooded landscape (greater than 20% canopy cover) excluding narrow windbreaks located between agricultural areas, but including wooded areas adjacent to waterways.

⁴Clearing assumes removal of all or nearly all woody vegetation during the construction phase.

⁵Developed/Urban includes residential, commercial, and other developed lands.

GIS Guidance: To avoid double counting ROW area at segment nodes, dissolve overlapping ROW polygons and then cut the dissolved polygon into segments at the segment node

Shaded cells have embedded formulas and will calculate the appropriate values. These cells are protected

Table 2 - Land Cover - West Route

Segment ID	Segment Length (ft)	ROW Width (ft)		Agricultural Land Use				Undeveloped Lands											Developed/Urban ⁵		Total ROW Area (acres)	COMMENTS
				Crop Land		Specialty ¹		Grassland ²		Non-Forested Wetland		Forested Wetland			Upland Forest ³							
		Shared	New	Shared ROW Area (acres)	New ROW Area (acres)	Shared ROW Area (acres)	New ROW Area (acres)	Shared ROW Area (acres)	New ROW Area (acres)	Shared ROW Area (acres)	New ROW Area (acres)	Shared ROW Area (acres)	Shared ROW Requiring Clearing ⁴ (acres)	New ROW Area (acres)	Shared ROW Area (acres)	Shared ROW Requiring Clearing ⁴ (acres)	New ROW Area (acres)	Shared ROW Area (acres)	New ROW Area (acres)			
West Route Segment 1	18,516	100	0					5.3		1.0		3.6			25.0			7.6		42.5		
West Route Segment 2	31,650	20	30					0.8	1.90		0.10	0.3		0.2	3.6		6.7	9.7	13.0	36.3		
West Route Segment 3	21,797	20	30						0.10	0.1	0.20				4.1		6.2	6.0	8.2	24.9		
West Route Segment 4	65,232	40	10	0.1				0.3	0.50			0.3		0.3	8.2		55.4	2.5	7.2	74.8		
Bypass Line Segment 1	19,594	0	20						1.60		0.40			0.3			2.0		3.9	8.2		
Bypass Line Segment 1W	1,275	0	20						0.20											0.2		
Total	158,064	180	110	0.1	0.0	0.0	0.0	6.4	4.3	1.1	0.7	4.2	0.0	0.8	40.9	0.0	70.3	25.8	32.3	186.9		

***Refer to Example ROW Figure for clarification on categories above.

¹Agriculture Specialty includes cranberry bogs, vineyards, ginseng, orchards, tree farms and other specialty crops
Shaded cells have embedded formulas and will calculate the appropriate values. These cells are protected

Table 2 - Land Cover on Off-ROW Access Roads

East Route

Segment ID	Segment Length (ft)	Access Route Width (ft)		Agricultural Land Use				Undeveloped Lands										Developed/Urban ⁵		Total ROW Area (acres)	COMMENTS	
				Crop Land		Specialty ¹		Grassland ²		Non-Forested Wetland		Forested Wetland			Upland Forest ³							
				Shared ROW Area (acres)	New ROW Area (acres)	Shared ROW Area (acres)	New ROW Area (acres)	Shared ROW Area (acres)	New ROW Area (acres)	Shared ROW Area (acres)	New ROW Area (acres)	Shared ROW Area (acres)	Shared ROW Requiring Clearing ⁴ (acres)	New ROW Area (acres)	Shared ROW Area (acres)	Shared ROW Requiring Clearing ⁴ (acres)	New ROW Area (acres)	Shared ROW Area (acres)	New ROW Area (acres)			
East Route off-ROW Access 1	766	15															0.2		0.1	0.3		
East Route off-ROW Access 2	1,689	15							0.10									0.5			0.6	
East Route off-ROW Access 3	246	15																0.1			0.1	
East Route off-ROW Access 4	1,364	15							0.20									0.3			0.5	
East Route off-ROW Access 5	1,368	15							0.30									0.2			0.5	
East Route off-ROW Access 6	607	15																0.2			0.2	
East Route off-ROW Access 7	2,885	15							0.20									0.8			1.0	
East Route off-ROW Access 8	34	15																<0.1			0.0	
East Route off-ROW Access 9	2,689	15							0.20									0.7			0.9	
East Route off-ROW Access 10	2,317	15							0.10									0.7			0.8	
East Route off-ROW Access 11	1,917	15																0.7			0.7	
East Route off-ROW Access 12	2,163	15																0.7			0.7	
East Route off-ROW Access 13	8,709	15																2.6		0.4	3.0	
East Route off-ROW Access 14	7,358	15																2.5			2.5	
East Route off-ROW Access 15	3,034	15																1.0			1.0	
East Route off-ROW Access 16	776	15																0.3			0.3	
East Route off-ROW Access 17	213	15																<0.1		<0.1	0.1	
																					0.0	
																					0.0	
Total	38,135	255	0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.5	0.0	0.5	13.1		

***Refer to Example ROW Figure for clarification on categories above.

¹Agriculture Specialty includes cranberry bogs, vineyards, ginseng, orchards, tree farms and other specialty crops

²Grassland are defined as any undeveloped landscape dominated by herbaceous (non-woody) vegetation. It may include prairie, pasture, old field, etc.

³Forest areas are defined as any wooded landscape (greater than 20% canopy cover) excluding narrow windbreaks located between agricultural areas, but including wooded areas adjacent to waterways.

⁴Clearing assumes removal of all or nearly all woody vegetation during the construction phase.

⁵Developed/Urban includes residential, commercial, and other developed lands.

GIS Guidance: To avoid double counting ROW area at segment nodes, dissolve overlapping ROW polygons and then cut the dissolved polygon into segments at the segment node

Shaded cells have embedded formulas and will calculate the appropriate values. These cells are protected

Table 2 - Land Cover on Off-ROW Access Roads

West Route

Segment ID	Segment Length (ft)	off-ROW Access Road Width (ft)		Agricultural Land Use				Undeveloped Lands									Developed/Urban ⁵		Total ROW Area (acres)	COMMENTS
				Crop Land		Specialty ¹		Grassland ²		Non-Forested Wetland		Forested Wetland			Upland Forest ³					
				Shared ROW Area (acres)	New ROW Area (acres)	Shared ROW Area (acres)	New ROW Area (acres)	Shared ROW Area (acres)	New ROW Area (acres)	Shared ROW Area (acres)	New ROW Area (acres)	Shared ROW Area (acres)	Shared ROW Requiring Clearing ⁴ (acres)	New ROW Area (acres)	Shared ROW Area (acres)	Shared ROW Requiring Clearing ⁴ (acres)	New ROW Area (acres)	Shared ROW Area (acres)	New ROW Area (acres)	
West Route off-ROW Access Road 1	2,291	15														0.8			0.8	
West Route off-ROW Access Road 2	3,806	15														1.3			1.3	
West Route off-ROW Access Road 3	1,704	15														0.6			0.6	
																			0.0	
																			0.0	
																			0.0	
																			0.0	
Total	7,801	45	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	2.7	

***Refer to Example ROW Figure for clarification on categories above.

¹Agriculture Specialty includes cranberry bogs, vineyards, ginseng, orchards, tree farms and other specialty crops
Shaded cells have embedded formulas and will calculate the appropriate values. These cells are protected

Table 3

Federal, State, Local, and Tribal Lands excluding ROWs

Table 3 - Federal, State, Local, and Tribal Lands* Excluding Road ROWs

East Route

Segment ID	Property Owner	Name or Parcel ID	Description	Township, Range, Section (T, R, S)	ROW Length (ft)	ROW Width (ft)		ROW Area (acres)		Correspondence/Approval Status
Federal										
East Route Segment 1	Fish & Wildlife Service USA	Whittlesey Creek National Wildlife Refuge		T48N R5W Sec 35	4281	100	0	6.6	0.0	crossing within existing easement; to be built to double circuit
East Route Segment 1	Forest Service USA	Chequamegon-Nicolet National Forest		T47N R5W Sec 2	2412	100	0	5.1	0.0	crossing within existing easement; to be built to double circuit
Bypass Line Segment 1	Fish & Wildlife Service USA	Whittlesey Creek National Wildlife Refuge		T48N R5W Sec 34 and 35	337	0	20	0.0	0.2	
Bypass Line Segment 1	Forest Service USA	Chequamegon-Nicolet National Forest		T47N R5W Sec 2	1046	0	20	0.0	0.5	
Subtotal					8076			11.7	0.7	
State										
East Route Segment 3	unknown	South Shore Lake Superior Fish and Wildlife Area		T50N R4W Sec 21	981	100	25	2.2	0.5	
East Route Segment 3	Conservation Commission State of Wisconsin	South Shore Lake Superior Fish and Wildlife Area		T49N R4W Sec 17	0	100	0	1.2		The parcel edge is within the 100' ROW; however, the line crosses the adjacent DNR parcel
East Route Segment 3	DNR State of Wisconsin	Nourse Sugarbush SNA		T50N R4W Sec 29	749	100	0	1.7	0.0	
East Route Segment 3	DNR State of Wisconsin	South Shore Lake Superior Fish and Wildlife Area		T50N R4W Sec 17-18, 20-21	6373	100	25	13.2	0.2	Additional ROW (25' total) will be needed along this managed land as Xcel Energy lengthens the span of Pikes Creek
East Route Segment 3	Department of Transportation State of WI	South Shore Lake Superior Fish and Wildlife Area		T50N R4W Sec 21	369	100	0	0.8	0.0	
East Route Segment 3	State of Wisconsin DNR	South Shore Lake Superior Fish and Wildlife Area		T50N R4W Sec 20	73	100	0	0.2	0.0	
Bypass Line Segment 2	DNR State of Wisconsin	South Shore Lake Superior Fish and Wildlife Area		T49N R5W Sec 35 and 36	644	0	20	0.0	0.3	
Bypass Line Segment 4	unknown	South Shore Lake Superior Fish and Wildlife Area		T50N R4W Sec 16 and 21	1565	0	20	0.0	0.7	
Bypass Line Segment 4	DNR State of Wisconsin	South Shore Lake Superior Fish and Wildlife Area		T49N R4W Sec 19 T49N R5W Sec 24	2664	0	20	0.0	1.3	
Subtotal					13418			19.3	3.0	
County										
East Route Segment 3	Bayfield County	Bayfield County Forest		T49N R4W Sec 6-8, 17-18 T50N R4W Sec 20, 29-31	12170	100	0	26.2	0.0	crossing within existing easement; to be built to double circuit
Bypass Line Segment 4	Bayfield County	Bayfield County Forest		T49N R5W Sec 3, 10, 13-14 T50N R5W Sec 13, 18, 23-25, 34-36	47650	0	20	0.0	21.9	
Bypass Line Segment 4	Bayfield County	Bayfield County Forest		T49N R5W Sec 24	1772	0	20	0.0	0.8	
Subtotal					61592			26.2	22.7	
Local										
East Route Segment 1	Town of Barksdale	Sanitary District #1 Town of Barksdale		T48N R5W Sec. 35	275	100	0	0.4	0.0	crossing within existing easement; to be built to double circuit
East Route Segment 2	Town of Washburn	town owned parcel		T48N R5W Sec 1	1305	100	0	3.0	0.0	crossing within existing easement; to be built to double circuit. Along Bourgo Road.
East Route Segment 3	School District #1 City of Washburn	School District #1City of Wasburn		T49N R4W Sec 30	76	100	0	0.2	0.0	
East Route Segment 3	Town of Bayview	town owned parcel		T49N R4W Sec 19	985	100	0	1.3	0.0	
Bypass Line Segment 1	Town of Barksdale	town owned parcels		T48N R5W Sec 34 and 35	407	0	20	0.0	0.2	
Bypass Line Segment 2	Town of Washburn	town owned parcel		T49N R5W Sec 36	60	0	20	0.0	<0.1	
Bypass Line Segment 3	Town of Washburn	town owned parcel		T49N R4W Sec 31	425	0	20	0.0	0.2	
Bypass Line Segment 4	Town of Bayview	town owned parcel		T49N R5W Sec 13	28	0	20	0.0	0.1	
Subtotal					3561			4.9	0.5	
TOTAL					86647			62.1	26.9	

* NOTE: Include properties that are managed by federal or state entities.

DOCKET NO. 4220-CE-182
Table 3 - Federal, State, Local, and Tribal Lands* Excluding Road ROWs
West Route

Segment ID	Property Owner	Name or Parcel ID	Description	Township, Range, Section (T, R, S)	ROW Length (ft)	ROW Width (ft)		ROW Area (acres)		Correspondence/Approval Status
Federal										
West Route Segment 1	Fish & Wildlife Service USA	Whittlesey Creek National Wildlife Refuge	T48N R5W Sec. 35		4281	100	0	6.6	0.0	crossing within existing easement; to be built to double circuit
West Route Segment 1	Forest Service USA	Chequamegon-Nicolet National Forest	T47N R5W Sec. 2		2412	100	0	5.1	0.0	crossing within existing easement; to be built to double circuit
Bypass Line Segment 1	Fish & Wildlife Service USA	Whittlesey Creek National Wildlife Refuge	T48N R5W Sec 34 and 35		397	0	20	0.0	0.2	
Bypass Line Segment 1	Forest Service USA	Chequamegon-Nicolet National Forest	T47N R5W Sec. 2		1046	0	20	0.0	0.5	
Subtotal					8136			11.7	0.7	
State										
West Route Segment 2	Conservation Commission State of Wisconsin	South Shore Lake Superior Fish and Wildlife Area	T49N R5W Sec 27 and 28		65	20	30	0.0	0.0	less than 0.1 acre of impact
West Route Segment 3	Conservation Commission State of Wisconsin	South Shore Lake Superior Fish and Wildlife Area	T49N R5W Sec 27		2569	20	30	1.2	1.8	crossing along Old C Road
West Route Segment 3	DNR State of Wisconsin	South Shore Lake Superior Fish and Wildlife Area	T49N R5W Sec 26, 27, and 35		1724	20	30	0.8	1.2	crossing along County C
West Route Segment 4	Conservation Commission State of Wisconsin	South Shore Lake Superior Fish and Wildlife Area	T49N R5W Sec 27 and 28		1008	0	50	0.0	1.1	crossing along Church Corner Road
West Route Segment 4	unknown	South Shore Lake Superior Fish and Wildlife Area	T50N R4W Sec 16 and 21		1024	0	50	0.0	1.1	crossing along Star Route Road
Subtotal					6390			2.0	5.2	
County										
West Route Segment 4	Bayfield County	Bayfield County Forest	T49N R5W Sec 2-3, 10-11, 13-14, 18-19, 24,-25, 34-36		40857	0	50	0.0	46.2	generally collocated with roads, but assumes no ROW sharing
Subtotal					40857			0.0	46.2	
Local										
West Route Segment 1	Town of Barksdale	Sanitary District #1 Town of Barksdale	T48N R5W Sec. 35		275	100	0	0.4	0.0	crossing within existing easement; to be built to double circuit
West Route Segment 2	Town of Washburn	town owned parcel	T49N R5W Sec. 33 and 34		387	20	30	0.2	0.2	
West Route Segment 3	Town of Washburn	town owned parcels	T49N R5W Sec 25		1329	20	30	0.6	0.9	crossing along County C
West Route Segment 3	City of Washburn	town owned parcels	T49N R4W Sec 31		1305	20	30	0.6	0.9	crossing along County C
Bypass Line Segment 1	Town of Barksdale	town owned parcels	T48N R5W Sec. 34 and 35		407	0	20	0.0	0.2	
Subtotal					3703			1.8	2.2	
TOTAL					59086			15.5	54.3	

* NOTE: Include properties that are managed by federal or state entities.

Table 4
Sensitive Receptors

Table 4 - Distances of Schools, Daycare Centers, and Hospitals from ROW Centerline

East Route

Segment ID	0 - 25 feet			26 - 50 feet			51 - 100 feet			101 - 150 feet			151 - 300 feet			Total Schools	Total Daycare Centers	Total Hospitals	Comments
	Schools	Daycares	Hospitals	Schools	Daycares	Hospitals	Schools	Daycares	Hospitals	Schools	Daycares	Hospitals	Schools	Daycares	Hospitals				
East Route Segment 1																0	0	0	There are no schools, daycares, or hospitals along this segment.
East Route Segment 2																0	0	0	There are no schools, daycares, or hospitals along this segment.
East Route Segment 3																0	0	0	There are no schools, daycares, or hospitals along this segment.
Bypass Line Segment 1																0	0	0	There are no schools, daycares, or hospitals along this segment.
Bypass Line Segment 2																0	0	0	There are no schools, daycares, or hospitals along this segment.
Bypass Line Segment 3																0	0	0	There are no schools, daycares, or hospitals along this segment.
Bypass Line Segment 4																0	0	0	There are no schools, daycares, or hospitals along this segment.
																0	0	0	
																0	0	0	
																0	0	0	
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Shaded cells have embedded formulas and will calculate the appropriate values. These cells are protected.

DOCKET NO. 4220-CE-182

Table 4 - Distances of Schools, Daycare Centers, and Hospitals from ROW Centerline

West Route

Segment ID	0 - 25 feet			26 - 50 feet			51 - 100 feet			101 - 150 feet			151 - 300 feet			Total Schools	Daycare Centers	Hospitals	Comments
	Schools	Daycares	Hospitals	Schools	Daycares	Hospitals	Schools	Daycares	Hospitals	Schools	Daycares	Hospitals	Schools	Daycares	Hospitals				
West Route Segment 1																0	0	0	There are no schools, daycares, or hospitals along this segment.
West Route Segment 2																0	0	0	There are no schools, daycares, or hospitals along this segment.
West Route Segment 3																0	0	0	There are no schools, daycares, or hospitals along this segment.
West Route Segment 4																0	0	0	There are no schools, daycares, or hospitals along this segment.
Bypass Line Segment 1																0	0	0	There are no schools, daycares, or hospitals along this segment.
Bypass Line Segment 1W																0	0	0	There are no schools, daycares, or hospitals along this segment.
																0	0	0	
																0	0	0	
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Shaded cells have embedded formulas and will calculate the appropriate values. These cells are protected.

Table 5

Residential Buildings

Table 5 - Distances of Residential Buildings from ROW Centerline

East Route

Segment ID	0 - 25 feet			26 - 50 feet			51 - 100 feet			101 - 150 feet			151 - 300 feet			Total Homes	Total Apartment Units	Total Apartment Buildings	Comments
	Homes	Apartments		Homes	Apartments		Homes	Apartments		Homes	Apartments		Homes	Apartments					
		Units	Buildings		Units	Buildings		Units	Buildings		Units	Buildings		Units	Buildings				
Segment 1							1			2			5			8	0	0	
East Route Segment 2										2			11			13	0	0	
East Route Segment 3	1									3			9			13	0	0	
Bypass Line Segment 1	1						4			4			1			10	0	0	
Bypass Line Segment 2							1			3			15			19	0	0	
Bypass Line Segment 3							5			1			11			17	0	0	
Bypass Line Segment 4																0	0	0	
																0	0	0	
Totals	2	0	0	0	0	0	11	0	0	15	0	0	52	0	0	80	0	0	



Shaded cells have embedded formulas and will calculate the appropriate values. These cells are protected.

Table 5 - Distances of Residential Buildings from ROW Centerline

West Route

Segment ID	0 - 25 feet			26 - 50 feet			51 - 100 feet			101 - 150 feet			151 - 300 feet			Total Homes	Total Apartment Units	Total Apartment Buildings	
	Homes	Apartments		Homes	Apartments		Homes	Apartments		Homes	Apartments		Homes	Apartments					
		Units	Buildings		Units	Buildings		Units	Buildings		Units	Buildings		Units	Buildings				
West Route Segment 1							1			2			5			8	0	0	
West Route Segment 2							1			4			21			26	0	0	
West Route Segment 3							1			3			11			15	0	0	
West Route Segment 4	1						3			3			9			16	0	0	
Bypass Line Segment 1	1						4			4			1			10	0	0	
Bypass Line Segment 1W																0	0	0	
																0	0	0	
Totals	2	0	0	0	0	0	10	0	0	16	0	0	47	0	0	75	0	0	

Shaded cells have embedded formulas and will calculate the appropriate values. These cells are protected.

Table 6
Magnetic Field Calculations
(See Appendix E)

Table 7
Route Impact Summaries

Table 7 - Route Impact Summaries

Route	Total Length (ft)	Total Length (mi)	ROW Area (acres)				Upland (Acres)				Wetlands (Acres)			Distance of Homes from ROW Centerline						Distance of Apartment Units and Buildings From ROW Centerline											
			Total	New	Shared	Percent Shared	Total Agriculture ¹	Total Grass-lands ²	Shared ROW Forest ^{3,4}	New ROW Forest ^{3,4}	Shared ROW Forested Wetlands	New ROW Forested Wetlands	Total Non-Forested Wetland	0 - 25 feet	26 - 50 feet	51 - 100 feet	101 - 150 feet	151 - 300 feet	Total Homes	0 - 25 feet		26 - 50 feet		51 - 100 feet		101 - 150 feet		151 - 300 feet		Total Apartment Units	Total Apartment Buildings
																				Units	Bldgs	Units	Bldgs	Units	Bldgs	Units	Bldgs	Units	Bldgs		
West Route	158,064	29.9	188.3	110.0	78.3	42%	0.1	10.7	40.9	70.3	4.2	0.8	1.8	2	0	10	16	47	75											0	0
East Route	239,093	45.3	295.1	66.8	228.3	77%	0.2	20.9	152.5	37.8	6.2	0.6	4.2	2	0	11	15	52	80											0	0

Shaded cells have embedded formulas and will calculate the appropriate values. These cells are protected.

¹Agriculture includes all crop lands and specialty crops such as cranberry bogs, vineyards, ginseng, orchards, tree farms and other specialty crops.

²Grassland are defined as any undeveloped landscape dominated by herbaceous (non-woody) vegetation. It may include prairie, pasture, old field, etc.

³Forest areas are defined as any wooded landscape (greater than 20% canopy cover) excluding narrow windbreaks located between agricultural areas, but including wooded areas adjacent to waterways.

⁴Clearing assumes removal of all or nearly all woody vegetation during the construction phase.

GIS Guidance: To avoid double counting ROW area at segment nodes, dissolve overlapping ROW polygons and then cut the dissolved polygon into segments at the segment node

Table 8
WDNR Wetland/Waterway Impact Location
(Supplement to WDNR Form 3500—53)

Table 8 DNR Wetland/Waterway Impact Location Table - East Route

Supplement Document to WDNR Form 3500-53. Check all that apply.
 Note: Any revisions to this table must be agreed upon by all parties before filing.

RESOURCE					CONSTRUCTION METHOD/ACTIVITY											LOCATION						RESOURCE IMPACT					DNR DOCKET ¹¹	
Route/ Segment	Wetland Type or Waterway Name ¹	Feature Unique ID ²	WBIC Code	Permit Required	Bridge ³	Waterway Impact Activity		Grading on banks (upland) over 10,000 sq. ft. ⁵	Placement Structure/Fill Placement (square feet) ⁶	Plow ⁷ (linear feet)	HDD ⁷ (linear feet)	Wetland Impact Activity					County	Municipality	QQ	Q	Section	Township (N), Range (E/W)	ASNRI	Temporary Fill (square feet)	Permanent Fill (square feet)	Conversion ¹⁰ (square feet)		
						square feet	cubic yards					Matting ⁸ (square feet)	Trench ⁹ (square feet)	Bore Pits (square feet)	Structure # if located in Wetland	Grading (square feet)												
Bypass Line Segment 1	Unnamed	S-01	2887900			0	0	0	0	0	0						Bayfield	Barksdale town	SW	SW	35	48N, 05W	No					
Bypass Line Segment 1	Whittlesey Creek	S-02	2887200			0	0	0	0	0	0						Bayfield	Barksdale town	NW	SW	35	48N, 05W	Yes					
Bypass Line Segment 1	Unnamed	S-04	2887300			0	0	0	0	0	0						Bayfield	Barksdale town	NE	NE	34	48N, 05W	Yes					
Bypass Line Segment 1	Unnamed	S-05	5001127			0	0	0	0	0	0						Bayfield	Barksdale town	SE	NE	34	48N, 05W	No					
Bypass Line Segment 1	Unnamed	S-07	5001103	Yes	TCSB-2E	0	0	0	0	0	0						Bayfield	Barksdale town	SE	NE	27	48N, 05W	No					
Bypass Line Segment 1	Unnamed	S-08	5001086	Yes	TCSB-3E	0	0	0	0	0	0						Bayfield	Barksdale town	NE	NE	27	48N, 05W	No					
Bypass Line Segment 1	Boyd Creek	S-09	2887000			0	0	0	0	0	0						Bayfield	Barksdale town	NE	SE	22	48N, 05W	No					
Bypass Line Segment 1	Unnamed	S-10	5001014	Yes	TCSB-4E	0	0	0	0	0	0						Bayfield	Barksdale town	SE	NE	22	48N, 05W	No					
Bypass Line Segment 2	Bono Creek	S-11	2886900			0	0	0	0	0	0						Bayfield	Barksdale town	SE	SE	15	48N, 05W	Yes					
Bypass Line Segment 2	Unnamed	S-12	5000981			0	0	0	0	0	0						Bayfield	Barksdale town	SE	SE	15	48N, 05W	No					
Bypass Line Segment 2	Unnamed	S-14	5000925			0	0	0	0	0	0						Bayfield	Barksdale town	NE	SE	15	48N, 05W	No					
Bypass Line Segment 2	Unnamed	S-15	5000916			0	0	0	0	0	0						Bayfield	Barksdale town	NE	NE	15	48N, 05W	No					
Bypass Line Segment 2	Unnamed	S-17	5000871			0	0	0	0	0	0						Bayfield	Washburn town	SE	NE	10	48N, 05W	No					
Bypass Line Segment 2	Thompson Creek	S-18	2886800			0	0	0	0	0	0						Bayfield	Washburn town	SE	NE	10	48N, 05W	Yes					
Bypass Line Segment 2	Unnamed	S-20	5000739			0	0	0	0	0	0						Bayfield	Washburn town	NW	SW	2	48N, 05W	No					
Bypass Line Segment 2	Unnamed	S-21	5000728			0	0	0	0	0	0						Bayfield	Washburn town	SW	NE	2	48N, 05W	No					
Bypass Line Segment 2	Unnamed	S-24	5000708	Yes	TCSB-5E	0	0	0	0	0	0						Bayfield	Washburn town	SE	SE	35	49N, 05W	No					
Bypass Line Segment 3	Unnamed	S-26	5000677	Yes	TCSB-8E	0	0	0	0	0	0						Bayfield	Washburn city	SE	NW	31	49N, 04W	No					
Bypass Line Segment 3	Unnamed	S-27	5000673	Yes	TCSB-9E	0	0	0	0	0	0						Bayfield	Washburn city	SE NE	NW SW	31	49N, 04W	No					
Bypass Line Segment 3	Unnamed	S-29	5000666	Yes	TCSB-7E	0	0	0	0	0	0						Bayfield	Washburn city	SE	NW	31	49N, 04W	No					
Bypass Line Segment 4	Unnamed	S-36	5000622			0	0	0	0	0	0						Bayfield	Bayview town	NE	NE	25	49N, 05W	No					
Bypass Line Segment 4	Sioux River	S-37	2886000			0	0	0	0	0	0						Bayfield	Bayview town	SE	NE	24	49N, 05W	Yes					
Bypass Line Segment 4	Unnamed	S-43	5000540			0	0	0	0	0	0						Bayfield	Bayview town	SW	SE	13	49N, 05W	No					
Bypass Line Segment 4	Unnamed	S-50	5000481			0	0	0	0	0	0						Bayfield	Bayview town	NW	SE	3	49N, 05W	No					
Bypass Line Segment 4	Little Sioux River	S-52	2886100			0	0	0	0	0	0						Bayfield	Bayview town	NE	NE	3	49N, 05W	Yes					
Bypass Line Segment 4	Unnamed	S-56	5000388	Yes	TCSB-3W	0	0	0	0	0	0						Bayfield	Bayfield town	SW	SW	24	50N, 05W	No					
Bypass Line Segment 4	Unnamed	S-57	5000373			0	0	0	0	0	0						Bayfield	Bayfield town	SW	NW	24	50N, 05W	No					
Bypass Line Segment 4	Pikes Creek	S-59	2884500			0	0	0	0	0	0						Bayfield	Bayfield town	SW	NW	24	50N, 05W	Yes					
Bypass Line Segment 4	Unnamed	S-64	5000345	Yes	TCSB-15E	0	0	0	0	0	0						Bayfield	Bayfield town	NE	NE	21	50N, 04W	No					
Bypass Line Segment 4	Unnamed	S-66	5000339			0	0	0	0	0	0						Bayfield	Bayfield town	SW	SE	17	50N, 04W	No					
Bypass Line Segment 4	Unnamed	S-67	2885300			0	0	0	0	0	0						Bayfield	Bayfield town	NW	NW	24	50N, 05W	No					
Bypass Line Segment 4	Unnamed	S-68	5000335			0	0	0	0	0	0						Bayfield	Bayfield town	NW	NW	21	50N, 04W	No					
Bypass Line Segment 4	North Pikes Creek	S-69	2885100			0	0	0	0	0	0						Bayfield	Bayfield town	SW	SW	16	50N, 04W	Yes					
Bypass Line Segment 4	Unnamed	S-70	5000319			0	0	0	0	0	0						Bayfield	Bayfield town	SW	SE	18	50N, 04W	No					
East Route Segment 1	Unnamed	S-01	2887900			0	0	0	0	0	0						Bayfield	Barksdale town	SW	SW	35	48N, 05W	No					
East Route Segment 1	Whittlesey Creek	S-02	2887200			0	0	0	0	0	0						Bayfield	Barksdale town	SW	NW	35	48N, 05W	Yes					
East Route Segment 1	Unnamed	S-03	2887300			0	0	0	0	0	0						Bayfield	Barksdale town	SW	NW	35	48N, 05W	Yes					
East Route Segment 1	Unnamed	S-06	5001123	Yes	TCSB-1E	0	0	0	0	0	0						Bayfield	Barksdale town	NW	NW	35	48N, 05W	No					
East Route Segment 1	Unnamed	S-07	5001103	Yes	TCSB-2E	0	0	0	0	0	0						Bayfield	Barksdale town	SW	NW	26	48N, 05W	No					
East Route Segment 1	Unnamed	S-08	5001086	Yes	TCSB-3E	0	0	0	0	0	0						Bayfield	Barksdale town	NW	NW	26	48N, 05W	No					
East Route Segment 1	Boyd Creek	S-09	2887000			0	0	0	0	0	0						Bayfield	Barksdale town	SW	SW	23	48N, 05W	No					

RESOURCE					CONSTRUCTION METHOD/ACTIVITY											LOCATION						RESOURCE IMPACT				DNR DOCKET ¹¹
					Waterway Impact Activity			Placement Structure/Fill Placement (square feet) ⁶	Plow ⁷ (linear feet)	HDD ⁷ (linear feet)	Wetland Impact Activity					County	Municipality	QQ	Q	Section	Township (N), Range (E/W)	ASNRI	Temporary Fill (square feet)	Permanent Fill (square feet)	Conversion ¹⁰ (square feet)	
Route/ Segment	Wetland Type or Waterway Name ¹	Feature Unique ID ²	WBIC Code	Permit Required	Bridge ³	Dredge ⁴					Grading on banks (upland) over 10,000 sq. ft. ⁵	Matting ⁸ (square feet)	Trench ⁹ (square feet)	Bore Pits (square feet)	Structure # if located in Wetland											
East Route Segment 1	Unnamed	S-10	5001014	Yes	TCSB-4E	0	0	0	0	0	0				Bayfield	Barksdale town	NW	SW	23	48N, 05W	No					
East Route Segment 2	Bono Creek	S-13	2886900			0	0	0	0	0	0				Bayfield	Barksdale town	SW	SW	13	48N, 05W	Yes					
East Route Segment 2	Unnamed	S-16	5000904			0	0	0	0	0	0				Bayfield	Barksdale town	NW	SW	13	48N, 05W	No					
East Route Segment 2	Unnamed	S-19	5000850			0	0	0	0	0	0				Bayfield	Washburn town	NW, SW	NW	12	48N, 05W	No					
East Route Segment 2	Thompson Creek	S-22	2886800			0	0	0	0	0	0				Bayfield	Washburn town	SW	SE	36	49N, 05W	Yes					
East Route Segment 2 - Off ROW Access	Unnamed	S-24	5000708	Yes	TCSB-5E	0	0	0	0	0	0				Bayfield	Washburn town	SW	SE	36	49N, 05W	No					
East Route Segment 2	Unnamed	S-25	5000680	Yes	TCSB-6E	0	0	0	0	0	0				Bayfield	Washburn town	SE	SE	36	49N, 05W	No					
East Route Segment 2 - Off ROW Access Road	Unnamed	S-25	5000680	Yes	TCSB-16E	0	0	0	0	0	0				Bayfield	Washburn town	SE	SE	36	49N, 05W	No					
East Route Segment 2	Unnamed	S-26	5000677	Yes	TCSB-8E	0	0	0	0	0	0				Bayfield	Washburn city	NE	SW	31	49N, 04W	No					
East Route Segment 2	Unnamed	S-27	5000673	Yes	TCSB-10E	0	0	0	0	0	0				Bayfield	Washburn city	NE	SW	31	49N, 04W	No					
East Route Segment 2	Unnamed	S-29	5000666	Yes	TCSB-7E	0	0	0	0	0	0				Bayfield	Washburn city	NW	SW	31	49N, 04W	No					
East Route Segment 2	Unnamed	S-30	5000659			0	0	0	0	0	0				Bayfield	Washburn town	NE	SE	36	49N, 05W	No					
East Route Segment 3	Unnamed	S-27	5000673	Yes	TCSB-10E	0	0	0	0	0	0				Bayfield	Washburn city	SE NE	NW SW	31	49N, 04W	No					
East Route Segment 3	Unnamed	S-39	5000656	Yes	TCSB-11E	0	0	0	0	0	0				Bayfield	Bayview town	SW	SE	30	49N, 04W	No					
East Route Segment 3	Unnamed	S-41	5000580	Yes	TCSB-12E	0	0	0	0	0	0				Bayfield	Bayview town	SE	SE	18	49N, 04W	No					
East Route Segment 3	Unnamed	S-41	5000580	Yes	TCSB-12E	0	0	0	0	0	0				Bayfield	Bayview town	SE	NE	19	49N, 04W	No					
East Route Segment 3	Sioux River	S-44	2886000			0	0	0	0	0	0				Bayfield	Bayview town	SE	NE	18	49N, 04W	Yes					
East Route Segment 3	Unnamed	S-46	5000502	Yes	TCSB-13E	0	0	0	0	0	0				Bayfield	Bayview town	SE	SE	7	49N, 04W	No					
East Route Segment 3	Unnamed	S-47	2885800			0	0	0	0	0	0				Bayfield	Bayview town	NE	SE	6	49N, 04W	No					
East Route Segment 3	Unnamed	S-48	2885600			0	0	0	0	0	0				Bayfield	Bayview town	SE	SE	6	49N, 04W	No					
East Route Segment 3	Onion River	S-49	2885500			0	0	0	0	0	0				Bayfield	Bayview town	SE	NE	6	49N, 04W	Yes					
East Route Segment 3	Unnamed	S-53	2885700			0	0	0	0	0	0				Bayfield	Bayview town	NE	NE	6	49N, 04W	Yes					
East Route Segment 3	Unnamed	S-54	2884900	Yes	TCSB-14E	0	0	0	0	0	0				Bayfield	Bayfield town	SE	SE	20	50N, 04W	No					
East Route Segment 3 - Off ROW Access	Unnamed	S-71	2885000	Yes	TCSB-17E	0	0	0	0	0	0				Bayfield	Bayfield town	NE	NE	30	50N, 04W	No					
East Route Segment 3	Unnamed	S-55	2885000			0	0	0	0	0	0				Bayfield	Bayfield town	SE	SE	20	50N, 04W	Yes					
East Route Segment 3	North Pikes Creek	S-58	2885100			0	0	0	0	0	0				Bayfield	Bayfield town	NW	SW	21	50N, 04W	Yes					
East Route Segment 3	Pikes Creek	S-60	2884500			0	0	0	0	0	0				Bayfield	Bayfield town	NW	SW	21	50N, 04W	Yes					
East Route Segment 3	Birch Run	S-61	2884600			0	0	0	0	0	0				Bayfield	Bayfield town	NW	NE	21	50N, 04W	Yes					
East Route Segment 3	Unnamed	S-64	5000345	Yes	TCSB-15E	0	0	0	0	0	0				Bayfield	Bayfield town	NE	NE	21	50N, 04W	No					
Bypass Line Segment 1	Scrub/shrub, Emergent/wet meadow	W-28		Yes		0	0	0	0	0	0	760.20			Bayfield	Barksdale town	NW	SW	35	48N, 05W	No	760.20		760.20		
Bypass Line Segment 1	Emergent/wet meadow	W-29		Yes		0	0	0	0	0	0	2,719.25			Bayfield	Barksdale town	SW	SW	35	48N, 05W	No	2,719.25				
Bypass Line Segment 2	Emergent/wet meadow	W-15		Yes		0	0	0	0	0	0	1,818.31			Bayfield	Washburn town	NW, SW	NE	2	48N, 05W	No	1,818.31				
Bypass Line Segment 4	Scrub/shrub, Emergent/wet meadow	W-02		Yes		0	0	0	0	0	0	1,365.44			Bayfield	Bayfield town	NW	NW	24	50N, 05W	No	1,365.44		1,365.44		
Bypass Line Segment 4	Scrub/shrub, Emergent/wet meadow	W-03		Yes		0	0	0	0	0	0	149.28			Bayfield	Bayfield town	SE SW	NE NW	23 24	50N, 05W	No	149.28		149.28		
East Route Segment 1	Forested	W-18				0	0	0	0	0	0	0.00			Bayfield	Barksdale town	NW, SW	NW	23	48N, 05W	No			3,143.20		
East Route Segment 1	Forested	W-21				0	0	0	0	0	0	0.00			Bayfield	Barksdale town	NW	NW	23	48N, 05W	No			4,938.12		
East Route Segment 1	Emergent/wet meadow	W-22		Yes		0	0	0	0	0	0	30,440.79		W3601-103, W3601-104, W3601-105	Bayfield	Barksdale town	NW, SW	NW	23	48N, 05W	No	30,440.79	37.64			
East Route Segment 1	Forested	W-23				0	0	0	0	0	0	0.00			Bayfield	Barksdale town	NW, SW	NW	23	48N, 05W	No			14,734.66		
East Route Segment 1	Forested	W-24				0	0	0	0	0	0	0.00			Bayfield	Barksdale town	SW NW	NW SW	23	48N, 05W	No			5,861.60		
East Route Segment 1	Forested	W-25		Yes		0	0	0	0	0	0	6,602.14		W3601-90	Bayfield	Barksdale town	NW	NW	26	48N, 05W	No	6,602.14	38.42	21,801.64		

RESOURCE					CONSTRUCTION METHOD/ACTIVITY												LOCATION						RESOURCE IMPACT				DNR DOCKET ¹¹																						
Route/ Segment	Wetland Type or Waterway Name ¹	Feature Unique ID ²	WBIC Code	Permit Required	Bridge ³	Waterway Impact Activity			Placement Structure/Fill Placement (square feet) ⁶	Plow ⁷ (linear feet)	HDD ⁷ (linear feet)	Wetland Impact Activity					County	Municipality	QQ	Q	Section	Township (N), Range (E/W)	ASNRI	Temporary Fill (square feet)	Permanent Fill (square feet)	Conversion ¹⁰ (square feet)																							
						Dredge ⁴		Grading on banks (upland) over 10,000 sq. ft. ⁵				Matting ⁸ (square feet)	Trench ⁹ (square feet)	Bore Pits (square feet)	Structure # if located in Wetland	Grading (square feet)																																	
						square feet	cubic yards																																										
East Route Segment 1	Forested	W-26		Yes		0	0	0	0	0	0	2,576.89					Bayfield	Barksdale town	SW, SE NE	NW SW	26	48N, 05W	No	2,576.89			8,515.43																						
East Route Segment 1	Forested	W-27		Yes		0	0	0	0	0	0	965.02					Bayfield	Barksdale town	NE, NW, S	NW	35	48N, 05W	No	965.02			6,628.01																						
East Route Segment 1	Scrub/shrub, Emergent/wet meadow	W-28		Yes		0	0	0	0	0	0	3,350.61					Bayfield	Barksdale town	NW	SW	35	48N, 05W	No	3,350.61			5,222.62																						
East Route Segment 1	Emergent/wet meadow	W-29		Yes		0	0	0	0	0	0	5,783.63			W3601-64		Bayfield	Barksdale town	SW	SW	35	48N, 05W	No	5,783.63	3.83																								
East Route Segment 1	Emergent/wet meadow	W-30		Yes		0	0	0	0	0	0	12,625.38			W3601-58		Bayfield	Eileen town	NW, SW	NW	2	47N, 05W	No	12,625.38	12.55																								
East Route Segment 2	Forested	W-16				0	0	0	0	0	0	0.00					Bayfield	Washburn town	SW	SW	1	48N, 05W	No				56.01																						
East Route Segment 2	Forested	W-17		Yes		0	0	0	0	0	0	3,728.53					Bayfield	Washburn town	NW, SW	NW	12	48N, 05W	No	3,728.53			17,977.91																						
East Route Segment 2	Forested, Scrub/shrub	W-19				0	0	0	0	0	0	0.00					Bayfield	Barksdale town	NW, NE	NE	23	48N, 05W	No				2,504.51																						
East Route Segment 2	Forested	W-20				0	0	0	0	0	0	0.00					Bayfield	Barksdale town	NE	NE	23	48N, 05W	No				2,433.87																						
East Route Segment 2	Forested	W-31		Yes		0	0	0	0	0	0	17.77					Bayfield	Barksdale town	SE	SE	14	48N, 05W	No	17.77			2,252.88																						
East Route Segment 3	Forested	W-06		Yes		0	0	0	0	0	0	20,228.78					Bayfield	Bayview town	SW NW SE NE	NW SW NE SE	5 6	49N, 04W	No	20,228.78			99,427.91																						
East Route Segment 3	Forested	W-07		Yes		0	0	0	0	0	0	4,058.15					Bayfield	Bayview town	NW NE	SW SE	5 6	49N, 04W	No	4,058.15			20,851.18																						
East Route Segment 3	Scrub/shrub, Emergent/wet meadow	W-08		Yes		0	0	0	0	0	0	41,219.57			W3603-90, W3603-91, W3603-92, W3603-93, W3603-94		Bayfield	Bayview town	NW, SW NE, SE	NW NE	17 18	49N, 04W	No	41,219.57	62.73		115,600.66																						
East Route Segment 3	Forested	W-09		Yes		0	0	0	0	0	0	6,580.01					Bayfield	Bayview town	SW SE	NW NE	17 18	49N, 04W	No	6,580.01			33,653.87																						
East Route Segment 3	Forested	W-10				0	0	0	0	0	0	0.00					Bayfield	Bayview town	SE	NE	18	49N, 04W	No				994.90																						
East Route Segment 3	Forested	W-11				0	0	0	0	0	0	0.00					Bayfield	Bayview town	SE	NE	19	49N, 04W	No				14,588.82																						
East Route Segment 3	Emergent/wet meadow	W-12				0	0	0	0	0	0	0.00					Bayfield	Bayview town	NE	NE	30	49N, 04W	No																										
East Route Segment 3	Forested, Scrub/shrub	W-13		Yes		0	0	0	0	0	0	2,122.19					Bayfield	Bayview town	NE, SE	NE	30	49N, 04W	No	2,122.19			12,740.69																						
East Route Segment 3	Forested	W-14				0	0	0	0	0	0	0.00					Bayfield	Bayview town	SE	NE	30	49N, 04W	No				6,998.82																						
																																																</	

Notes:

¹ For wetlands, state the wetland type using the Eggars and Reed Classification system. For waterways, indicate where water flows (e.g. UNT to Silver Creek) (UNT = unnamed tributary). Include all waterways mapped in the DNR Surface Water Data Viewer webtool that cross the project path.

² Insert the code or other reference used in application (e.g. W-3, S-27)

³ Indicate the number of bridges needed

⁴ For underground line placement only If the waterway will be dredged, indicate the area (length by width) and volume (length by width by depth) of bed material to be removed and backfilled (temporary dredge)

⁵ Only complete this column if the upland banks of the waterway will be graded in excess of 10,000 sq. ft., and if the project is not located in Milwaukee County, if the project will not require a local grading/shoreland permit, and if the project will not require a WDNR construction stormwater permit

⁶ If a permanent structure or permanent fill will be placed in wetland or waterway (i.e. pole structures, padmount, substation, power plant, etc.), incidate the area (length by width) of permanent fill

⁷ For underground line placement only

⁸ If construction matting (i.e. timber, composite, etc.) will be placed in wetland for vehicle/equipment access or under soil stockpiles, or on the waterway bed for access, indicate the area (length by width) of matting to be placed in wetland (temporary fill) or waterway

⁹ For underground line placement only. If the wetland will be trenched, indicate the area (length by width) of soil to be removed and backfilled (temporary fill).

¹⁰ Conversion impact refers to vegetative clearing of forested and/or shrub wetlands, resulting in an herbaceous wetland, for the purposes of construction

¹¹ Assigned and to be completed by the DNR

(please submit in excel format)

Table 8 DNR Wetland/Waterway Impact Location Table - West Route

Supplement Document to WDNR Form 3500-53. Check all that apply.
Note: Any revisions to this table must be agreed upon by all parties before filing.

RESOURCE					CONSTRUCTION METHOD/ACTIVITY												LOCATION						RESOURCE IMPACT					DNR DOCKET ¹¹
Route/ Segment	Wetland Type or Waterway Name ¹	Feature Unique ID ²	WBIC Code	Permit Required	Bridge ³	Waterway Impact Activity		Grading on banks (upland) over 10,000 sq. ft. ⁵	Placement Structure/Fill Placement (square feet) ⁶	Plow ⁷ (linear feet)	HDD ⁷ (linear feet)	Wetland Impact Activity					County	Municipality	QQ	Q	Section	Township (N), Range (E/W)	ASNRI	Temporary Fill (square feet)	Permanent Fill (square feet)	Conversion ¹⁰ (square feet)		
						square feet	cubic yards					Matting ⁸ (square feet)	Trench ⁹ (square feet)	Bore Pits (square feet)	Structure # if located in Wetland	Grading (square feet)												
Bypass Line Segment 1	Unnamed	S-01	2887900			0	0	0	0	0	0						Bayfield	Barksdale town	SW	SW	35	48N, 05W	No					
Bypass Line Segment 1	Whittlesey Creek	S-02	2887200			0	0	0	0	0	0						Bayfield	Barksdale town	NW	SW	35	48N, 05W	Yes					
Bypass Line Segment 1	Unnamed	S-04	2887300			0	0	0	0	0	0						Bayfield	Barksdale town	NE	NE	34	48N, 05W	Yes					
Bypass Line Segment 1	Unnamed	S-05	5001127			0	0	0	0	0	0						Bayfield	Barksdale town	SE	NE	34	48N, 05W	No					
Bypass Line Segment 1	Unnamed	S-07	5001103	Yes	TCSB-2E	0	0	0	0	0	0						Bayfield	Barksdale town	SE	NE	27	48N, 05W	No					
Bypass Line Segment 1	Unnamed	S-08	5001086	Yes	TCSB-3E	0	0	0	0	0	0						Bayfield	Barksdale town	NE	NE	27	48N, 05W	No					
Bypass Line Segment 1	Boyd Creek	S-09	2887000			0	0	0	0	0	0						Bayfield	Barksdale town	NE	SE	22	48N, 05W	No					
Bypass Line Segment 1	Unnamed	S-10	5001014	Yes	TCSB-4E	0	0	0	0	0	0						Bayfield	Barksdale town	SE	NE	22	48N, 05W	No					
West Route Segment 1	Unnamed	S-01	2887900			0	0	0	0	0	0						Bayfield	Barksdale town	SW	SW	35	48N, 05W	No					
West Route Segment 1	Whittlesey Creek	S-02	2887200			0	0	0	0	0	0						Bayfield	Barksdale town	SW	NW	35	48N, 05W	Yes					
West Route Segment 1	Unnamed	S-03	2887300			0	0	0	0	0	0						Bayfield	Barksdale town	SW	NW	35	48N, 05W	No					
West Route Segment 1	Unnamed	S-06	5001123	Yes	TCSB-1E	0	0	0	0	0	0						Bayfield	Barksdale town	NW	NW	35	48N, 05W	No					
West Route Segment 1	Unnamed	S-07	5001103	Yes	TCSB-2E	0	0	0	0	0	0						Bayfield	Barksdale town	SW	NW	26	48N, 05W	No					
West Route Segment 1	Unnamed	S-08	5001086	Yes	TCSB-3E	0	0	0	0	0	0						Bayfield	Barksdale town	NW	NW	26	48N, 05W	No					
West Route Segment 1	Boyd Creek	S-09	2887000			0	0	0	0	0	0						Bayfield	Barksdale town	SW	SW	23	48N, 05W	No					
West Route Segment 1	Unnamed	S-10	5001014	Yes	TCSB-4E	0	0	0	0	0	0						Bayfield	Barksdale town	NW	SW	23	48N, 05W	No					
West Route Segment 2	Bono Creek	S-11	2886900			0	0	0	0	0	0						Bayfield	Barksdale town	SW	SW	14	48N, 05W	Yes					
West Route Segment 2	Unnamed	S-12	5000981			0	0	0	0	0	0						Bayfield	Barksdale town	SW	SW	14	48N, 05W	No					
West Route Segment 2	Unnamed	S-14	5000925			0	0	0	0	0	0						Bayfield	Barksdale town	NW	SW	14	48N, 05W	No					
West Route Segment 2	Unnamed	S-15	5000916			0	0	0	0	0	0						Bayfield	Barksdale town	NW	NW	14	48N, 05W	No					
West Route Segment 2	Unnamed	S-17	5000871			0	0	0	0	0	0						Bayfield	Washburn town	SE	NE	10	48N, 05W	No					
West Route Segment 2	Thompson Creek	S-18	2886800			0	0	0	0	0	0						Bayfield	Washburn town	SW	NW	11	48N, 05W	Yes					
West Route Segment 2	Sioux River	S-23	2886000			0	0	0	0	0	0						Bayfield	Washburn town	SE	SE	33	49N, 05W	Yes					
West Route Segment 2	Unnamed	S-28	5000645			0	0	0	0	0	0						Bayfield	Washburn town	SE	SE	33	49N, 05W	No					
West Route Segment 2	Unnamed	S-31	5000658			0	0	0	0	0	0						Bayfield	Washburn town	NW NW	NW SW	34	49N, 05W	No					
West Route Segment 3	Unnamed	S-26	5000677	Yes	TCSB-8E	0	0	0	0	0	0						Bayfield	Washburn city	SE	NW	31	49N, 04W	No					
West Route Segment 3	Unnamed	S-27	5000673			0	0	0	0	0	0						Bayfield	Washburn city	SE	NW	31	49N, 04W	No					
West Route Segment 3	Unnamed	S-29	5000666	Yes	TCSB-7E	0	0	0	0	0	0						Bayfield	Washburn city	SE	NW	31	49N, 04W	No					
West Route Segment 3	Sioux River	S-32	2886000			0	0	0	0	0	0						Bayfield	Washburn town	NE	NE	35	49N, 05W	Yes					
West Route Segment 3	Unnamed	S-33	5000643			0	0	0	0	0	0						Bayfield	Washburn town	SE	SE	27	49N, 05W	No					
West Route Segment 4	Unnamed	S-34	5000607			0	0	0	0	0	0						Bayfield	Washburn town	SW	SW	22	49N, 05W	No					
West Route Segment 4	Unnamed	S-35	5000626			0	0	0	0	0	0						Bayfield	Washburn town	NW	SW	22	49N, 05W	No					
West Route Segment 4	Fourmile Creek	S-38	2886200			0	0	0	0	0	0						Bayfield	Washburn town	NW	SW	22	49N, 05W	Yes					
West Route Segment 4	Unnamed	S-40	5000551	Yes	TCSB-1W	0	0	0	0	0	0						Bayfield	Washburn town	NW	NW	22	49N, 05W	No					
West Route Segment 4	Unnamed	S-42	5000543	Yes	TCSB-2W	0	0	0	0	0	0						Bayfield	Washburn town	NE	NW	22	49N, 05W	No					
West Route Segment 4	Unnamed	S-45	5000526			0	0	0	0	0	0						Bayfield	Bayview town	NW	SW	14	49N, 05W	No					
West Route Segment 4	Unnamed	S-51	5000481			0	0	0	0	0	0						Bayfield	Bayview town	NW	NW	2	49N, 05W	No					
West Route Segment 4	Little Sioux River	S-52	2886100			0	0	0	0	0	0						Bayfield	Bayview town	NW	NW	2	49N, 05W	Yes					
West Route Segment 4	Unnamed	S-56	5000388	Yes	TCSB-3W	0	0	0	0	0	0						Bayfield	Bayfield town	NW	SW	24	50N, 05W	No					
West Route Segment 4	Unnamed	S-57	5000373			0	0	0	0	0	0						Bayfield	Bayfield town	SW	NW	24	50N, 05W	No					
West Route Segment 4	Pikes Creek	S-59	2884500			0	0	0	0	0	0						Bayfield	Bayfield town	NW	NW	24	50N, 05W	Yes					
West Route Segment 4	Unnamed	S-62	5000350			0	0	0	0	0	0						Bayfield	Bayfield town	NW	NE	20	50N, 04W	No					
West Route Segment 4	Birch Run	S-63	2884600			0	0	0	0	0	0						Bayfield	Bayfield town	SE	SW	16	50N, 04W	Yes					

RESOURCE					CONSTRUCTION METHOD/ACTIVITY												LOCATION						RESOURCE IMPACT				DNR DOCKET ¹¹	
Route/ Segment	Wetland Type or Waterway Name ¹	Feature Unique ID ²	WBIC Code	Permit Required	Bridge ³	Waterway Impact Activity		Grading on banks (upland) over 10,000 sq. ft. ⁵	Placement Structure/Fill Placement (square feet) ⁶	Plow ⁷ (linear feet)	HDD ⁷ (linear feet)	Wetland Impact Activity					County	Municipality	QQ	Q	Section	Township (N), Range (E/W)	ASNRI	Temporary Fill (square feet)	Permanent Fill (square feet)	Conversion ¹⁰ (square feet)		
						square feet	cubic yards					Matting ⁸ (square feet)	Trench ⁹ (square feet)	Bore Pits (square feet)	Structure # if located in Wetland	Grading (square feet)												
West Route Segment 4	Unnamed	S-64	5000345	Yes	TCSB-15E	0	0	0	0	0	0						Bayfield	Bayfield town	NE	NE	21	50N, 04W	No					
West Route Segment 4	Unnamed	S-66	5000339			0	0	0	0	0	0						Bayfield	Bayfield town	NW	NE	20	50N, 04W	No					
West Route Segment 4	Unnamed	S-67	2885300			0	0	0	0	0	0						Bayfield	Bayfield town	NW	NW	24	50N, 05W	No					
West Route Segment 4	Unnamed	S-68	5000335			0	0	0	0	0	0						Bayfield	Bayfield town	NW	NW	21	50N, 04W	No					
West Route Segment 4	North Pikes Creek	S-69	2885100			0	0	0	0	0	0						Bayfield	Bayfield town	SW	SW	16	50N, 04W	No					
West Route Segment 4	Unnamed	S-70	5000319			0	0	0	0	0	0						Bayfield	Bayfield town	NW	NE	19	50N, 04W	No					
Bypass Line Segment 1	Scrub/shrub, Emergent/wet meadow	W-28		Yes		0	0	0	0	0	0	760.20					Bayfield	Barksdale town	NW	SW	35	48N, 05W	No	760.20		760.20		
Bypass Line Segment 1	Emergent/wet meadow	W-29		Yes		0	0	0	0	0	0	2,719.25					Bayfield	Barksdale town	SW	SW	35	48N, 05W	No	2,719.25				
West Route Segment 1	Forested	W-18				0	0	0	0	0	0	0.00					Bayfield	Barksdale town	NW, SW	NW	23	48N, 05W	No			3,143.20		
West Route Segment 1	Forested	W-21				0	0	0	0	0	0	0.00					Bayfield	Barksdale town	NW	NW	23	48N, 05W	No			4,938.12		
West Route Segment 1	Emergent/wet meadow	W-22		Yes		0	0	0	0	0	0	30,440.79			W3601-103, W3601-104, W3601-105		Bayfield	Barksdale town	NW, SW	NW	23	48N, 05W	No	30,440.79	37.64			
West Route Segment 1	Forested	W-23				0	0	0	0	0	0	0.00					Bayfield	Barksdale town	NW, SW	NW	23	48N, 05W	No			14,734.66		
West Route Segment 1	Forested	W-24				0	0	0	0	0	0	0.00					Bayfield	Barksdale town	SW NW	NW SW	23	48N, 05W	No			5,861.60		
West Route Segment 1	Forested	W-25		Yes		0	0	0	0	0	0	6,602.14			W3601-90		Bayfield	Barksdale town	NW	NW	26	48N, 05W	No	6,602.14	38.42	21,801.64		
West Route Segment 1	Forested	W-26		Yes		0	0	0	0	0	0	2,576.89					Bayfield	Barksdale town	SW, SE NE	NW SW	26	48N, 05W	No	2,576.89		8,515.43		
West Route Segment 1	Forested	W-27		Yes		0	0	0	0	0	0	965.02					Bayfield	Barksdale town	NE, NW,	NW	35	48N, 05W	No	965.02		6,628.01		
West Route Segment 1	Scrub/shrub, Emergent/wet meadow	W-28		Yes		0	0	0	0	0	0	3,350.61					Bayfield	Barksdale town	NW	SW	35	48N, 05W	No	3,350.61		5,222.62		
West Route Segment 1	Emergent/wet meadow	W-29		Yes		0	0	0	0	0	0	5,783.63			W3601-64		Bayfield	Barksdale town	SW	SW	35	48N, 05W	No	5,783.63	3.83			
West Route Segment 1	Emergent/wet meadow	W-30		Yes		0	0	0	0	0	0	12,625.38			W3601-58		Bayfield	Eileen town	NW, SW	NW	2	47N, 05W	No	12,625.38	12.55			
West Route Segment 4	Forested, Scrub/shrub	W-01		Yes		0	0	0	0	0	0	12,670.63			WXXX-216		Bayfield	Bayfield town	NE	NW	20	50N, 04W	No	12,670.63	9.50	19,001.49		
West Route Segment 4	Scrub/shrub, Emergent/wet meadow	W-02		Yes		0	0	0	0	0	0	4,351.83					Bayfield	Bayfield town	NW	NW	24	50N, 05W	No	4,351.83		7,191.07		
West Route Segment 4	Forested	W-04		Yes		0	0	0	0	0	0	4,790.22					Bayfield	Bayview town	NW NE	NW NE	2 3	49N, 05W	No	4,790.22		7,984.40		
West Route Segment 4	Forested	W-05		Yes		0	0	0	0	0	0	14,911.48					Bayfield	Bayview town	NW SE	SW NE	2 3	49N, 05W	No	14,911.48		24,885.44		
																						Total (sq. ft.)		102,548.08	101.94	130,667.88		
																						Total (acre)		2.35	0.00	3.00		

Notes:

¹ For wetlands, state the wetland type using the Eggars and Reed Classification system. For waterways, indicate where water flows (e.g. UNT to Silver Creek) (UNT = unnamed tributary). Include all waterways mapped in the DNR Surface Water Data Viewer webtool that cross the project path.

² Insert the code or other reference used in application (e.g. W-3, S-27)

³ Indicate the number of bridges needed

⁴ For underground line placement only: If the waterway will be dredged, indicate the area (length by width) and volume (length by width by depth) of bed material to be removed and backfilled (temporary dredge)

⁵ Only complete this column if the upland banks of the waterway will be graded in excess of 10,000 sq. ft., and if the project is not located in Milwaukee County, if the project will not require a local grading/shoreland permit, and if the project will not require a WDNR construction stormwater permit

⁶ If a permanent structure or permanent fill will be placed in wetland or waterway (i.e. pole structures, padmount, substation, power plant, etc.), incidate the area (length by width) of permanent fill

⁷ For underground line placement only

⁸ If construction matting (i.e. timber, composite, etc.) will be placed in wetland for vehicle/equipment access or under soil stockpiles, or on the waterway bed for access, indicate the area (length by width) of matting to be placed in wetland (temporary fill) or waterway

⁹ For underground line placement only. If the wetland will be trenched, indicate the area (length by width) of soil to be removed and backfilled (temporary fill).

¹⁰ Conversion impact refers to vegetative clearing of forested and/or shrub wetlands, resulting in an herbaceous wetland, for the purposes of construction

¹¹ Assigned and to be completed by the DNR

(please submit in excel format)

Table 9

WDNR Waterway/Wetland Environmental Inventory

DOCKET NO. 4220-CE-182
DNR Table 9 - DNR Waterway/Wetland Environmental Inventory Table
Route: East Route

Segment	Feature Unique ID ¹	Feature Type, Name and Designation	Resource Description	Survey Technique ²	Waterway Characteristics	Wetland Characteristics
Bayfield County						
Fish Creek Substation						
County Road G and Terwilliger Road						
East Route Segment 1	W-30	Wetland	Emergent/wet meadow	N		
East Route Segment 1	W-29	Wetland	Emergent/wet meadow	N		
East Route Segment 1	S-01	Waterway	Unnamed	N		
East Route Segment 1	W-28	Wetland	Scrub/shrub, Emergent/wet meadow	N		
Cherryville Road						
East Route Segment 1	S-02	Waterway	Whittlesey Creek	N		
East Route Segment 1	S-03	Waterway	Unnamed	N		
East Route Segment 1	W-27	Wetland	Forested	N		
East Route Segment 1	S-06	Waterway	Unnamed	N		
East Ondossagon Road						
East Route Segment 1	W-26	Wetland	Forested	N		
East Route Segment 1	S-07	Waterway	Unnamed	N		
East Route Segment 1	W-25	Wetland	Forested	N		
East Route Segment 1	S-08	Waterway	Unnamed	N		
East Route Segment 1	S-09	Waterway	Boyd Creek	N		
East Route Segment 1	S-10	Waterway	Unnamed	N		
East Route Segment 1	W-24	Wetland	Forested	N		
East Route Segment 1	W-23	Wetland	Forested	N		
East Route Segment 1	W-22	Wetland	Emergent/wet meadow	N		
East Route Segment 1	W-18	Wetland	Forested	N		
East Route Segment 1	W-21	Wetland	Forested	N		
East Route Segment 2	W-19	Wetland	Forested, Scrub/shrub	N		
East Route Segment 2	W-20	Wetland	Forested	N		
Nolander Road						
East Route Segment 2	W-31	Wetland	Forested	N		
Bjork Road						
East Route Segment 2	S-13	Waterway	Bono Creek	N		
East Route Segment 2	S-16	Waterway	Unnamed	N		
Wedal Road						
Engoe Road						
Nevers Road						
East Route Segment 2	W-17	Wetland	Forested	N		
East Route Segment 2	S-19	Waterway	Unnamed	N		
Wannebo Road						
East Route Segment 2	W-16	Wetland	Forested	N		
Bourgo Road						
East Route Segment 2	S-22	Waterway	Thompson Creek	N		
East Route Segment 2	S-24	Waterway	Unnamed	N		
East Route Segment 2	S-25	Waterway	Unnamed	N		
East Route Segment 2	S-30	Waterway	Unnamed	N		
East Route Segment 2	S-29	Waterway	Unnamed	N		
East Route Segment 2	S-26	Waterway	Unnamed	N		
East Route Segment 2	S-27	Waterway	Unnamed	N		
County Road C						
East Route Segment 3	S-27	Waterway	Unnamed	N		
East Route Segment 3	S-39	Waterway	Unnamed	N		
Peacy Road						
East Route Segment 3	W-14	Wetland	Forested	N		
East Route Segment 3	W-13	Wetland	Forested, Scrub/shrub	N		
East Route Segment 3	W-12	Wetland	Emergent/wet meadow	N		
Maki Road						
Johnson Leino Road						
East Route Segment 3	W-11	Wetland	Forested	N		
East Route Segment 3	S-41	Waterway	Unnamed	N		
East Route Segment 3	W-10	Wetland	Forested	N		
East Route Segment 3	W-09	Wetland	Forested	N		
East Route Segment 3	S-44	Waterway	Sioux River	N		
East Route Segment 3	W-08	Wetland	Scrub/shrub, Emergent/wet meadow	N		
Friendly Valley Road						
East Route Segment 3	S-46	Waterway	Unnamed	N		

Segment	Feature Unique ID ¹	Feature Type, Name and Designation	Resource Description	Survey Technique ²	Waterway Characteristics	Wetland Characteristics
Smith Fire Lane						
East Route Segment 3	S-48	Waterway	Unnamed	N		
East Route Segment 3	W-06	Wetland	Forested	N		
East Route Segment 3	S-47	Waterway	Unnamed	N		
East Route Segment 3	W-07	Wetland	Forested	N		
East Route Segment 3	S-49	Waterway	Onion River	N		
East Route Segment 3	S-53	Waterway	Unnamed	N		
Whiting Road						
East Route Segment 3	S-54	Waterway	Unnamed	N		
East Route Segment 3	S-55	Waterway	Unnamed	N		
East Route Segment 3	S-60	Waterway	Pikes Creek	N		
East Route Segment 3	S-58	Waterway	North Pikes Creek	N		
East Route Segment 3	S-61	Waterway	Birch Run	N		
East Route Segment 3	S-64	Waterway	Unnamed	N		
Star Route Road						
Pikes Creek Substation						
Fish Creek Substation						
County Road G and Terwilliger Road						
Bypass Line Segment 1	W-29	Wetland	Emergent/wet meadow	N		
Bypass Line Segment 1	S-01	Waterway	Unnamed	N		
Bypass Line Segment 1	W-28	Wetland	Scrub/shrub, Emergent/wet meadow	N		
Cherryville Road						
Bypass Line Segment 1	S-02	Waterway	Whittlesey Creek	N		
Bypass Line Segment 1	S-05	Waterway	Unnamed	N		
Bypass Line Segment 1	S-04	Waterway	Unnamed	N		
Ondossagon Road						
Lutkie Road						
Bypass Line Segment 1	S-07	Waterway	Unnamed	N		
Bypass Line Segment 1	S-08	Waterway	Unnamed	N		
Cozy Corner Road						
Bypass Line Segment 1	S-09	Waterway	Boyd Creek	N		
Sig Eid Road						
Bypass Line Segment 1	S-10	Waterway	Unnamed	N		
Ondossagon Road and Nolander Road						
Bypass Line Segment 2	S-12	Waterway	Unnamed	N		
Bypass Line Segment 2	S-11	Waterway	Bono Creek	N		
Bypass Line Segment 2	S-14	Waterway	Unnamed	N		
Wedal Road						
Bypass Line Segment 2	S-15	Waterway	Unnamed	N		
Engoe Road						
Nevers Road						
Bypass Line Segment 2	S-17	Waterway	Unnamed	N		
Bypass Line Segment 2	S-18	Waterway	Thompson Creek	N		
Wannebo Road						
Ondossagon Road						
Bypass Line Segment 2	S-20	Waterway	Unnamed	N		
McKinley Road						
Potters Farm Road						
Bypass Line Segment 2	S-21	Waterway	Unnamed	N		
Bypass Line Segment 2	W-15	Wetland	Emergent/wet meadow	N		
Bypass Line Segment 2	S-24	Waterway	Unnamed	N		
Scholl Road						
McKinley Road						
County Road C						
Big Rock Road and County Road C						
Bypass Line Segment 3	S-29	Waterway	Unnamed	N		
Bypass Line Segment 3	S-26	Waterway	Unnamed	N		
Big Rock Road and County Road C						
Gasperini Road						
Bypass Line Segment 4	S-36	Waterway	Unnamed	N		
Maki Road						
Big Rock Road						
Bypass Line Segment 4	S-37	Waterway	Sioux River	N		
South Niemisto Road						
Mattson Road						
Bypass Line Segment 4	S-43	Waterway	Unnamed	N		
North Niemisto Road						
Van Stone Road/Little Sioux Road						
Bypass Line Segment 4	S-50	Waterway	Unnamed	N		
Bypass Line Segment 4	S-52	Waterway	Little Sioux River	N		
Jammer Hill Road						
Whiting Road						

Segment	Feature Unique ID ¹	Feature Type, Name and Designation	Resource Description	Survey Technique ²	Waterway Characteristics	Wetland Characteristics
Bypass Line Segment 4	S-56	Waterway	Unnamed	N		
Bypass Line Segment 4	S-57	Waterway	Unnamed	N		
Bypass Line Segment 4	S-59	Waterway	Pikes Creek	N		
Bypass Line Segment 4	W-03	Wetland	Scrub/shrub, Emergent/wet meadow	N		
Star Route Road						
Bypass Line Segment 4	W-02	Wetland	Scrub/shrub, Emergent/wet meadow	N		
Bypass Line Segment 4	S-67	Waterway	Unnamed	N		
Echo Valley Road						
Muneson Road						
Bypass Line Segment 4	S-70	Waterway	Unnamed	N		
Old Corny Road						
Wichlidal Road						
Bypass Line Segment 4	S-66	Waterway	Unnamed	N		
Gotchling Road						
Bypass Line Segment 4	S-68	Waterway	Unnamed	N		
Bypass Line Segment 4	S-69	Waterway	North Pikes Creek	N		
Bypass Line Segment 4	S-65	Waterway	Unnamed	N		
Bypass Line Segment 4	S-64	Waterway	Unnamed	N		
Pikes Creek Substation						

NOTES (the applicant can add additional footnotes for additional explanation):

¹ Insert the code or other reference used in application (e.g. Wetland 1, Stream 1)

² Delineation Method: A=aerial photo inspection (offsite delineation); D=1987 Manual delineation (onsite delineation); C=field-checked aerial photo (offsite and field observations); N=not surveyed.

DOCKET NO. 4220-CE-182
 DNR Table 9 - DNR Waterway/Wetland Environmental Inventory Table
 Route: West Route

Segment	Feature Unique ID ¹	Feature Type, Name and Designation	Resource Description	Survey Technique ²	Waterway Characteristics	Wetland Characteristics
Bayfield County						
County Road G and Terwilliger Road						
Fish Creek Substation						
West Route Segment 1	W-30	Wetland	Emergent/wet meadow	N		
West Route Segment 1	W-29	Wetland	Emergent/wet meadow	N		
West Route Segment 1	S-01	Waterway	Unnamed	N		
West Route Segment 1	W-28	Wetland	Scrub/shrub, Emergent/wet meadow	N		
Cherryville Road						
West Route Segment 1	S-02	Waterway	Whittlesey Creek	N		
West Route Segment 1	S-03	Waterway	Unnamed	N		
West Route Segment 1	W-27	Wetland	Forested	N		
West Route Segment 1	S-06	Waterway	Unnamed	N		
East Ondossagon Road						
West Route Segment 1	W-26	Wetland	Forested	N		
West Route Segment 1	S-07	Waterway	Unnamed	N		
West Route Segment 1	W-25	Wetland	Forested	N		
West Route Segment 1	S-08	Waterway	Unnamed	N		
West Route Segment 1	S-09	Waterway	Boyd Creek	N		
West Route Segment 1	S-10	Waterway	Unnamed	N		
West Route Segment 1	W-24	Wetland	Forested	N		
West Route Segment 1	W-23	Wetland	Forested	N		
West Route Segment 1	W-22	Wetland	Emergent/wet meadow	N		
West Route Segment 1	W-18	Wetland	Forested	N		
West Route Segment 1	W-21	Wetland	Forested	N		
Nolander Road						
West Route Segment 2	S-12	Waterway	Unnamed	N		
West Route Segment 2	S-11	Waterway	Bono Creek	N		
West Route Segment 2	S-14	Waterway	Unnamed	N		
Wedal Road						
West Route Segment 2	S-15	Waterway	Unnamed	N		
Engoe Road						
Nevers Road						
West Route Segment 2	S-17	Waterway	Unnamed	N		
West Route Segment 2	S-18	Waterway	Thompson Creek	N		
Wannebo Road						
Overby Road						
Church Corner Road						
Lucia Road						
West Route Segment 2	S-23	Waterway	Sioux River	N		
West Route Segment 2	S-28	Waterway	Unnamed	N		
West Route Segment 2	S-31	Waterway	Unnamed	N		
Paulson Road						
West Route Segment 2	S-31	Waterway	Unnamed	N		
South Maple Hill Road						
West Route Segment 4	S-34	Waterway	Unnamed	N		
West Route Segment 4	S-35	Waterway	Unnamed	N		
West Route Segment 4	S-38	Waterway	Fourmile Creek	N		
West Route Segment 4	S-40	Waterway	Unnamed	N		
West Route Segment 4	S-42	Waterway	Unnamed	N		
Friendly Valley Road						
West Route Segment 4	S-45	Waterway	Unnamed	N		
West Route Segment 4	W-05	Wetland	Forested	N		
West Route Segment 4	W-04	Wetland	Forested	N		
West Route Segment 4	S-51	Waterway	Unnamed	N		
West Route Segment 4	S-52	Waterway	Little Sioux River	N		
Little Sioux Road						
Jammer Hill Road						
Whiting Road						
West Route Segment 4	S-56	Waterway	Unnamed	N		
West Route Segment 4	S-57	Waterway	Unnamed	N		
Jammer Hill Road						
West Route Segment 4	S-59	Waterway	Pikes Creek	N		
Star Route Road						
West Route Segment 4	W-02	Wetland	Scrub/shrub, Emergent/wet meadow	N		

DOCKET NO. 4220-CE-182
DNR Table 9 - DNR Waterway/Wetland Environmental Inventory Table
Route: West Route

Segment	Feature Unique ID ¹	Feature Type, Name and Designation	Resource Description	Survey Technique ²	Waterway Characteristics	Wetland Characteristics
West Route Segment 4	S-67	Waterway	Unnamed	N		
Echo Valley Road						
Star Route Road						
Pikes Creek Substation						
West Route Segment 4	S-70	Waterway	Unnamed	N		
West Route Segment 4	W-01	Wetland	Forested, Scrub/shrub	N		
West Route Segment 4	S-62	Waterway	Unnamed	N		
West Route Segment 4	S-66	Waterway	Unnamed	N		
West Route Segment 4	S-68	Waterway	Unnamed	N		
West Route Segment 4	S-69	Waterway	North Pikes Creek	N		
West Route Segment 4	S-63	Waterway	Birch Run	N		
West Route Segment 4	S-64	Waterway	Unnamed	N		
County Road C						
West Route Segment 3	S-26	Waterway	Unnamed	N		
West Route Segment 3	S-29	Waterway	Unnamed	N		
Arneson Road						
County Road C						
West Route Segment 3	S-32	Waterway	Sioux River	N		
South Maple Hill Road						
County Road C						
West Route Segment 3	S-33	Waterway	Unnamed	N		
Cook Road						
Old C Road						
County Road G and Terwilliger Road						
Fish Creek Substation						
Bypass Line Segment 1	W-29	Wetland	Emergent/wet meadow	N		
Bypass Line Segment 1	S-01	Waterway	Unnamed	N		
Bypass Line Segment 1	W-28	Wetland	Scrub/shrub, Emergent/wet meadow	N		
Cherryville Road						
Bypass Line Segment 1	S-02	Waterway	Whittlesey Creek	N		
Bypass Line Segment 1	S-05	Waterway	Unnamed	N		
Bypass Line Segment 1	S-04	Waterway	Unnamed	N		
Ondossagon Road						
Lutkie Road						
Bypass Line Segment 1	S-07	Waterway	Unnamed	N		
Bypass Line Segment 1	S-08	Waterway	Unnamed	N		
Cozy Corner Road						
Bypass Line Segment 1	S-09	Waterway	Boyd Creek	N		
Sig Eid Road						
Bypass Line Segment 1	S-10	Waterway	Unnamed	N		
Ondossagon Road and Nolander Road						
Pikes Creek Substation						
Star Route Road						

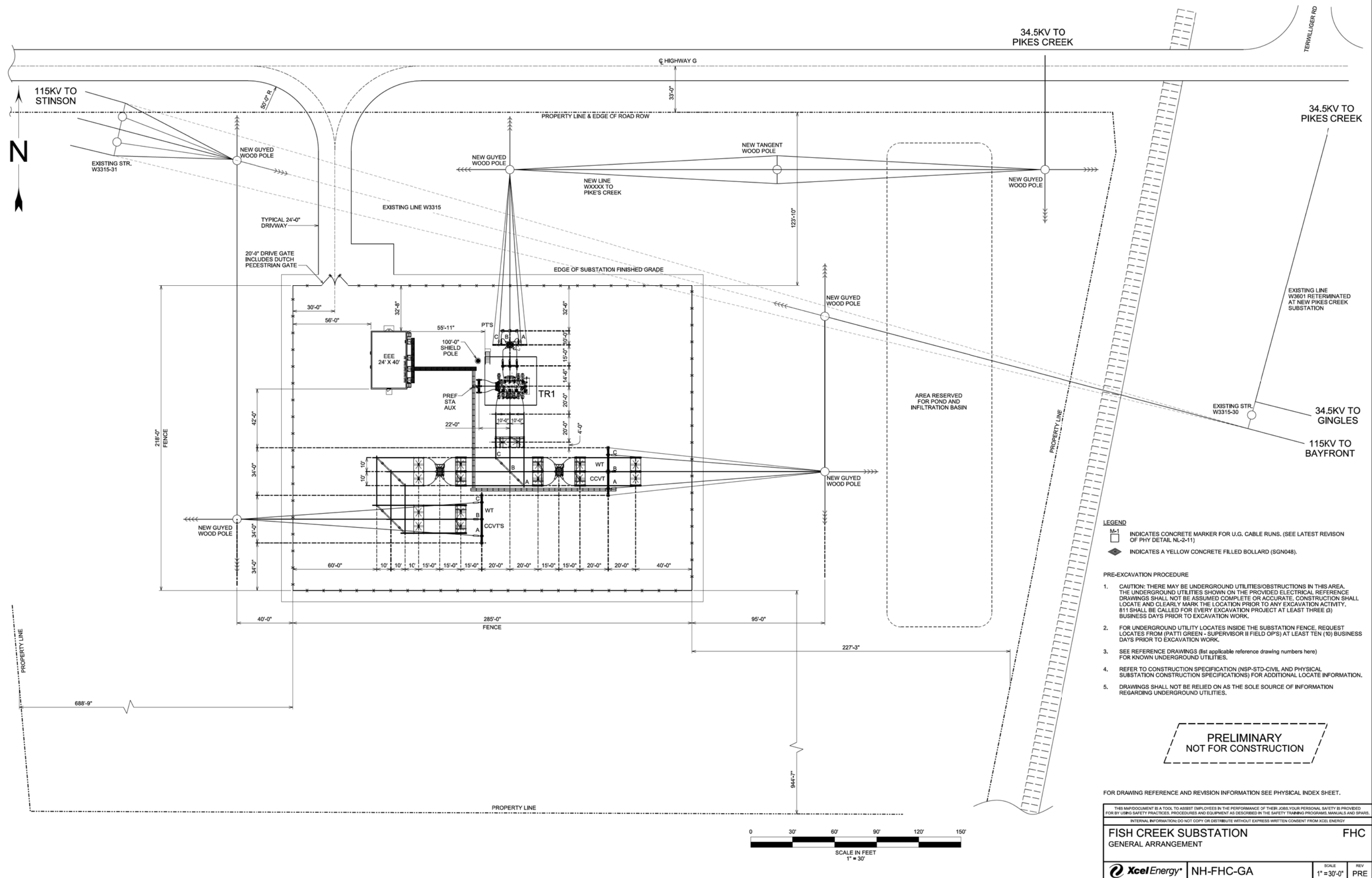
NOTES (the applicant can add additional footnotes for additional explanation):
¹ Insert the code or other reference used in application (e.g. Wetland 1, Stream 1)
² Delineation Method: A=aerial photo inspection (offsite delineation); D=1987 Manual delineation (onsite delineation); C=field-checked aerial photo (offsite and field observations); N=not surveyed.

APPENDIX C
TRANSMISSION FACILITIES

SUBSTATION FIGURES

Figure 1

Fish Creek Substation



LEGEND

M-1 INDICATES CONCRETE MARKER FOR U.G. CABLE RUNS. (SEE LATEST REVISION OF PHY DETAIL NL-2-11)

INDICATES A YELLOW CONCRETE FILLED BOLLARD (SGN048).

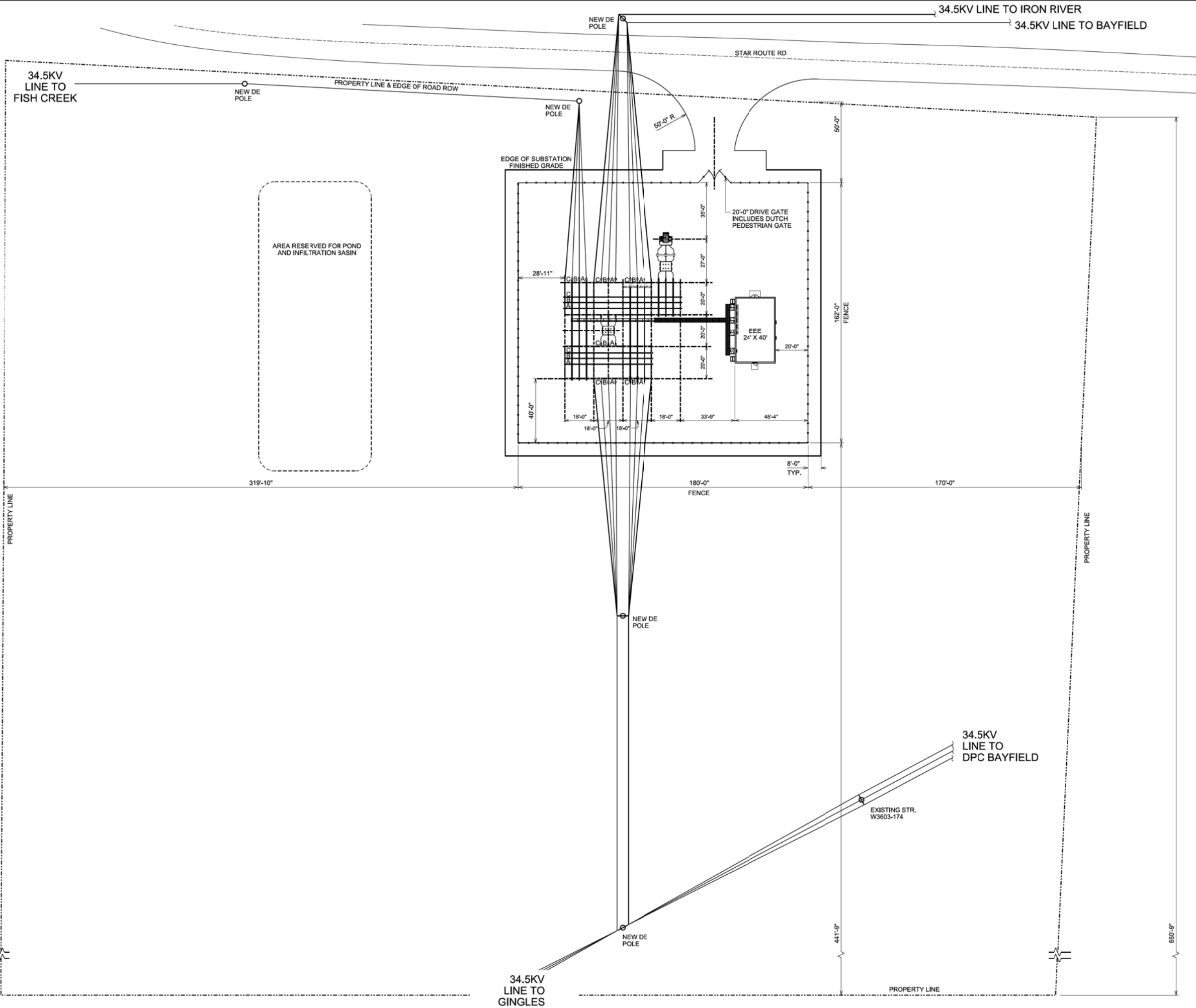
- PRE-EXCAVATION PROCEDURE**
- CAUTION: THERE MAY BE UNDERGROUND UTILITIES/OBSTRUCTIONS IN THIS AREA. THE UNDERGROUND UTILITIES SHOWN ON THE PROVIDED ELECTRICAL REFERENCE DRAWINGS SHALL NOT BE ASSUMED COMPLETE OR ACCURATE. CONSTRUCTION SHALL LOCATE AND CLEARLY MARK THE LOCATION PRIOR TO ANY EXCAVATION ACTIVITY. 811 SHALL BE CALLED FOR EVERY EXCAVATION PROJECT AT LEAST THREE (3) BUSINESS DAYS PRIOR TO EXCAVATION WORK.
 - FOR UNDERGROUND UTILITY LOCATES INSIDE THE SUBSTATION FENCE, REQUEST LOCATES FROM (PATTI GREEN - SUPERVISOR II FIELD OP'S) AT LEAST TEN (10) BUSINESS DAYS PRIOR TO EXCAVATION WORK.
 - SEE REFERENCE DRAWINGS (list applicable reference drawing numbers here) FOR KNOWN UNDERGROUND UTILITIES.
 - REFER TO CONSTRUCTION SPECIFICATION (NSP-STD-CIVIL AND PHYSICAL SUBSTATION CONSTRUCTION SPECIFICATIONS) FOR ADDITIONAL LOCATE INFORMATION.
 - DRAWINGS SHALL NOT BE RELIED ON AS THE SOLE SOURCE OF INFORMATION REGARDING UNDERGROUND UTILITIES.

**PRELIMINARY
NOT FOR CONSTRUCTION**

SUBSTATION FIGURES

Figure 2

Pikes Creek Substation



PRELIMINARY
NOT FOR CONSTRUCTION

- LEGEND
- M-1 INDICATES CONCRETE MARKER FOR U.G. CABLE RUNS. (SEE LATEST REVISION OF PHY DETAIL NL-2-11)
 - INDICATES A YELLOW CONCRETE FILLED BOLLARD (SGN048).

- PRE-EXCAVATION PROCEDURE
- CAUTION: THERE MAY BE UNDERGROUND UTILITIES/OBSTRUCTIONS IN THIS AREA. THE UNDERGROUND UTILITIES SHOWN ON THE PROVIDED ELECTRICAL REFERENCE DRAWINGS SHALL NOT BE ASSUMED COMPLETE OR ACCURATE. CONSTRUCTION SHALL LOCATE AND CLEARLY MARK THE LOCATION PRIOR TO ANY EXCAVATION ACTIVITY. 811 SHALL BE CALLED FOR EVERY EXCAVATION PROJECT AT LEAST THREE (3) BUSINESS DAYS PRIOR TO EXCAVATION WORK.
 - FOR UNDERGROUND UTILITY LOCATES INSIDE THE SUBSTATION FENCE, REQUEST LOCATES FROM (PATTI GREEN - SUPERVISOR II FIELD OPS) AT LEAST TEN (10) BUSINESS DAYS PRIOR TO EXCAVATION WORK.
 - SEE REFERENCE DRAWINGS (list applicable reference drawing numbers here) FOR KNOWN UNDERGROUND UTILITIES.
 - REFER TO CONSTRUCTION SPECIFICATION (NSP-STD-CIVIL AND PHYSICAL SUBSTATION CONSTRUCTION SPECIFICATIONS) FOR ADDITIONAL LOCATE INFORMATION.
 - DRAWINGS SHALL NOT BE RELIED ON AS THE SOLE SOURCE OF INFORMATION REGARDING UNDERGROUND UTILITIES.



FOR DRAWING REFERENCE AND REVISION INFORMATION SEE PHYSICAL INDEX SHEET.
THIS MAP/DOCUMENT IS A TOOL TO ASSIST EMPLOYEES IN THE PERFORMANCE OF THEIR JOBS. YOUR PERSONAL SAFETY IS PROVIDED FOR BY USING SAFETY PRACTICES, PROCEDURES AND EQUIPMENT AS DESCRIBED IN THE SAFETY TRAINING PROGRAMS, MANUALS AND SPARS.
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PIKES CREEK SUBSTATION
GENERAL ARRANGEMENT

PKC

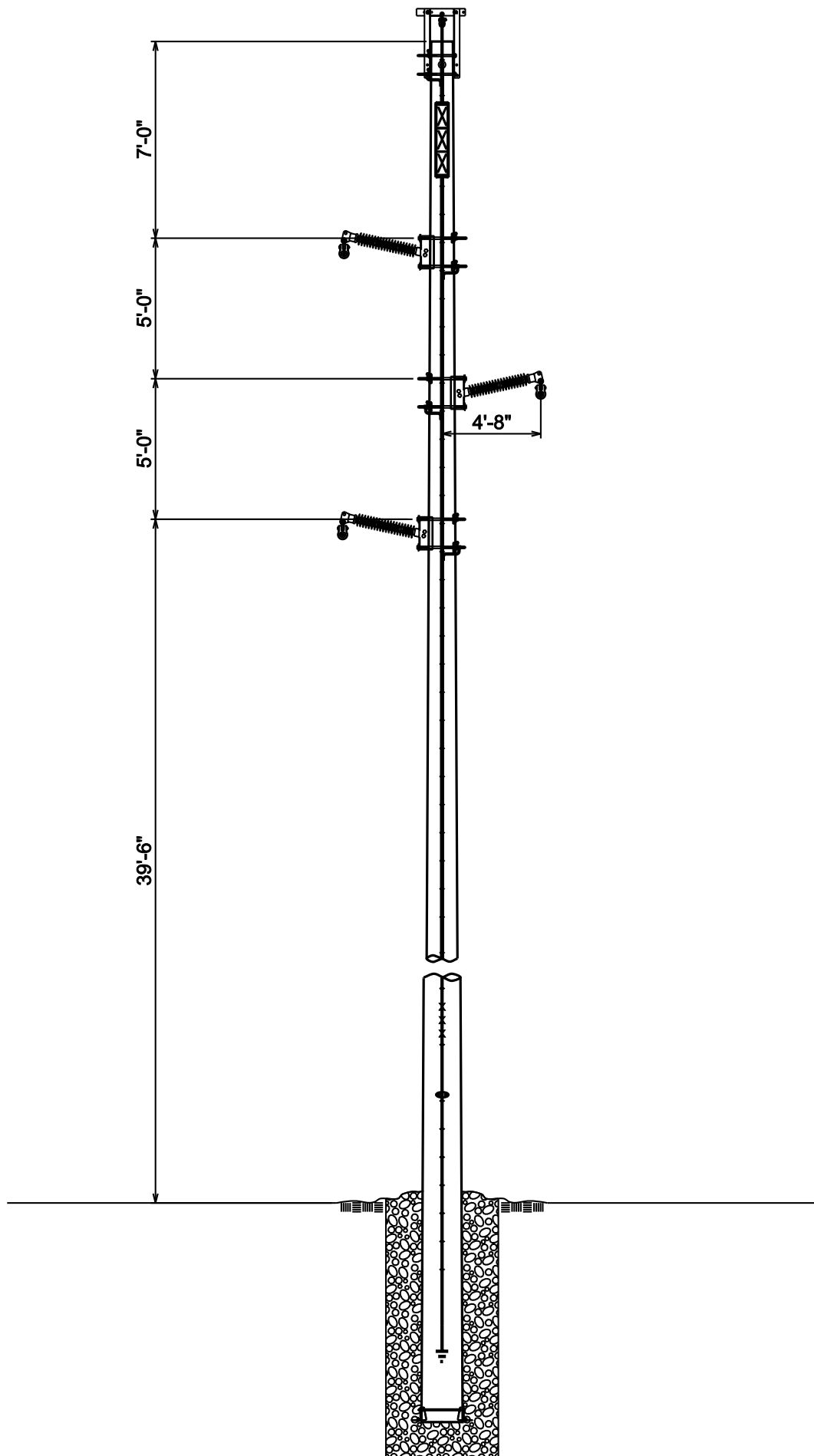
Xcel Energy NH-PKC-GA

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TRANSMISSION FIGURES

Figure 1

Single-Circuit Structure Drawing

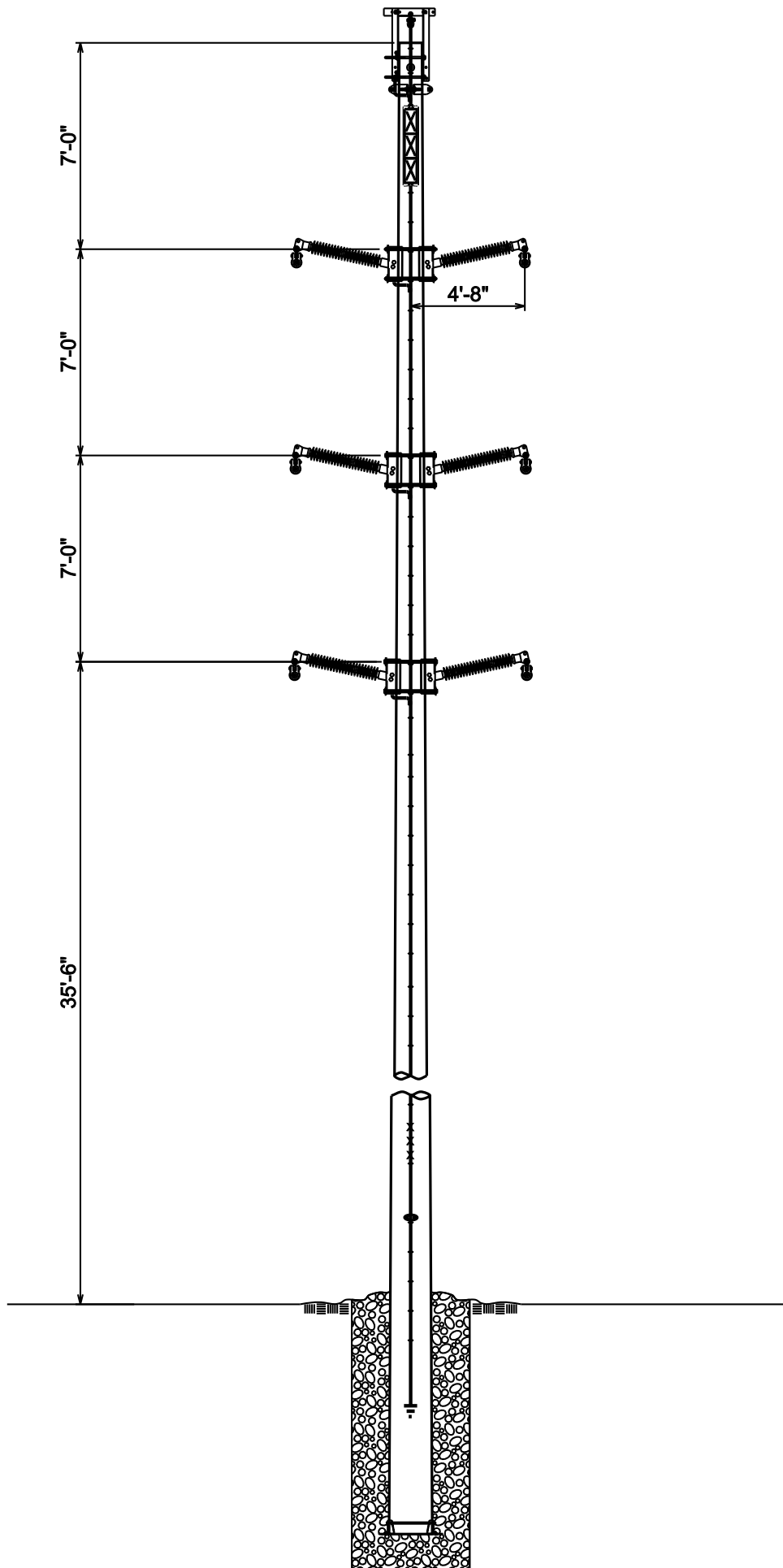


ELEVATION VIEW
TYPICAL 65' POLE

TRANSMISSION FIGURES

Figure 2

Double-Circuit Structure Drawing



ELEVATION VIEW
TYPICAL 65' POLE

APPENDIX D
TRANSMISSION STUDY



Bayfield Peninsula System Assessment

Jason Espeseth, P.E. - MN

November 17, 2017

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1.0 Executive Summary

This report represents the results of a reliability study for the electrical transmission network in the Bayfield Peninsula area of northern Wisconsin owned by Northern States Power Company-Wisconsin (NSPW or Company). This study reviewed the capability of the existing 34.5 kV transmission system to serve the current and future load on the Bayfield Peninsula. The existing 34.5 kV system is currently being operated as two radial lines that form a loop around the Bayfield Peninsula, with a normally-open switch located just east of the Cornucopia substation. One of the two radial lines starts at the Gingles substation in Ashland, WI and the other starts at the Iron River substation, located north of Iron River, WI. *See* Figure 2.1. Due to the current radial nature, local geography, the age, and long length and exposure of the 34.5 kV transmission system lines in the Bayfield Peninsula, the area is susceptible to frequent, and occasionally long outages. These outages occur because there are no other lines in the area from which the load can be restored or temporarily served.

This engineering study determined that the existing 34.5 kV system cannot adequately serve the current or future load during peak conditions, and improvements are necessary to address the situation. It is recommended that the Company rebuild a portion of the existing 34.5 kV line and build a new 34.5 kV single circuit line to bisect the existing loop. These components allow service with adequate voltage levels to all substations on the Bayfield Peninsula during N-1 conditions on the transmission system, now and in the future. An N-1 condition is when any one transmission element (for example a segment of 34.5 kV line) is not operational, putting the system into a contingency situation. The new 34.5 kV line will require (1) a new 115/34.5 kV substation on the Company's Bay Front – Iron River 115 kV transmission line and (2) a new 34.5 kV breaker station near the town of Bayfield on the existing 34.5 kV line. An emergency tie between the new and old 34.5 kV transmission lines on the east side of the Bayfield Peninsula is needed to serve the peninsula area load under contingency and maintenance situations. The recommended project will serve the projected load in the study area for the foreseeable future and provide flexibility for serving load beyond expected growth.

While there were numerous options studied, the preferred option, Option 4, includes the following facilities:

- New 34.5 kV line between Fish Creek Substation and Pikes Creek Substation, built to 69 kV standards
- New emergency 34.5 kV tie line between the new 34.5 kV circuit and existing Bayfield – Washburn 34.5 kV line
- New 115/34.5 kV substation on Iron River – Bay Front 115 kV line (Fish Creek Substation)
- New 34.5 kV breaker substation on the 34.5 kV line near Bayfield (Pikes Creek Substation)
- Add a 3 MVAR capacitor bank at Pikes Creek Substation (room for two banks)
- Rebuild existing Cornucopia – Bayfield Tap 34.5 kV line to 69 kV standards
 - This will occur after the new 34.5 kV circuit is installed
- Rebuild Iron River – Herbster 34.5 kV line to 69 kV standards
 - This will occur after the new 34.5 kV circuit is installed

Figure 1.1 shows a system one-line of the new system configuration after the construction of the preferred option.

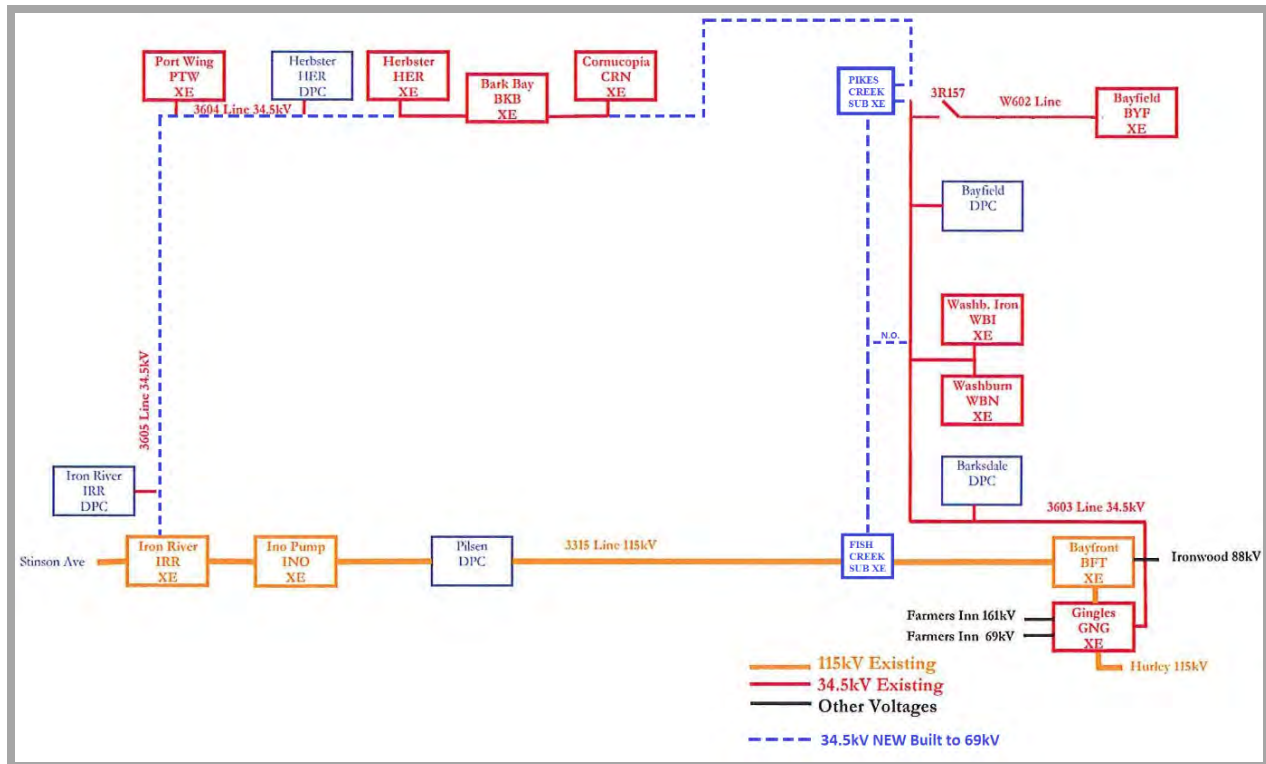


Figure 1.1 System One-line of Preferred Option

The preferred option offers the best overall results with respect to system performance (system intact, contingent loadings, and voltages), practicality (logistics of construction and operation) and price. Additionally, Option 4 is a modular approach that includes options for serving load if growth on the Bayfield Peninsula occurs faster than expected and would be installed when necessary. Potential future system modifications, which are not currently planned for implementation, could include¹:

- Installing a second capacitor bank at the Pikes Creek Substation;
- Installing static VAR compensator (SVC) or static synchronous compensator (STATCOM) at Pikes Creek Substation;
- Converting the system from 34.5 kV to 69 kV operation by replacing transformers at the Cornucopia, DPC Herbster, Herbster, Port Wing, Oulu, and Iron River substations. These transformers are load serving and will likely need to be replaced in the future, at which time dual high side transformers could be installed, thus making the conversion to 69 kV straightforward if and when necessary. Additionally, the transformer at the new Fish Creek Substation would need to be replaced and a transformer added at the new Pikes Creek Substation.

The capacitive devices listed above are not suitable as standalone project options because the transmission system is weak and the capacitive devices alone do not provide enough voltage support or reliability benefit. If load grows faster than expected, these future capacitive devices, combined

¹ Future modifications outlined are conceptual and not planned. They are called out to show theoretical system improvements after the current study need(s) is addressed and if load growth is accelerated beyond what was used for the purpose of this study. If any of these system improvements are deemed necessary, the Company would seek any necessary regulatory or permitting approvals.

with the preferred option, would then be able to provide additional support to the area. If significant load growth occurs², which is not expected, the conversion from 34.5 kV to 69 kV is the best long term solution. If load growth in the area occurs slower than expected, the preferred plan will last through the foreseeable future load growth included in the planning models. Even with slow or no load growth, the preferred plan is still needed as the current system is radial and outages (unplanned or planned for maintenance outages) cause complete loss of power to customers.

2.0 Introduction

This report represents the results of a reliability study for the electrical transmission network in the Bayfield Peninsula area of northern Wisconsin. This study reviewed the capability of the existing 34.5 kV transmission system to serve the current and future load on the Bayfield Peninsula. The existing 34.5 kV system consists of two radial lines that form a loop around the peninsula from the Gingles substation in Ashland, WI to the Iron River Substation north of Iron River, WI. Figure 2.1 shows the current transmission system supporting the Bayfield Peninsula. Although the 34.5 kV lines in the Bayfield Peninsula were originally built to function as a closed loop, they are currently being operated as two radial lines with an open switch near Cornucopia (meaning that power does not flow around the entire loop; it stops flowing at the open switch) because of low voltage concerns if the switch were to be closed. Due to the radial nature of the lines in the peninsula resulting from the open switch, this area is more susceptible to more frequent and potentially longer outages than other areas of the Company's service territory. The outage history for the last seven years is included in Appendix B. In addition, maintenance on this line is very difficult because there is no alternate source of power to serve customers when line outages are required for maintenance repairs. The goal of this study is to analyze options for addressing these problems.

² No future commercial or industrial loads that would have impact on otherwise normal load projections were identified at the time of this study.

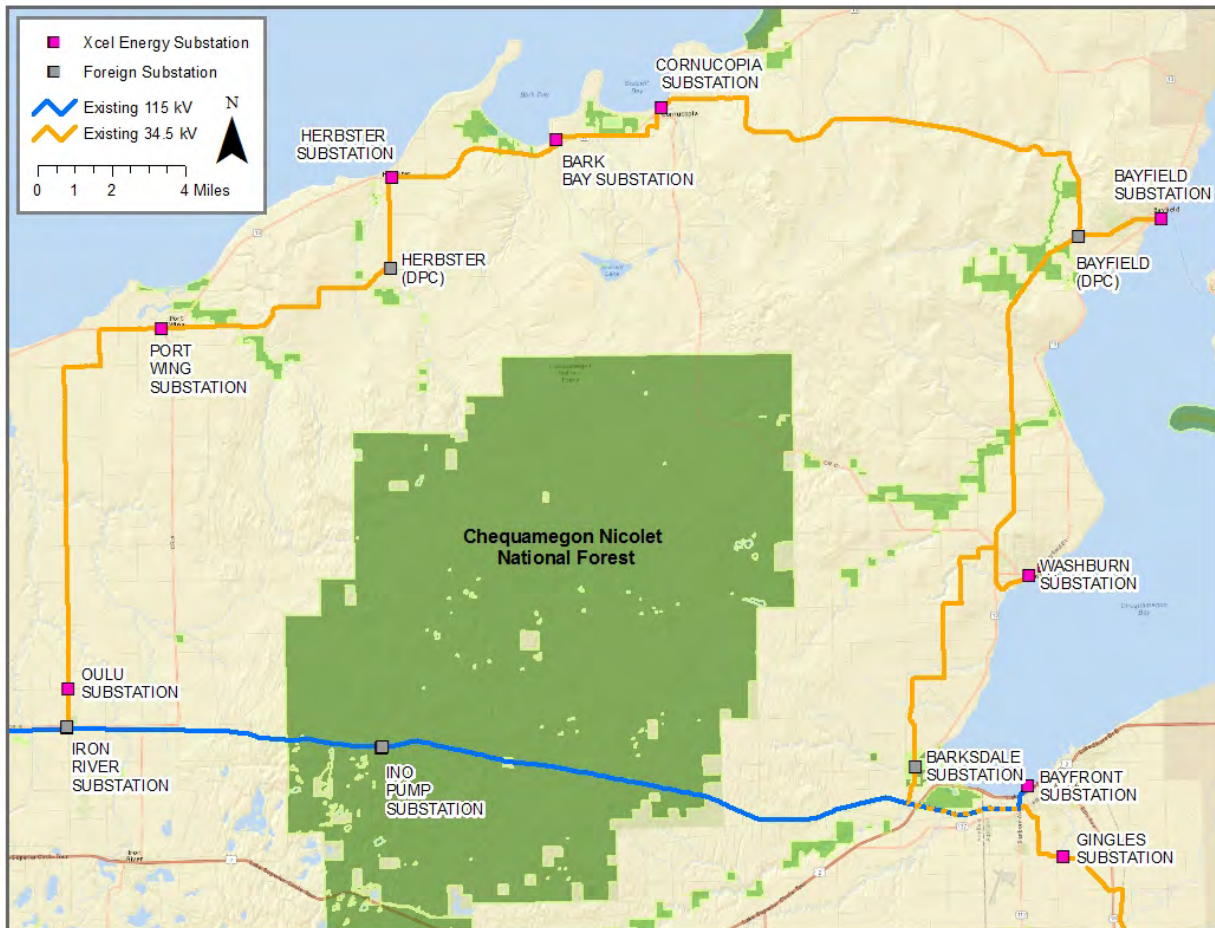


Figure 2.1 Map of the Bayfield Peninsula

2.1 Project History

The Bayfield Peninsula project, also known as the “Bayfield Loop Project,” was in the planning phase until 2013 when it was presented to the public. During the summer of 2013, public meetings were held in Bayfield, WI and Ashland, WI to introduce the project need, review potential route options, and seek public comments. The initial proposal was for construction of a new 115 kV transmission line from a new Fish Creek Substation near the Northern Great Lakes Visitor Center to a new Pikes Creek Substation near Bayfield. After considering feedback from the public, further reviewing possible solutions, and refining cost estimates for each of the options, NSPW Planning staff identified an additional option that would utilize a new 34.5 kV line between the new Fish Creek Substation and Pikes Creek Substation.

2.2 Study Participants

NSPW Planning staff created all of the options considered in this study, performed power flow simulations, analyzed the results, and made recommendations based on those results. These results were presented and reviewed by NSPW Planning and Dairyland Power Cooperative (DPC) Planning staff, at which time comments, conclusions, and recommendations were developed to guide each successive stage of analysis.

3.0 Scope of Study

The purpose of this study is to examine the impact of multiple transmission addition options in the Bayfield Peninsula to address current system deficiencies. In addition, the age and condition of several sections of the existing 34.5 kV system in this area require a complete rebuild. Each transmission option was created to resolve the voltage concerns in the study area and allow additional load growth for the foreseeable future. The voltage problems in the area occur during peak conditions with the system intact. Steady state power flow cases were run to determine the impact of each transmission option on the transmission system under existing and modeled future load projection conditions. Due to the small size of the study area, local load serving nature of the loop, and lack of high voltage interconnections to the study area, dynamic simulations were not required in this analysis.

4.0 Need Overview

The Gingles to Bayfield³ 34.5 kV line serves 17 MW on peak, with roughly half of that load at the end of a 25 mile long radial line. In this peak condition, the Bayfield Substation is currently unable to maintain acceptable voltage levels. Additionally, the entire Bayfield Peninsula does not have single point of failure reliability due to the radial nature of the lines serving the peninsula. This means that failure of a single pole anywhere on the 34.5kV transmission system results in customers being out of power. The lack of single point of failure reliability also means that maintenance is extremely difficult to perform, since the lines in the Bayfield Peninsula are unable to back each other up.

4.1 System Description

The defined study area for this analysis is the 34.5 kV transmission system located along the Bayfield Peninsula in northern Wisconsin. A 115 kV line between Duluth, MN and Ashland, WI provides two sources to the 34.5 kV system off of the same line. The entire Bayfield Peninsula is served by this 34.5 kV transmission system, with 17 MW of the peninsula's total 21 MW located on the eastern side of the peninsula at Xcel Energy's Bayfield, Washburn Iron, and Washburn substations and Bayfield Electric Cooperative's Bayfield (Salmo) and Barksdale substations. The existing system configuration is shown in Figure 4.1.

³ The Bayfield Substation is the last substation on this stretch of 34.5 kV line before the open switch near Cornucopia.

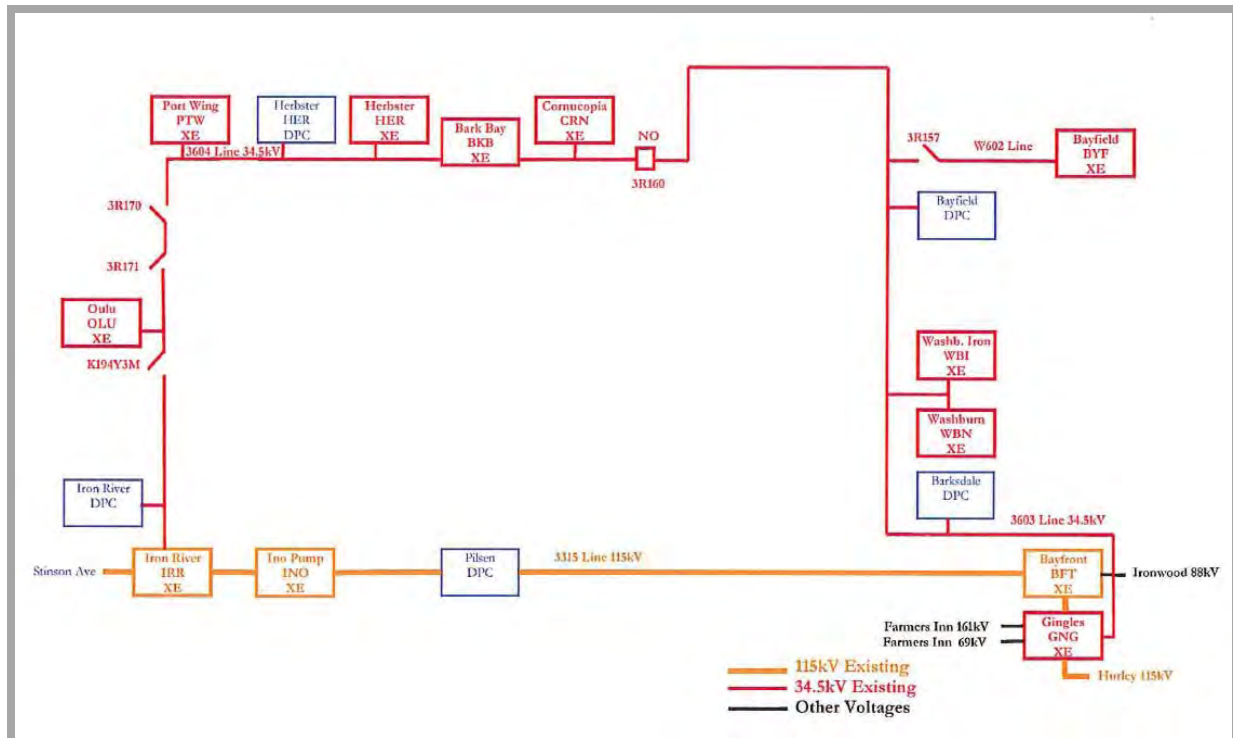


Figure 4.1 Existing System Configuration of the Bayfield Peninsula

While the 34.5 kV system in the Bayfield Peninsula was originally designed to be operated as a closed system, the system is currently being operated with a normally-open switch near Cornucopia which separates the looped system into two load serving radial lines. The normally-open switch can no longer be closed due to potential voltage collapse under single contingency (N-1) situations. A graphic depiction of the current system under peak load, with the switch open near Cornucopia, is shown in Figure 4.2. The voltage violation depicted in Figure 4.2 shows that the current system cannot handle peak loading conditions.

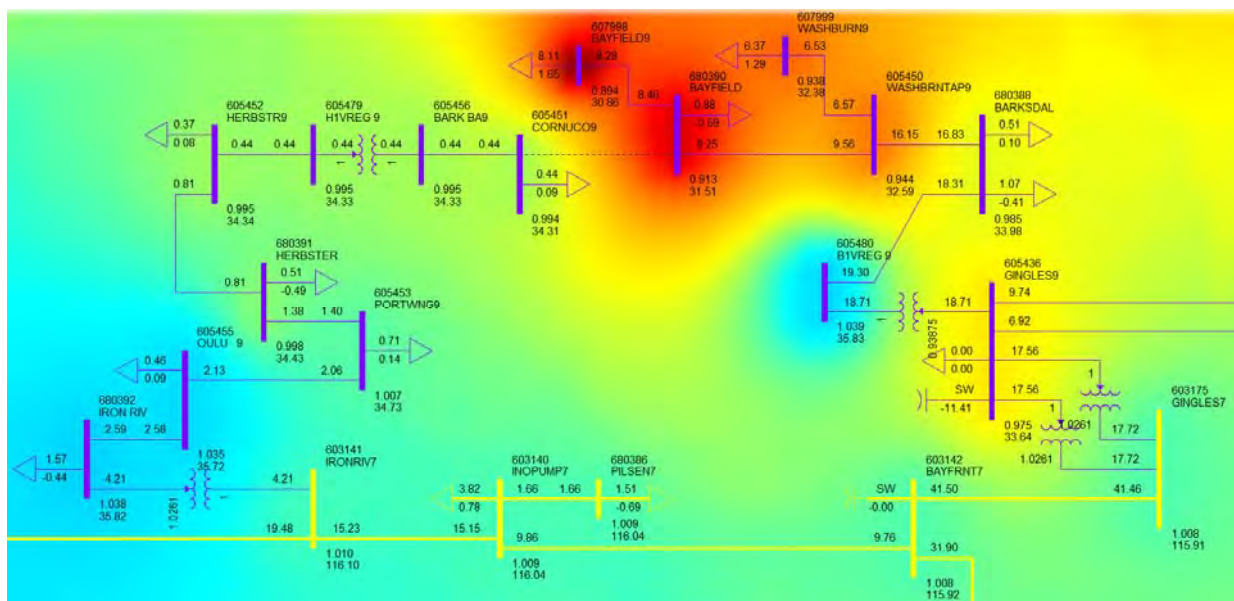


Figure 4.2 Contour Map of the Existing System Configuration under Peak Load

The modeling shows that under system peak for all loads on the Bayfield Peninsula, there will be voltage violations at NSPW Bayfield and DPC Bayfield substations per NSPW voltage criteria as described in Section 4.2.1. Note that red means low voltage, blue means high voltage, and dashed lines mean out-of-service.

For this analysis, the Bay Front Generation Station was the only local generation assumed on during system peak conditions. There is no wind or solar generation in this area and future renewable generation penetration was not studied in this analysis. There are currently no interconnection requests in this area. While Planning understands there has been a Request for Proposals for a Solar Garden in the northern part of NSPW's service territory, it cannot speculate on the potential for future requests or the locations thereof. The Company did, however, receive a recommendation from members of the public to investigate a project that combined solar and batteries. While the Company did not have the detail it would typically require if there had been an interconnection request, it did study this idea on a conceptual level and determined that it was not a feasible alternative. Generally speaking, renewable energy and storage are not a substitute for transmission facilities. This is because solar and wind are intermittent sources of power (i.e., we cannot know with certainty when power will be available from wind or solar generation due to variability in weather). While batteries are sometimes paired with intermittent sources in order to provide power when the intermittent sources cannot, batteries are a finite resource because they can only hold a set amount of power and cannot generate or receive power from other sources if the intermittent sources are not producing electricity.

The Bayfield Peninsula has historically had low voltages on the 34.5 kV system and is at the limitations of the current system. Load projections, based on historical averages for the study area and considering any customer load growth, provided by NSPW Distribution Capacity Planning and DPC, were used to determine the need for additional load serving support along the Bayfield Loop.

Due to the current radial nature, local geography, age, and long length (72 miles) of the 34.5 kV lines of the transmission system in the Bayfield Peninsula, this area is more susceptible to more frequent and potentially longer outages than other areas of the Company's service territory. These outages occur because there are no other lines in the area from which the load can be temporarily served. In addition, the age and condition of the poles and conductor on the 34.5 kV line sections from Iron River to Herbstler and Cornucopia to Bayfield Tap require a complete rebuild. All options in this study include a way to address the age and condition concerns in the Bayfield Peninsula.

4.2 Planning Criteria

4.2.1 Steady State Voltage Criteria

When performing steady state analysis, the voltage criteria in Table 4.2 was applied to NSPW's buses under system intact (pre contingent) and post contingent conditions. This represents the voltage criteria for most of the NSPW owned facilities. Some exceptions to the voltage criteria exist on the NSPW system, but none of the exceptions are located in the area of this study.

Table 4.2

Facility	Maximum voltage (p.u.)	Minimum voltage (p.u.)	Maximum voltage (p.u.)	Minimum voltage (p.u.)
	Pre Contingent		Post Contingent	
Default for all buses > 100 kV	1.05	0.95	1.05	0.92
Default for all buses < 100 kV*	1.05	0.95	1.05	0.92
Default for all generator buses**	1.05	0.95	1.05	0.95

*For 34.5 kV and below non-generation buses, pre and post contingent voltage of 0.9PU would be acceptable.

**For all Category P0, P1, P2, P4, P5, and P7 contingencies. [1] After a Category P3 or P6 contingency, generator bus voltage would be allowed to drop to 0.92 PU.

4.2.2 Line Loading Criteria

The ratings for facilities (transmission lines, transformers and series compensators) owned by NSPW are specified in the NSPW Ratings Database. The winter and summer ratings of facilities account for the thermal limit of all equipment and relay loadability limits, as specified in North American Electric Reliability Corporation (NERC) FAC-008 and FAC-009 standards.

When planning NSPW's system, for system intact condition, the current flowing through a facility should not exceed the normal rating of that facility. When studying contingency conditions, the current flowing through a facility should not exceed the emergency rating of that facility. During transmission outages, it is assumed that the system operators would take remedial action when the current on a facility is lower than the emergency rating and greater than the normal rating. When such remedial action is not available, the normal rating of the facility should be used.

In addition to adhering to these planning criteria, NSPW meets all the guidelines outlined for the transmission planning standards as defined by NERC. NERC TPL-001-4 Table 1 is available in Appendix C.

5.0 Analysis of the Bayfield Peninsula 34.5 kV System

5.1 Models

5.1.1 Steady State Models

The power flow model employed was developed by the Minnesota Transmission Assessment and Compliance Team (MNTACT). The base study model for this analysis was the 2018 summer peak model used in the 2017 MNTACT Annual Assessment. The base model was then modified to utilize the most recent distribution load forecasts for all NSPW and DPC loads in the study area and provide a non-coincident peak for the study area. Table 5.1 shows the loads used in the study model.

Table 5.1 – Study Model Loads

Substation	Study Model 2018SUM MW
Barksdale (DPC)	1.0686
Barksdale (NSPW)	0.513
Bayfield (DPC)	0.8814
Bayfield (NSPW)	8.114
Cornucopia	0.436
Herbster (DPC)	0.5122
Herbster (NSPW)	0.371
Iron River (DPC)	1.5746
Oulu	0.463
Port Wing	0.707
Washburn	6.373

All differences have been verified by each distribution company in the area.

5.1.2 Dynamics Models

There were no power system dynamic stability runs completed as part of this study. The four options that were studied will have a negligible effect on the stability of the bulk transmission system due to the size of the study area, local load serving nature of the loop, and lack of high voltage interconnections to the study area.

5.2 Regional Level Transmission Impacts

There was no regional analysis completed in this study due to the lack of regional lines in the study area. Since the study area is primarily a local load serving system, the impacts of all options being studied on the regional transmission system are negligible, therefore a full regional analysis was not needed. The only line in the study area that has any regional benefit is the Stinson – Bay Front 115 kV line; however, this line has a phase shifter installed on it to limit the flow on the line out of Stinson to approximately 30 MVA, and thus has limited regional benefit. None of the options change this configuration.

5.3 Conditions Studied

5.3.1 Steady State Modeling Assumptions

The technical analysis was performed based on the 2018 summer peak model used in the 2017 MNTACT Annual Assessment. The base model was adjusted to represent the latest available forecast data at the time of this report for summer seasonal peak load conditions.

5.3.2 Performance Evaluation Methods

Due to the small study area, power system performance simulation, system intact and contingency analysis was performed manually with the aid of Power System Simulator for Engineering (PSS®E).

For the power system performance analysis, all NSPW and DPC buses, transmission lines, and transformers in the study area were monitored and included in the contingency analysis.

5.3.3 Steady State Contingencies modeled

For this study, Transmission Planning included all contingencies in the study area. Key area system deficiencies and contingencies are listed in Table 5.2. All of the contingencies listed below are N-1 contingencies that outage load, with no way to back up the outaged load.

Table 5.2 – Key System Deficiencies and Contingencies

Year	Contingency	Issue (Substations out of power)	Load Outaged
2018	Gingles - Barksdale 34.5 kV line	Bayfield, Bayfield (DPC), Washburn Iron, Washburn, and Barksdale loads outaged	17.0 MW
2018	Barksdale - Washburn Tap 34.5 kV line	Bayfield, Bayfield (DPC), Washburn Iron, and Washburn loads outaged	15.4 MW
2018	Washburn Tap - Bayfield Tap 34.5 kV line	Bayfield and Bayfield (DPC) loads outaged	9.0 MW
2018	Iron River 115/34.5 kV transformer	Cornucopia, Herbster, Herbster (DPC), Port Wing, Oulu, and Iron River (DPC) loads outaged	4.1 MW
2018	Iron River - Oulu 34.5 kV line	Cornucopia, Herbster, Herbster (DPC), Port Wing, and Oulu loads outaged	2.5 MW
2018	Oulu - Port Wing 34.5 kV line	Cornucopia, Herbster, Herbster (DPC), and Port Wing loads outaged	2.0 MW
2018	Port Wing - Herbster (DPC) 34.5 kV line	Cornucopia, Herbster, and Herbster (DPC) loads outaged	1.3 MW
2018	Herbster (DPC) - Herbster 34.5 kV line	Cornucopia and Herbster loads outaged	0.8 MW
2018	Herbster - Cornucopia 34.5 kV line	Cornucopia load outaged	0.4 MW

As shown in Table 5.2 with the loss of a line section between two substations (N-1 contingency), load is blacked out until the problem is fixed. Each of these contingencies has historically occurred and the towns north of the contingency were out of power.

5.4 Base Case Analysis

As described in Section 4.1, the Bayfield Peninsula is currently being operated as two radial load serving lines, without the ability to close the looped system. Due to the radial nature of the transmission system in the area, load will be dropped under any contingency until the problem is physically fixed. Key area system deficiencies and contingencies are listed in Table 5.2. Since the voltage and condition issues exist in the base case, and the lines are radial, the need in this area is independent of load growth and will not be eliminated with slow load growth.

Shown below in Figure 5.1 (and in Figure 4.1) is a contour map of the existing system as forecasted for 2018. Modeling the latest forecasted load values results in low voltages at Bayfield under normal system intact conditions. Note that red means low voltage, blue means high voltage, and dashed means out-of-service.

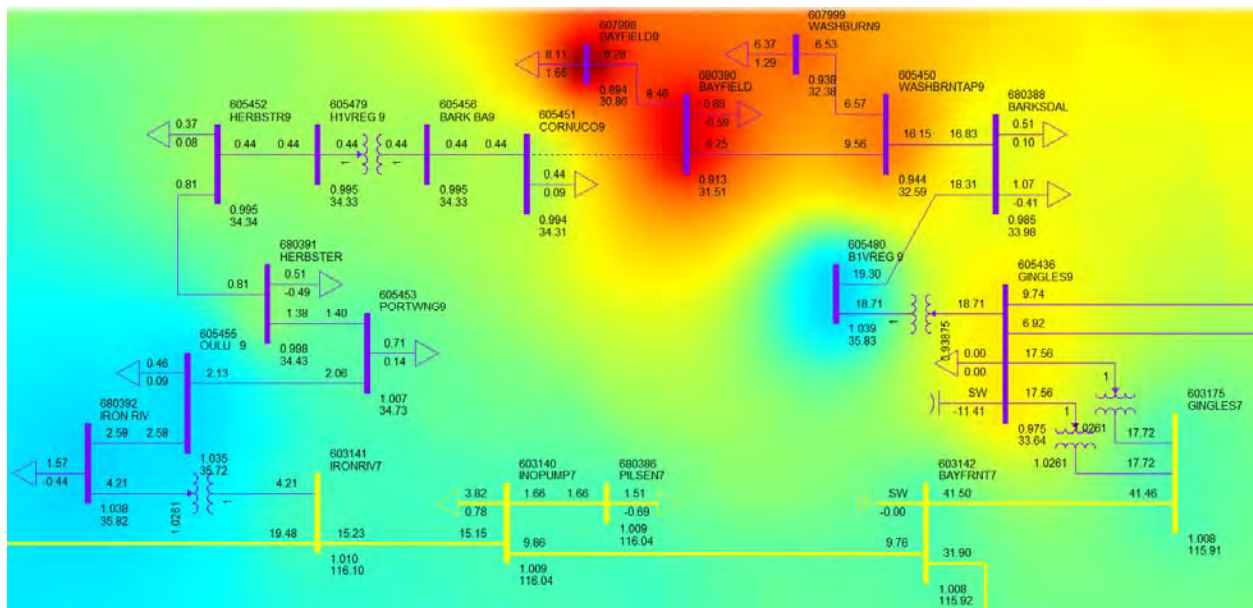


Figure 5.1 2018: System Intact - Summer Peak

Figure 5.2 shows the contour map for the largest loss of load condition: outage near Barksdale and attempting to close down the normally open switch to serve the entire load from the Iron River substation.

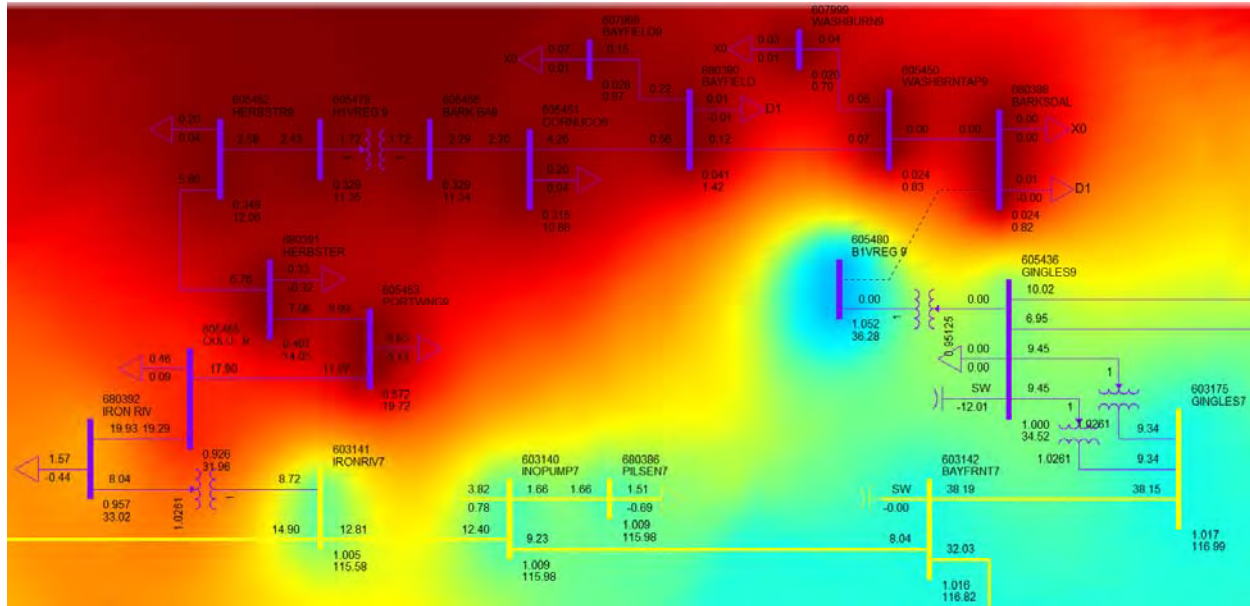


Figure 5.2 2018: Gingles – Barksdale 34.5 kV Outage, Attempting to Serve Load from Iron River at Peak Load. Result: Extreme Low Voltage/Voltage Collapse for the Entire Bayfield Peninsula

Figure 5.3 shows the contour map for the largest loss of load condition, outage near Barksdale, without closing down the normally open switch and instead not serving the entire load.

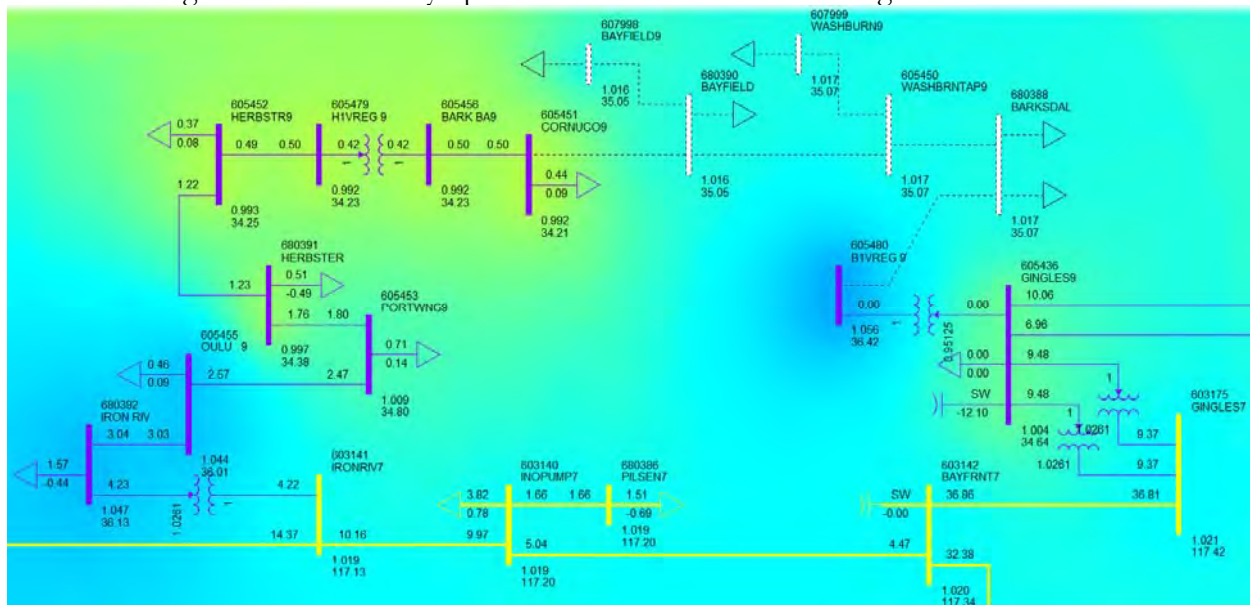


Figure 5.3 2018: Gingles – Barksdale 34.5 kV Outage, Without Attempting to Serve Load from Iron River. Result: Bayfield, Washburn, and Barksdale Loads are Out of Power

5.5 Options Evaluated

Since the Bayfield Peninsula 34.5 kV system is radial, any construction activities will need to be carefully coordinated with both Operations and Construction to ensure minimal impacts to customers along the peninsula. All options described below address the immediate and future load serving needs of the Bayfield Peninsula area.

5.5.1 Option 1: New 115 kV Line to Bayfield

This option would require a new substation to be built on the Bay Front – Ino Pump 115 kV line (“Fish Creek Substation”) and on the Bayfield – Washburn 34.5 kV line (“Pikes Creek Substation”). To connect these two substations, a new 115 kV line from Fish Creek Substation to Pikes Creek Substation would be constructed. This 115 kV line would provide the Bayfield Peninsula with an additional strong power source and many years of room for load growth. This option would split the current system with two radial lines into two 34.5kV load serving loops, greatly reducing the exposure of load to power outages. This option also includes the age and condition rebuild of the existing Iron River – Herbster and Cornucopia – Bayfield Tap 34.5 kV lines. The new Pikes Creek Substation would be designed to handle future 34.5 kV capacitor banks, providing future flexibility to the area.

Estimated planning level cost for this option is \$60 million.

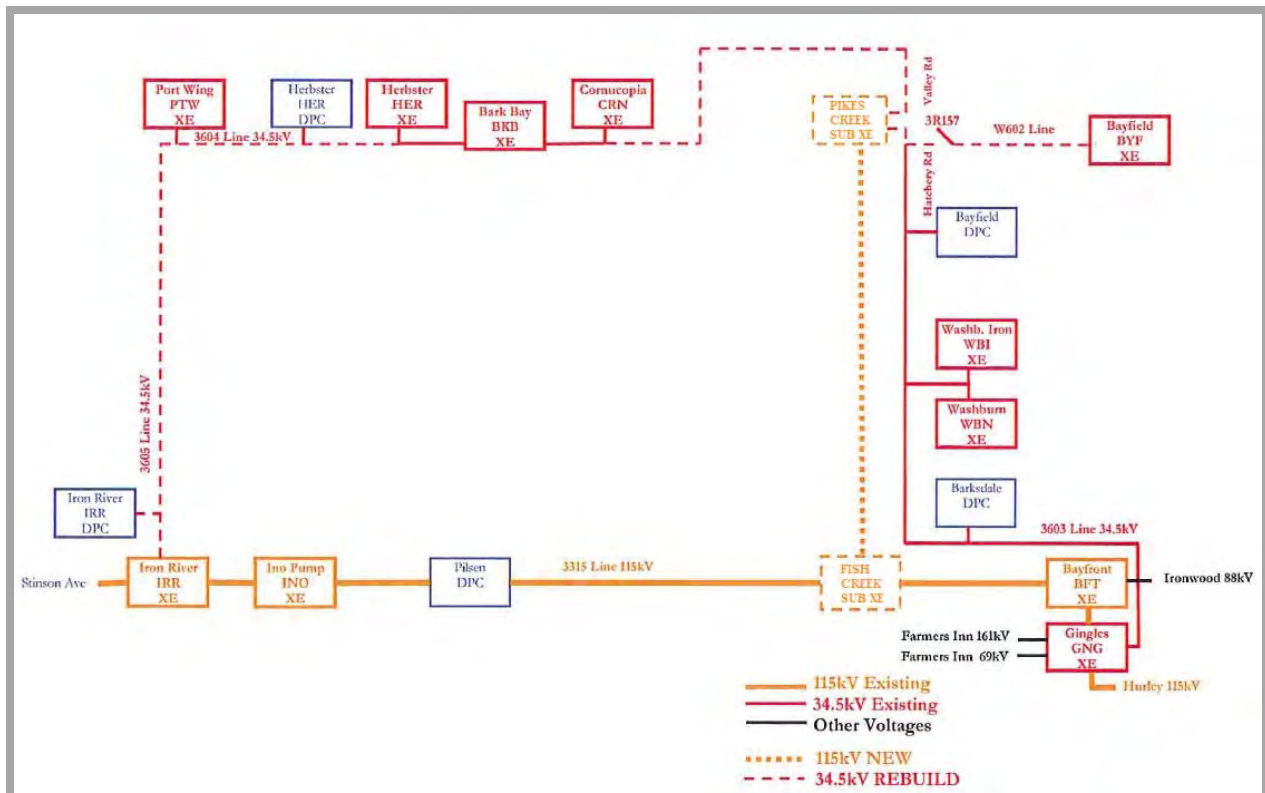


Figure 5.4 Configuration of Option 1

5.5.2 Option 2: Rebuild Entire 34.5 kV Loop to 115 kV

This option would rebuild the entire existing Bayfield Loop 34.5 kV line to a single circuit 115 kV line, including 19 miles of 24 kV distribution underbuild in the Herbster area. This option requires new 115 kV load serving substations at Iron River, Bayfield, Washburn, and Barksdale. The remaining existing substations along the Bayfield Peninsula would be served through the 24 kV distribution line built underneath the 115 kV line conductors. This option would create a 115 kV load serving loop with only a small portion of distribution remaining that serves the small substations from Port Wing to Cornucopia. This option is essentially future proof, in that the Bayfield Peninsula would be able to handle vast amounts of load and likely never run out of load

serving capabilities. However, given that the Bayfield Peninsula is not expected to see significant load growth, this option is too large for this area.

Estimated planning level cost for this option is \$90 million.

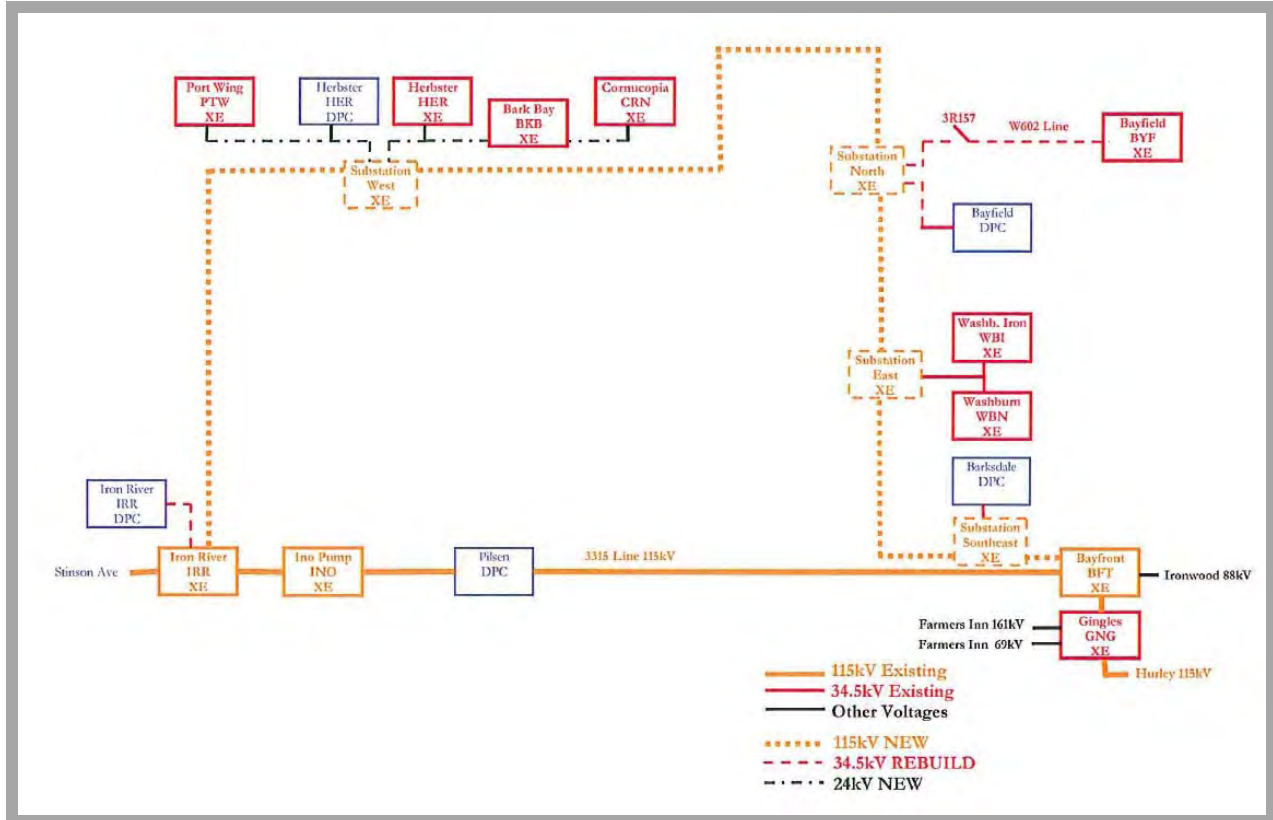


Figure 5.5 Configuration of Option 2

5.5.3 Option 3: Double Circuit 115/34.5 kV Entire Loop

This option would rebuild the entire existing 34.5 kV option to double circuit 115/34.5 kV, with new 115 kV substations near Herbster and Bayfield. The reason behind building the loop to double circuit is that the existing substations along the 34.5 kV loop will remain in their current state. This option would create a 115 kV looped system feeding a parallel 34.5 kV load serving loop at multiple injection points. Similar to the option in 5.5.2, this option is also essentially future proof. This option allows the Bayfield Peninsula to handle vast amounts of load and would likely never run out of load serving capabilities. However, given that the Bayfield Peninsula is not expected to see significant load growth, this option is too large for this area.

Estimated planning level cost for this option is \$90 million.

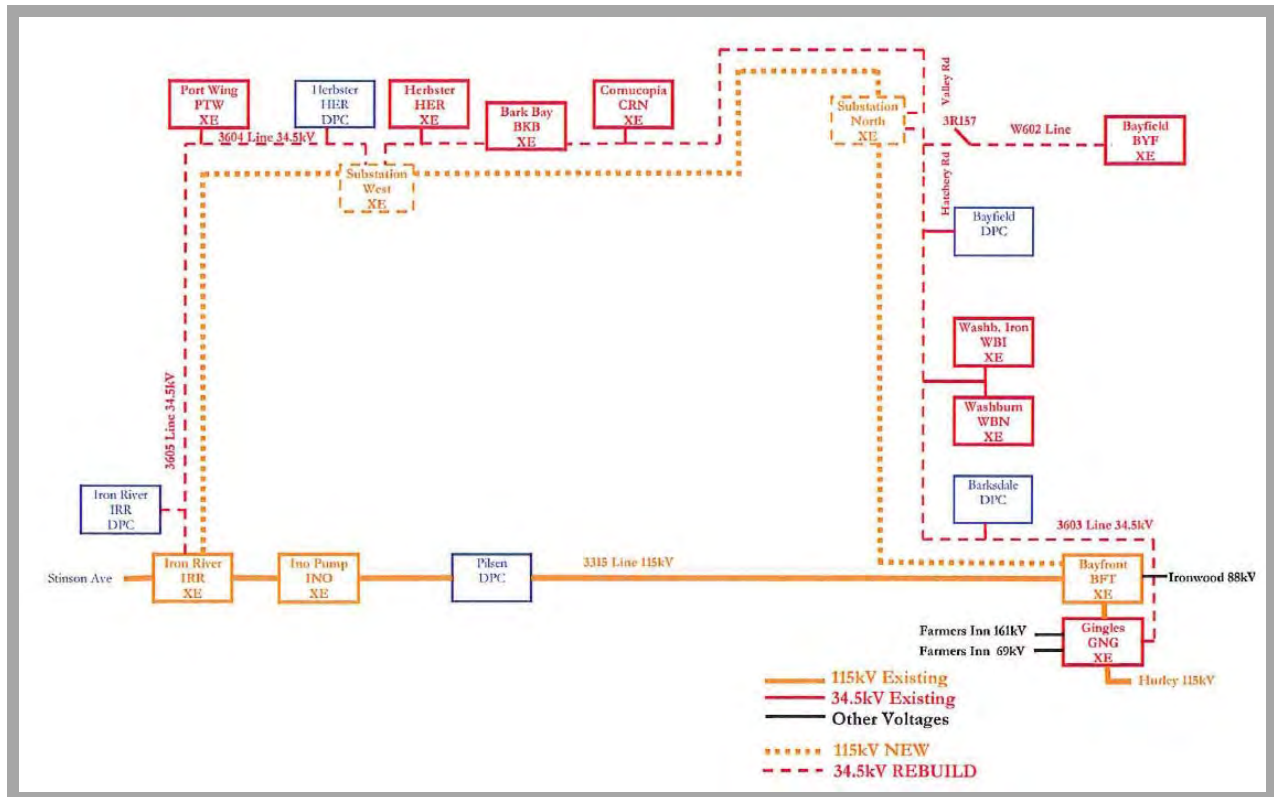


Figure 5.6 Configuration of Option 3

5.5.4 Option 4: New 34.5 kV Line to Bayfield Built to 69 kV Standards

This option would require a new substation to be built on the Bay Front – Ino Pump 115 kV line (“Fish Creek Substation”) and on the Bayfield – Washburn 34.5 kV line (“Pikes Creek Substation”). To connect these two substations, a new 34.5 kV line from Fish Creek Substation to Pikes Creek Substation would be constructed. In addition, an emergency tie line would be constructed between the new 34.5 kV line and the existing 34.5 kV line to allow the system to handle N-1 contingency outages. The emergency tie would be operated normally open and only closed when a portion of either the existing or the new 34.5 kV line is outaged. This option also includes the rebuild of the existing 34.5 kV lines from Bayfield to Cornucopia and from Herbster to Iron River, following completion of the new 34.5 kV line.

The design for all new 34.5 kV would use horizontal post 69 kV insulators and shield wire, which provides greater reliability advantages over the existing 34.5 kV line’s design. This shielded compact design allows the Company to accommodate longer spans (less footprint), needed lightning protection, and more robust structural load considerations to reliably traverse open expanses of territory. The proposed design for Option 4 also requires a narrower right-of-way width and smaller structures than would be necessary for a 115 kV line included in other options. Conventional "distribution" type geometry and line design used in 34.5 kV construction, such as the existing 34.5 kV system serving the Bayfield Peninsula, is suited for short spans in urban areas with smaller wire and multiple load serving taps. The conventional design is not well suited for this area.

With this option future load growth in the area could be accommodated using a modular approach by making the following modifications to the system⁴:

- Installing a second capacitor bank at the Pikes Creek Substation;
- Installing static VAR compensator (SVC) or static synchronous compensator (STATCOM) at Pikes Creek Substation;
- Converting the system from 34.5 kV to 69 kV operation by replacing transformers at the Cornucopia, DPC Herbster, Herbster, Port Wing, Oulu, and Iron River substations. These transformers are load serving and will likely need to be replaced in the future, at which time dual high side transformers could be installed, thus making the conversion to 69 kV simple when necessary. Additionally, the transformer at the new Fish Creek Substation would need to be replaced and a transformer added at the new Pikes Creek Substation.

This option provides an additional source of power to the area, and allows for a modular approach to serving potential future load growth.

Estimated planning level cost for this option is \$40 million.

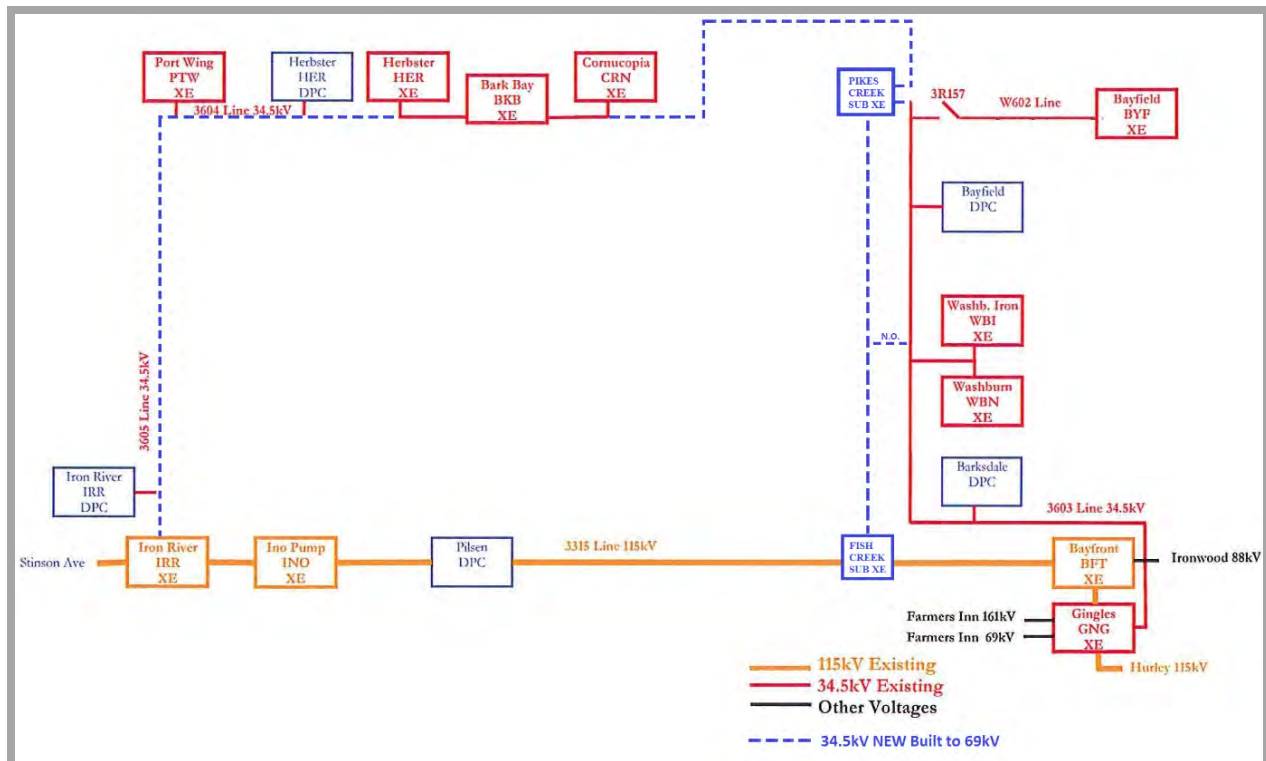


Figure 5.7 Configuration of Option 4

This option does not have a double circuit configuration as a standalone option like Option 2 and Option 3 above, due to the fact that double circuiting does not provide single point of failure reliability. This means that for the loss of a single double circuit tower, all customers between the

⁴ Future modifications outlined are conceptual and not planned. They are called out to show theoretical system improvements after the current study needs are addressed and if load growth is accelerated beyond what was used for the purpose of this study.

outage and Cornucopia substation will be out of power. This topic will be discussed further in Section 6.0.

6.0 Planning Considerations for Transmission Structure Configurations

As part of the normal planning process, double circuiting with existing transmission lines is analyzed. This type of analysis is completed to determine if the system can handle the loss of the double circuit, since a common structure would form a single point of failure for two lines. For the Bayfield Peninsula, double circuiting the new line with the existing 34.5 kV line on the east side of the Bayfield Peninsula as a route alignment for Options 1 and 4 does not provide N-1 reliability for up to 17 MW of load on peak. This is because an occurrence (e.g, a single pole failing) will take out both circuits of the line because they are both located on the same poles. This double circuiting configuration is not recommended because the west side of the peninsula is not capable of supporting any of the load on the east side of the peninsula as shown in Figure 5.2. Even after the Iron River – Herbster and Cornucopia – Bayfield Tap 34.5 kV lines are rebuilt, the west side of the Bayfield Peninsula will not be able to serve any of the load on the east side.

From a Transmission Planning and Operations perspective, a new completely independent line or a new line paralleling the existing 34.5 kV line is preferred for Option 1 and Option 4. Three possible routing alignments for the four options are discussed below.

6.1 New Alignment with Separate Right-of-Way from Existing Lines in Options 1 and 4

From a planning standpoint, building on a new right-of-way is always preferred because it provides isolation between the existing and new lines. Once the line is built, there are no common corridors or double circuit conditions that take out both circuits. Outage concerns during construction and future maintenance activities are also completely mitigated when using a completely new right-of-way.

6.2 New Alignment Paralleling Existing Lines in Options 1 and 4

Paralleling the existing 34.5 kV line with a new line performs electrically similar to the new right-of-way option listed above. This option does not provide the same geographic separation of lines that the separate right-of-way option above does, therefore there is minimal risk of a weather event in the corridor taking out both lines. In this option, the issue of a single pole failure or planned maintenance resulting in outages on both lines which is identified in the double circuit option below is eliminated. This “single point of failure” issue was one of the need drivers for the project and this alignment would allow either of the lines to be taken out while still providing power through the remaining line.

6.3 New Line Double-Circuited with Existing Lines in Options 1 and 4

Double Circuiting the existing 34.5 kV line with a new line performs electrically similar to the two other options listed above. However, double circuiting the existing 34.5 kV line with a new line involves rebuilding the existing 34.5 kV line in conjunction with construction of the new line. In this option, both lines would be located on new taller poles capable of accommodating three phases on each side. If this alignment were constructed the both unplanned and planned outage of the double circuit (both lines) would be included in all future planning analyses as a single event. Planning would always analyze this configuration as a single event since a pole outage causes both circuits to

go out. If a pole needs to be replaced for maintenance, either both circuits must be taken out or “hot” work (i.e., having crews work on the structure while one of the circuits was energized) would need to be utilized. Additionally, there are no current age and condition concerns with the existing Gingles – Bayfield Tap 34.5 kV line and the existing transmission line it would not otherwise need to be rebuilt in any of the other two alignment scenarios other than double circuiting with a new line. Transmission System Planning’s recommendation is to not double circuit a new line with an existing line in Option 1 and Option 4.

Figure 6.1 shows a contour map of the double circuit outage in Option 4; note that the system collapsed.

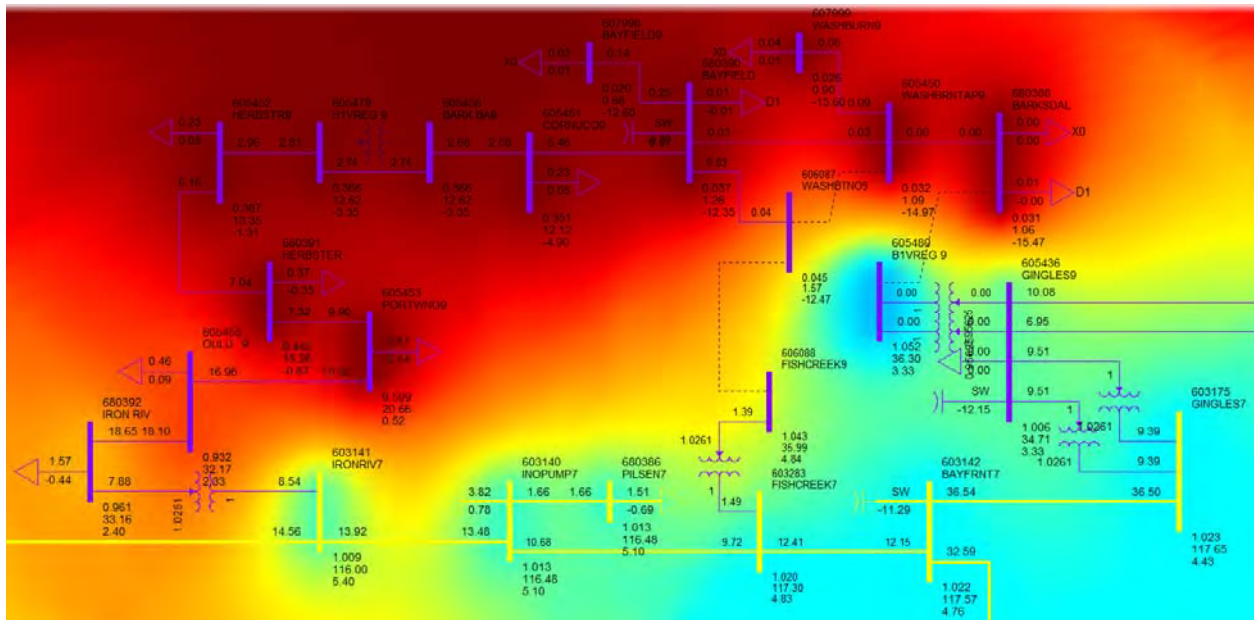


Figure 6.1 Contour Map Representing an Outage from a Double-Circuit Pole Failure

6.4 Double Circuiting With Existing Lines in Options 2 or 3

In the analysis of the alternatives, the use of double circuiting or utilizing distribution underbuild was driven by Transmission Planning for Option 2 (rebuild entire loop to 115 kV) and Option 3 (double-circuit entire loop to 115/34.5 kV). In the case of these two alternatives, double circuiting or distribution underbuild is actually preferred as integral to each option and does not impact system reliability. The reason why system reliability is not impacted when considering a double-circuiting in for Options 2 and Option 3 is because each new 115 kV line is built along the entire 72 miles of the Bayfield Peninsula and connected on both ends allowing adequate load serving capability from either direction.

7.0 Conclusion

The Gingles to Bayfield 34.5 kV line serves 17 MW on peak, with roughly half of that load at the end of a 25 mile long radial line. In this condition, the Bayfield Substation is currently unable to maintain acceptable voltage levels. Additionally, the entire Bayfield Peninsula does not have single point of failure reliability due to the radial nature of the lines serving the peninsula; this means that failure of a single pole results in customers being out of power. The lack of single point of failure reliability also means that maintenance is extremely difficult to perform, since the lines in the Bayfield Peninsula are unable to back each other up.

The Bayfield Peninsula Study reviewed the capability of the existing transmission system to serve the current and future load on the Bayfield Peninsula 34.5 kV loop. The resulting preferred option is Option 4. This option includes the constructing a new 34.5 kV single circuit line on the east side of the peninsula, building a new 115/34.5 kV “Fish Creek” substation along the Bay Front to Iron River 115 kV line, and building a new 34.5 kV “Pikes Creek” breaker substation near the middle of the existing system in the Bayfield Peninsula. An emergency tie between the new and existing lines on the east side of the Bayfield Loop is needed to serve load under N-1 contingency situations and will help minimize outage exposure to the peninsula. After the new Fish Creek to Pikes Creek 34.5 kV line is constructed, a portion of the existing 34.5 kV line on the west side of the peninsula will be rebuilt. All transmission lines included as part of this project will be constructed to 69 kV standards, which is the Company’s standard design for 34.5 kV transmission facilities. Figure 7.1 shows a representative map of Option 4.

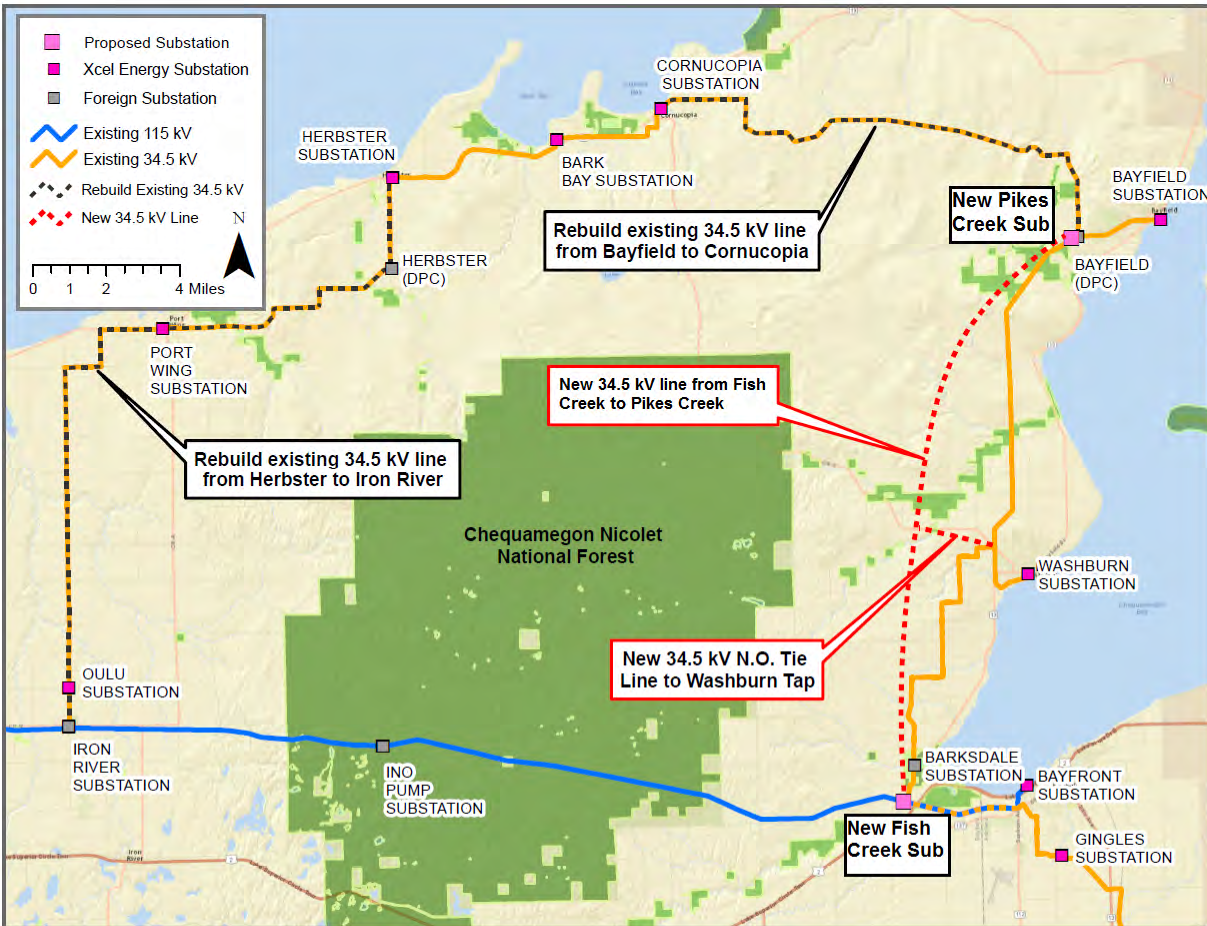


Figure 7.1 Map of Preferred Option 4

This recommended project will serve the projected load in the study area for the foreseeable future and provide flexibility for serving load growth beyond what is expected. Below in Figure 7.2 is the preferred option showing the same contingency as listed in the contour maps shown in Section 5 above. Note that all load is served under contingency.

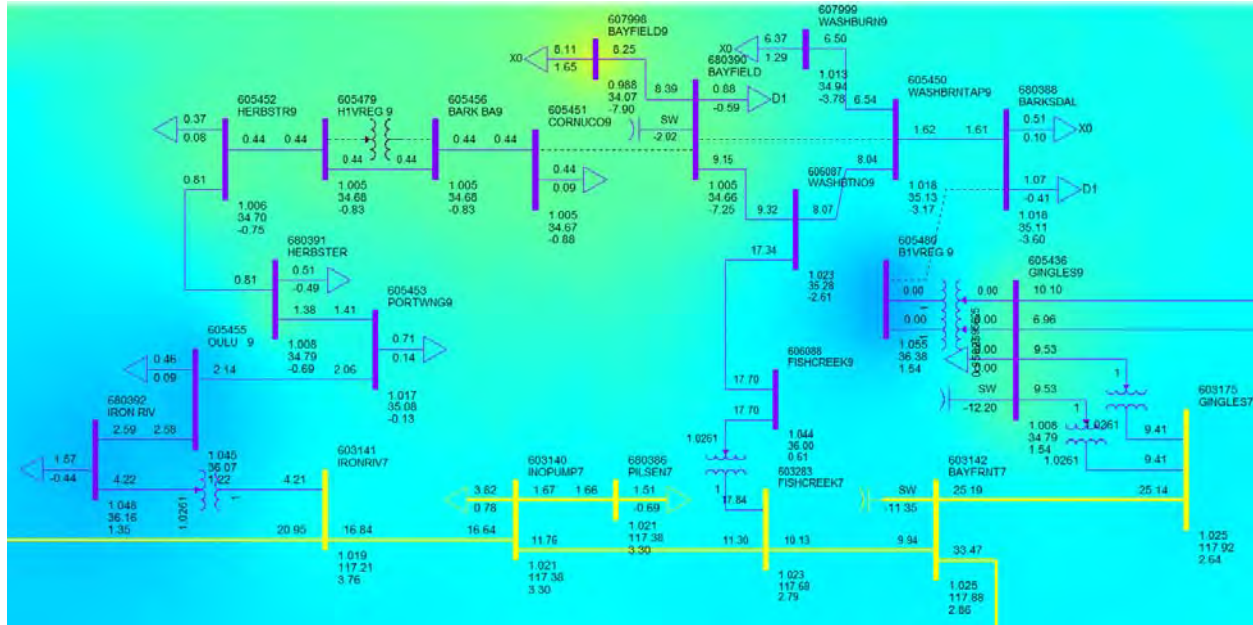


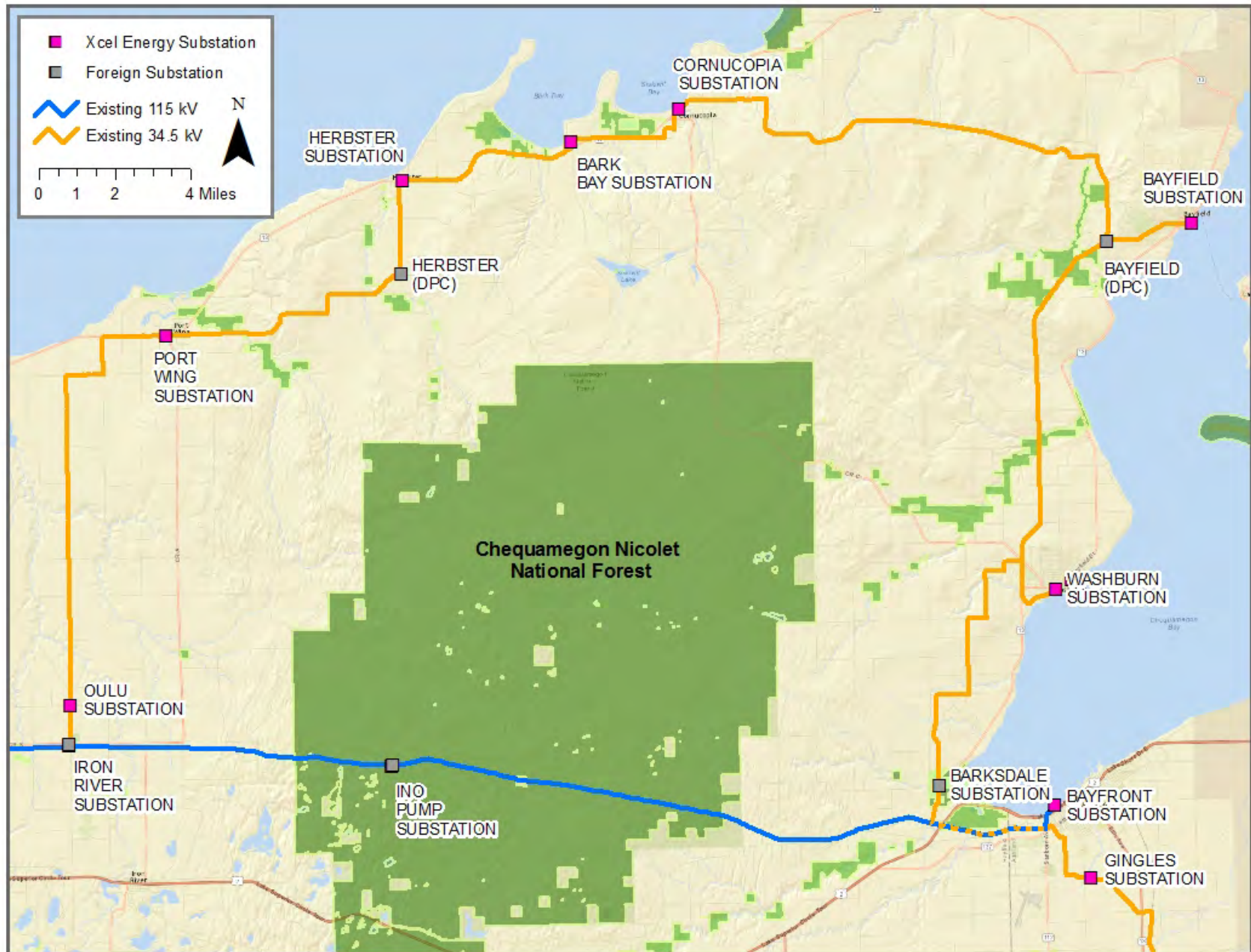
Figure 7.2 Preferred Option: 2018 Gingles – Barksdale 34.5 kV Outage, Serving All Load.

While all of the study options address the immediate and future load serving needs of the Bayfield Peninsula area, Option 4 is the preferred option because it accomplishes the project goals using smaller infrastructure than the three 115 kV options and does so at a lower cost.

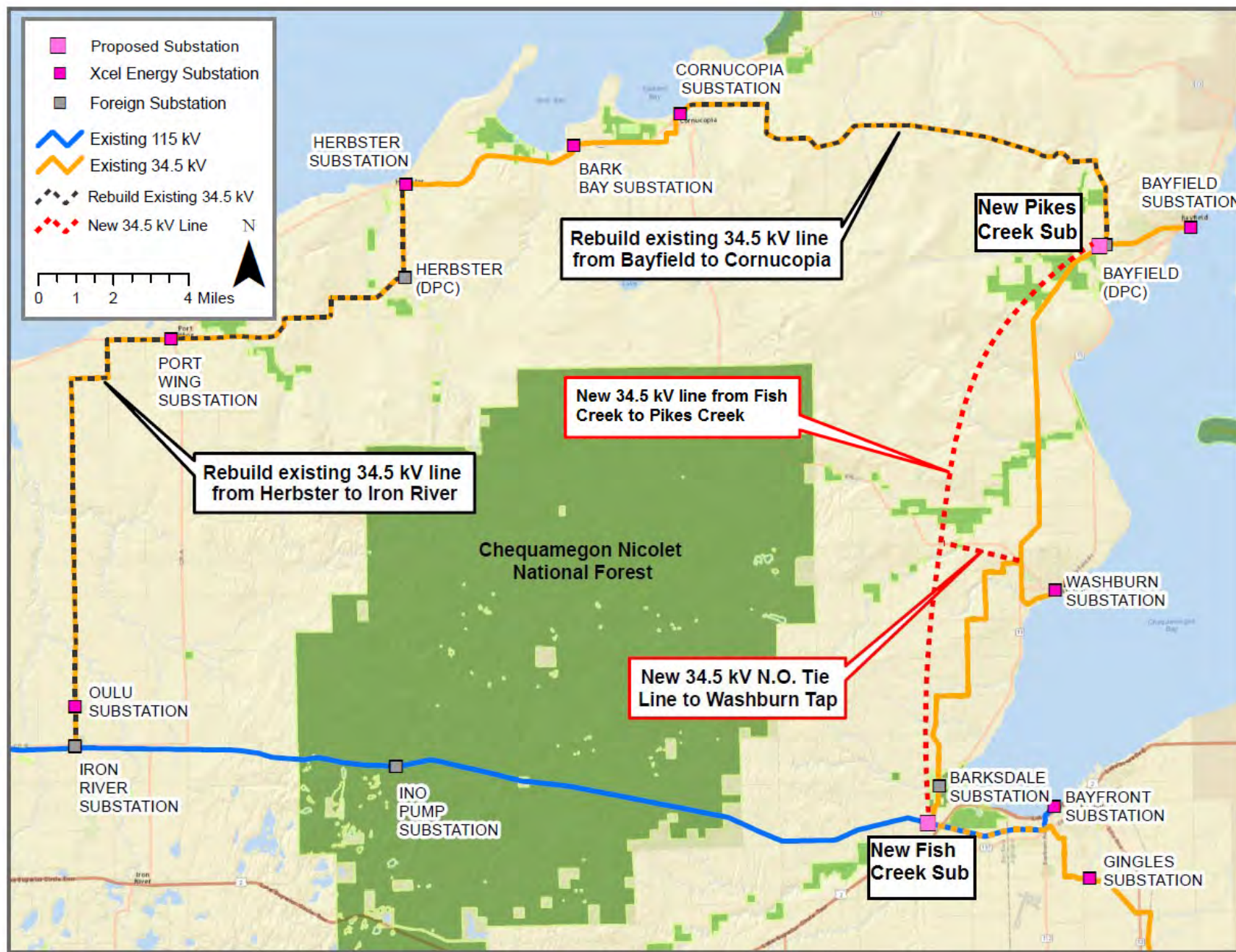
Appendix A: Location Maps

The enclosed maps are for geographic orientation and planning purposes only.

Note that the new transmission line features are illustrative only and do not imply proposed routing.



Existing Transmission System in the Bayfield Loop



Preferred Option 4: Construct new 34.5 kV from New Fish Creek Substation to New Pikes Creek Substation, Rebuild Bayfield to Cornucopia and Herbster to Iron River

Appendix B: Bayfield Peninsula Outage History – Xcel Energy Substations

Substation	Outage Date	Outage Time	Outage Duration (minutes)	Outage Duration	CMOs (Customer Minutes Out)	Customers Out
Barksdale	10/15/2017	5:27 AM	5	5 min	685	137
Bayfield	10/15/2017	5:27 AM	5	5 min	13160	2,632
Washburn	10/15/2017	5:27 AM	5	5 min	7410	1482
Washburn Iron	10/15/2017	5:27 AM	5	5 min	5	1
Cornucopia	10/14/2017	9:46 PM	564	9 hr 24 min	73884	131
Herbster	10/14/2017	9:46 PM	564	9 hr 24 min	80652	143
Oulu	10/14/2017	9:46 PM	249	4 hr 9 min	23904	96
Port Wing	10/14/2017	9:46 PM	249	4 hr 9 min	89391	359
Cornucopia	10/10/2017	8:15 AM	Momentary	Momentary	Momentary	131
Herbster	10/10/2017	8:15 AM	Momentary	Momentary	Momentary	143
Oulu	10/10/2017	8:15 AM	Momentary	Momentary	Momentary	96
Port Wing	10/10/2017	8:15 AM	Momentary	Momentary	Momentary	359
Cornucopia	10/4/2017	10:12 AM	218	3 hr 38 min	28558	131
Cornucopia	10/4/2017	1:57 PM	93	1 hr 33 min	12183	131
Cornucopia	10/4/2017	10:10 AM	2	2 min	262	131
Herbster	10/4/2017	10:12 AM	218	3 hr 38 min	30738	141
Herbster	10/4/2017	1:57 PM	93	1 hr 33 min	13113	141
Herbster	10/4/2017	10:10 AM	2	2 min	282	141
Oulu	10/4/2017	10:12 AM	78	1 hr 18 min	7488	96
Oulu	10/4/2017	1:57 PM	39	39 min	3744	96
Oulu	10/4/2017	10:10 AM	2	2 min	192	96
Port Wing	10/4/2017	10:12 AM	78	1 hr 18 min	27534	353
Port Wing	10/4/2017	1:57 PM	39	39 min	14001	359
Port Wing	10/4/2017	10:10 AM	2	2 min	706	353
Barksdale	7/21/2016	4:26 AM	497	8 hr 17 min	5,964	12
Bayfield	7/21/2016	4:26 AM	497	8 hr 17 min	846,391	1,703

Substation	Outage Date	Outage Time	Outage Duration (minutes)	Outage Duration	CMOs (Customer Minutes Out)	Customers Out
Cornucopia	7/21/2016	4:02 AM	610	10 hr 10 min	79,910	131
Cornucopia	7/21/2016	8:33 PM	55	55 min	7,205	131
Herbster	7/21/2016	4:02 AM	658	10 hr 58 min	88,172	134
Herbster	7/21/2016	8:33 PM	61	1 hr 1 min	8,174	134
Oulu	7/21/2016	4:02 AM	707	11 hr 47 min	68,579	97
Port Wing	7/21/2016	4:02 AM	928	15 hr 28 min	155,904	168
Port Wing	7/21/2016	8:33 PM	61	1 hr 1 min	10,248	168
Washburn	7/21/2016	4:26 AM	497	8 hr 17 min	539,245	1,085
Washburn Iron	7/21/2016	4:26 AM	497	8 hr 17 min	497	1
Cornucopia	11/11/2015	10:07 AM	19	19 min	2,489	131
Herbster	11/11/2015	10:07 AM	19	19 min	2,812	148
Oulu	11/11/2015	10:07 AM	19	19 min	1,824	96
Port Wing	11/11/2015	10:07 AM	19	19 min	6,783	357
Barksdale	4/1/2015	3:10 PM	67	1 hr 7 min	9,179	137
Bayfield	4/1/2015	3:10 PM	143	2 hr 23 min	379,522	2,654
Washburn	4/1/2015	3:10 PM	143	2 hr 23 min	213,785	1,495
Washburn Iron	4/1/2015	3:10 PM	143	2 hr 23 min	143	1
Cornucopia	6/15/2014	3:03 PM	282	4 hr 42 min	37,788	134
Herbster	6/15/2014	3:03 PM	282	4 hr 42 min	42,300	150
Oulu	6/15/2014	3:03 PM	310	5 hr 10 min	29,760	96
Port Wing	6/15/2014	3:03 PM	282	4 hr 42 min	101,520	360
Cornucopia	4/18/2013	11:03 PM	472	7 hr 52 min	64,360	136
Herbster	4/18/2013	11:03 PM	472	7 hr 52 min	69,856	148
Oulu	4/18/2013	11:03 PM	472	7 hr 52 min	46,256	98
Port Wing	4/18/2013	11:03 PM	472	7 hr 52 min	168,504	357
Cornucopia	7/31/2012	3:43 AM	173	2 hr 53 min	22,490	130
Cornucopia	7/31/2012	7:12 AM	4	4 min	520	130
Herbster	7/31/2012	3:43 AM	173	2 hr 53 min	25,777	149
Herbster	7/31/2012	7:12 AM	4	4 min	596	149

Substation	Outage Date	Outage Time	Outage Duration (minutes)	Outage Duration	CMOs (Customer Minutes Out)	Customers Out
Oulu	7/31/2012	3:43 AM	173	2 hr 53 min	13,954	80
Oulu	7/31/2012	7:12 AM	4	4 min	392	98
Port Wing	7/31/2012	3:43 AM	173	2 hr 53 min	61,761	357
Port Wing	7/31/2012	7:12 AM	4	4 min	1,428	357
Cornucopia	12/1/2011	1:37 PM	48	48 min	6,240	130
Herbster	12/1/2011	1:37 PM	48	48 min	7,104	148
Oulu	12/1/2011	1:37 PM	48	48 min	4,608	96
Port Wing	12/1/2011	1:37 PM	48	48 min	17,088	356
Cornucopia	4/3/2011	6:35 AM	270	4 hr 30 min	35,640	132
Herbster	4/3/2011	6:35 AM	270	4 hr 30 min	39,690	147
Port Wing	4/3/2011	6:35 AM	270	4 hr 30 min	95,580	354
Bayfield	9/24/2010	11:36 AM	293	4 hr 53 min	754,475	2,575

Appendix C: NERC TPL-001-4 Table 1

Table 1 – Steady State & Stability Performance Planning Events						
Category	Initial Condition	Event 1	Fault Type ²	BES Level ³	Interruption of Firm Transmission Service Allowed ⁴	Non-Consequential Load Loss Allowed
P0 No Contingency	Normal System	None	N/A	EHV, HV	No	No
P1 Single Contingency	Normal System	Loss of one of the following: 1. Generator 2. Transmission Circuit 3. Transformer ⁵ 4. Shunt Device ⁶	3Ø	EHV, HV	No ⁹	No ¹²
		5. Single Pole of a DC line	SLG			
P2 Single Contingency	Normal System	1. Opening of a line section w/o a fault ⁷	N/A	EHV, HV	No ⁹	No ¹²
		2. Bus Section Fault	SLG	EHV	No ⁹	No
				HV	Yes	Yes
		3. Internal Breaker Fault ⁸ (non-Bus-tie Breaker)	SLG	EHV	No ⁹	No
				HV	Yes	Yes
		4. Internal Breaker Fault (Bus-tie Breaker) ⁸	SLG	EHV, HV	Yes	Yes
P3 Multiple Contingency	Loss of generator unit followed by System adjustments ⁹	Loss of one of the following: 1. Generator 2. Transmission Circuit 3. Transformer ⁵ 4. Shunt Device ⁶	3Ø	EHV, HV	No ⁹	No ¹²
		5. Single pole of a DC line	SLG			

Table 1 – Steady State & Stability Performance Planning Events

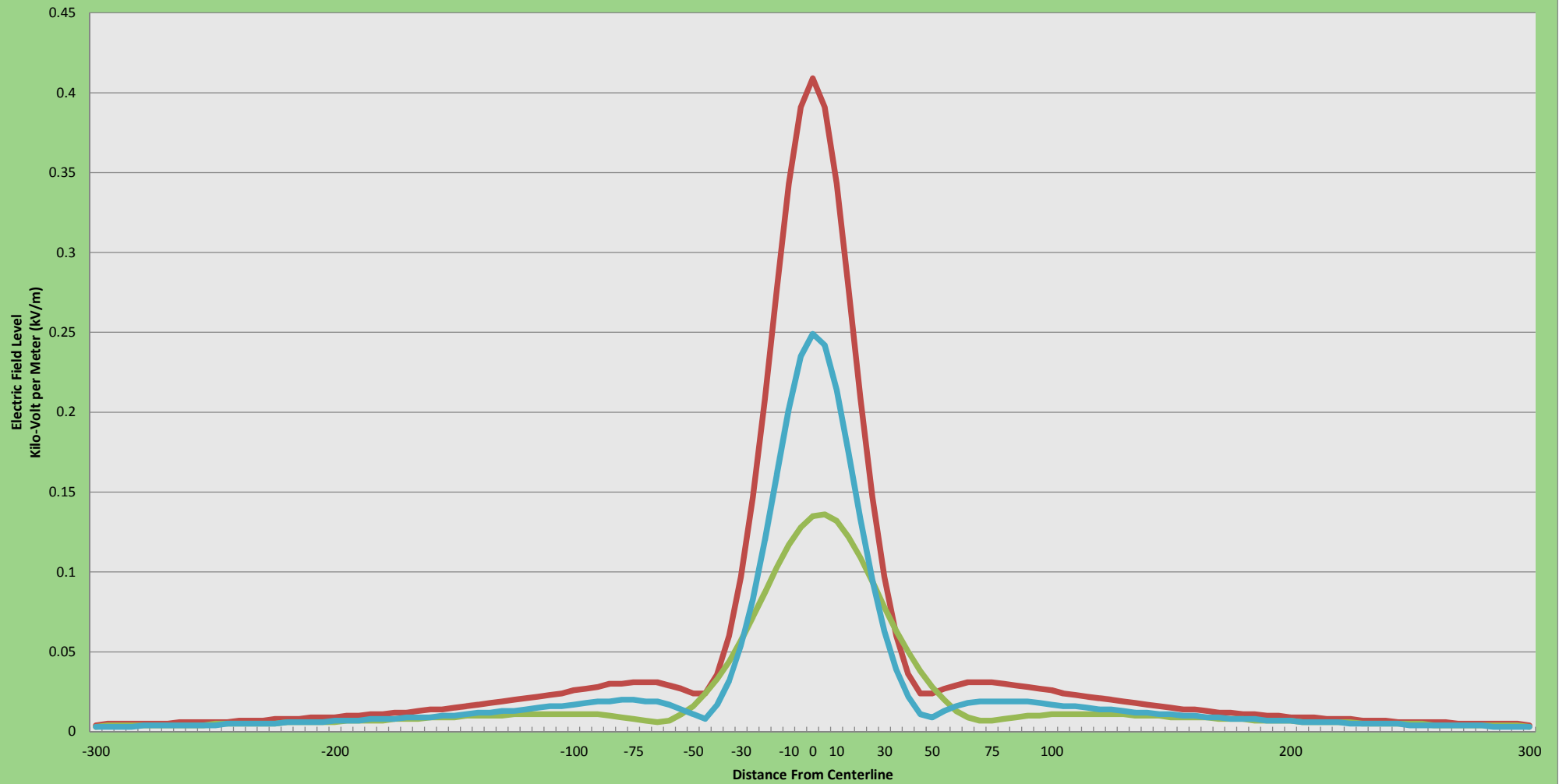
Category	Initial Condition	Event 1	Fault Type ²	BES Level ³	Interruption of Firm Transmission Service Allowed ⁴	Non-Consequential Load Loss Allowed
P4 Multiple Contingency (<i>Fault plus stuck breaker¹⁰</i>)	Normal System	Loss of multiple elements caused by a stuck breaker ¹⁰ (non-Bus-tie Breaker) attempting to clear a Fault on one of the following: 1. Generator 2. Transmission Circuit 3. Transformer ⁵ 4. Shunt Device ⁶ 5. Bus Section	SLG	EHV	No ⁹	No
				HV	Yes	Yes
		6. Loss of multiple elements caused by a stuck breaker ¹⁰ (Bus-tie Breaker) attempting to clear a Fault on the associated bus	SLG	EHV, HV	Yes	Yes
P5 Multiple Contingency (<i>Fault plus relay failure to operate</i>)	Normal System	Delayed Fault Clearing due to the failure of a non-redundant relay ¹³ protecting the Faulted element to operate as designed, for one of the following: 1. Generator 2. Transmission Circuit 3. Transformer ⁵ 4. Shunt Device ⁶ 5. Bus Section	SLG	EHV	No ⁹	No
				HV	Yes	Yes
P6 Multiple Contingency (<i>Two overlapping singles</i>)	Loss of one of the following followed by System adjustments. ⁹ 1. Transmission Circuit 2. Transformer ⁵ 3. Shunt Device ⁶ 4. Single pole of a DC line	Loss of one of the following: 1. Transmission Circuit 2. Transformer ⁵ 3. Shunt Device ⁶	3Ø	EHV, HV	Yes	Yes
		4. Single pole of a DC line	SLG	EHV, HV	Yes	Yes
P7 Multiple Contingency (<i>Common Structure</i>)	Normal System	The loss of: 1. Any two adjacent (vertically or horizontally) circuits on common structure ¹¹ 2. Loss of a bipolar DC line	SLG	EHV, HV	Yes	Yes

APPENDIX E

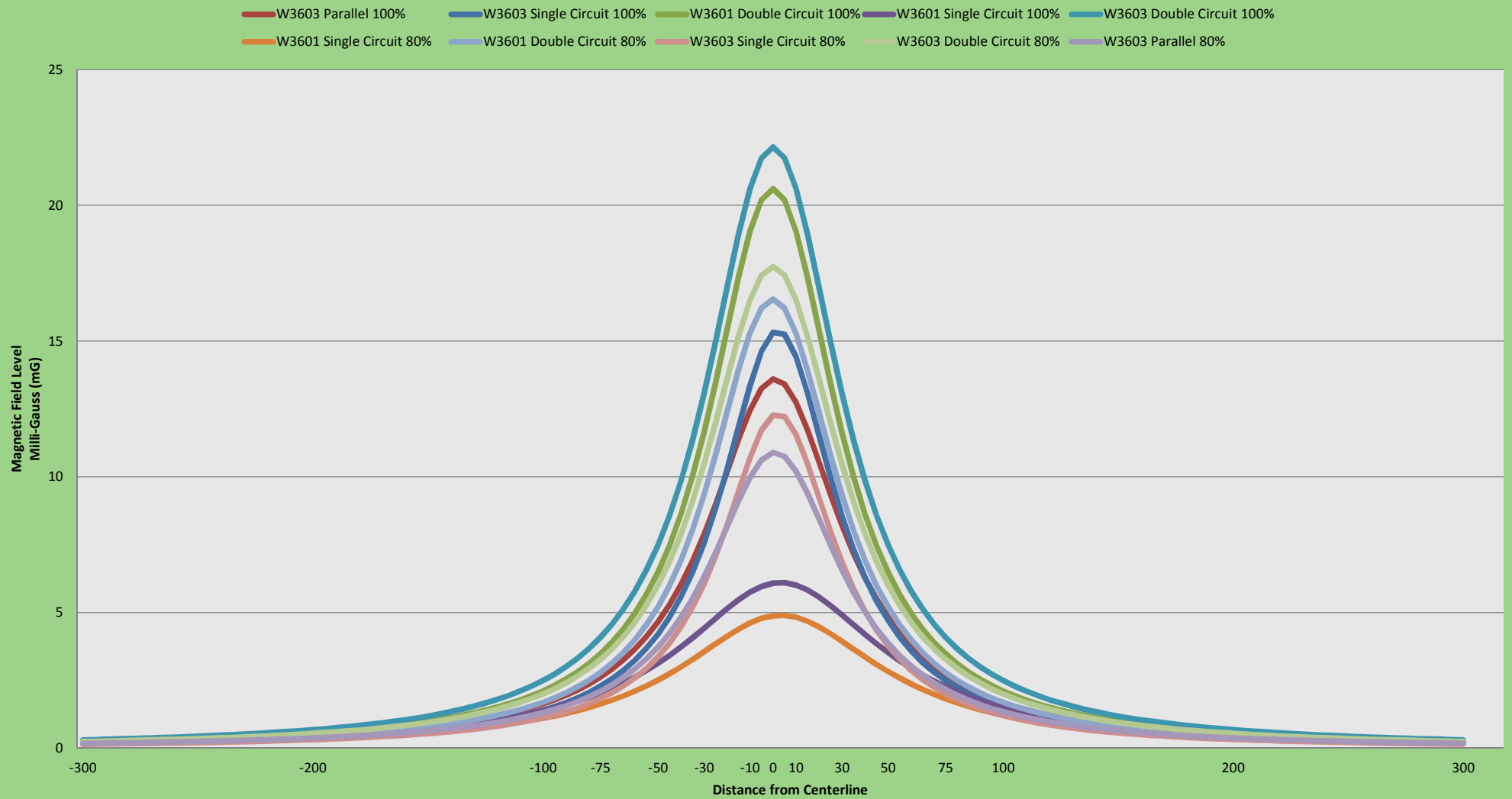
MAGNETIC FIELDS CALCULATIONS

Calculated Electric Fields at Nominal System Voltage

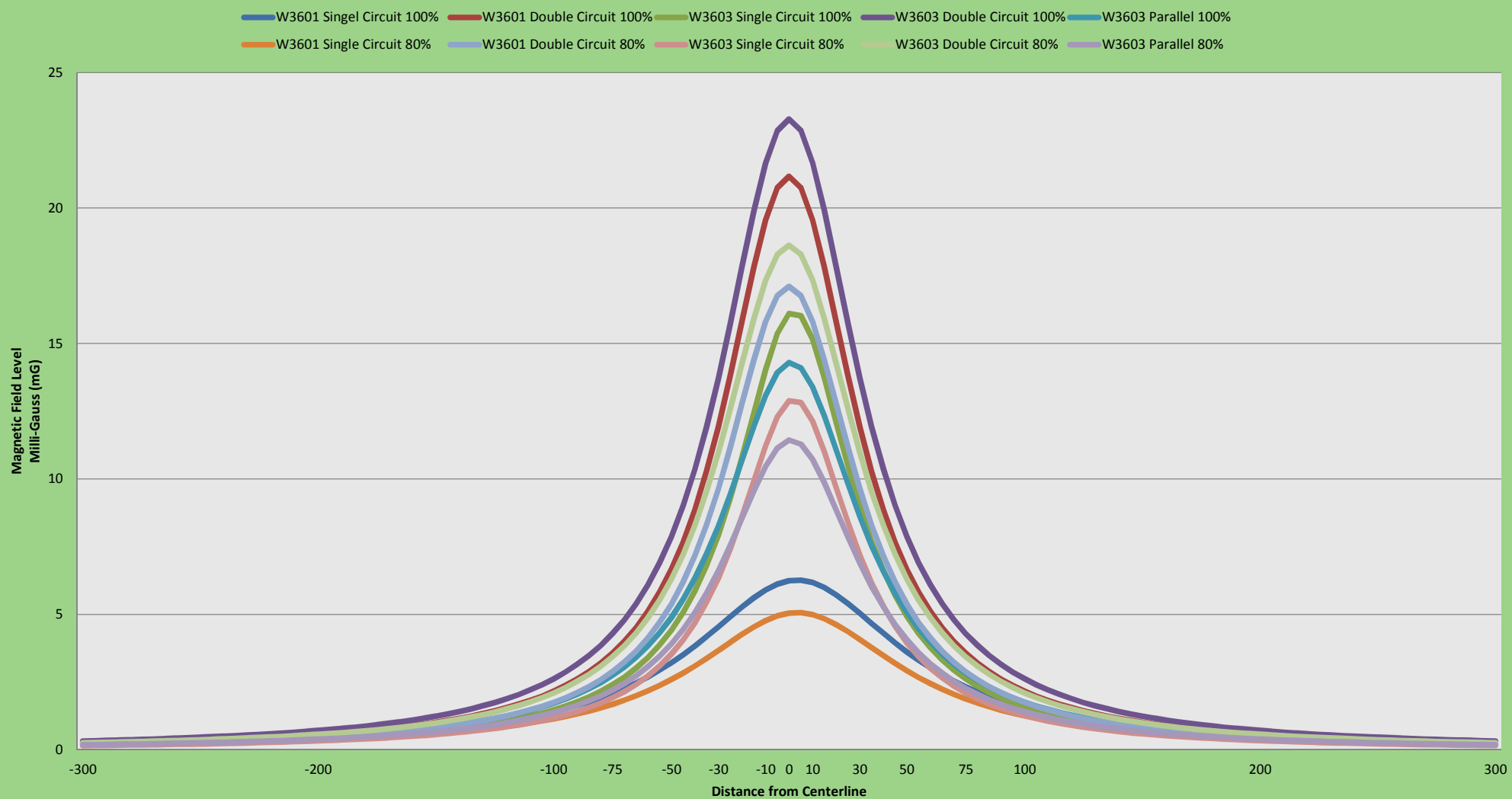
Double Circuit 34.5kV/34.5kV Single Circuit 34.5kV Mono-Pole Parallel Circuit 34.5kV/34.5kV

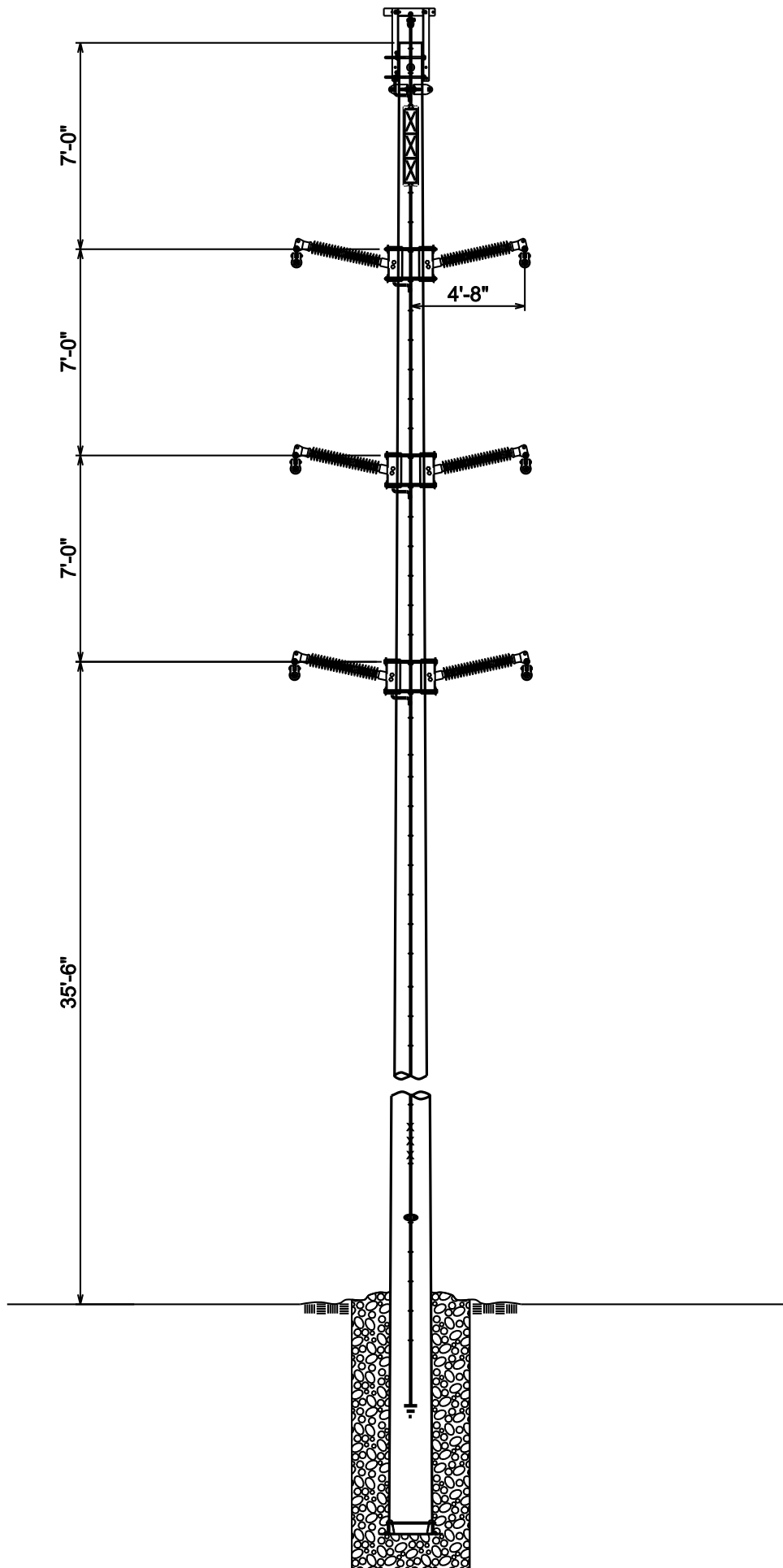


Calculated Magnetic Fields Year 1

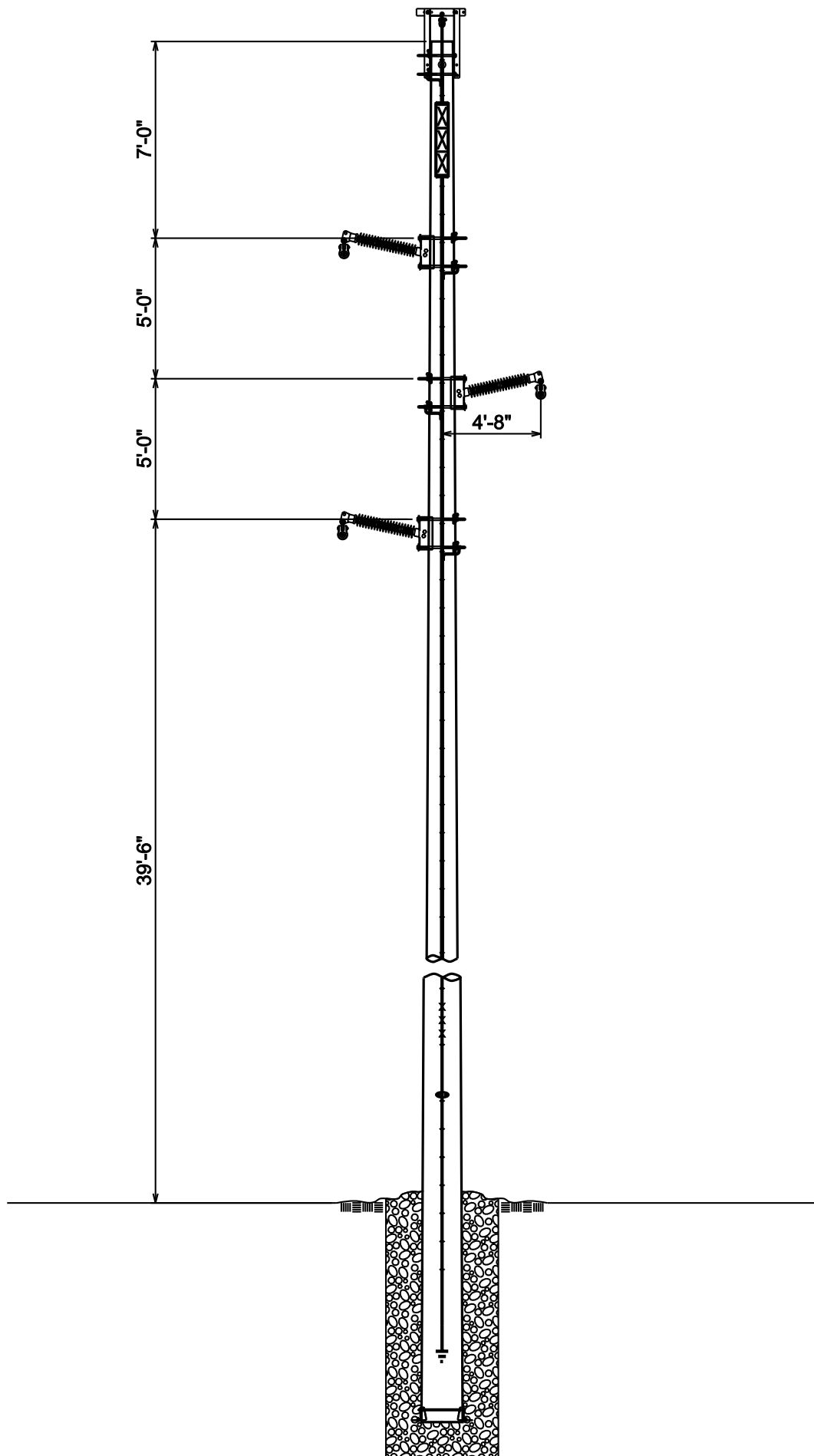


Calculated Magnetic Fields Year 10

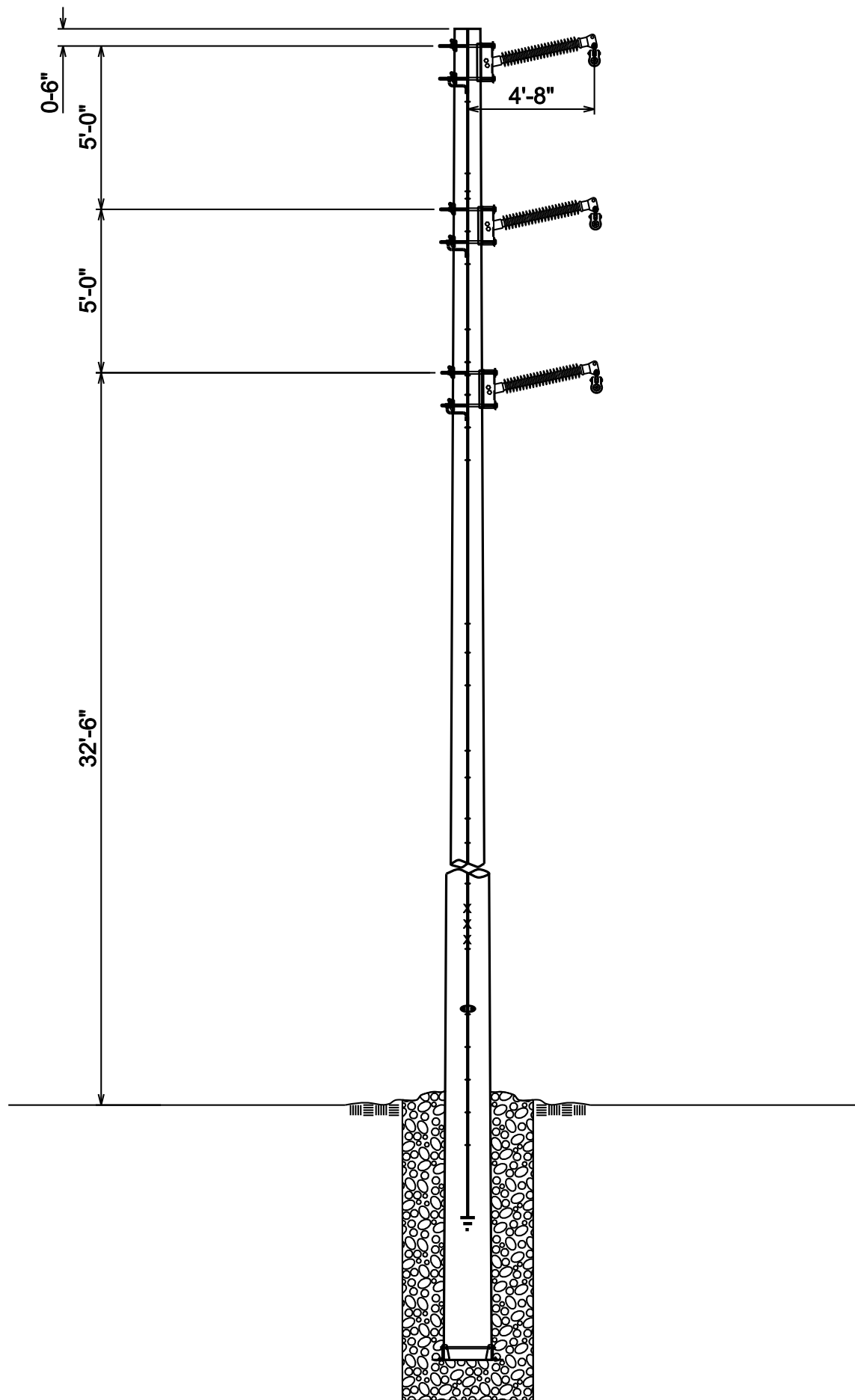




ELEVATION VIEW
TYPICAL 65' POLE



ELEVATION VIEW
TYPICAL 65' POLE



ELEVATION VIEW
TYPICAL 50' POLE

PLS-CADD Version 15.00x64 3:25:09 PM Monday, December 17, 2018
 Sargent & Lundy
 Project Name: 'g:\xcel\w3601_str30(w3315)-str199\w3601_str30(w3315)-str199.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

***** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly *****

***** User may prefer to add other specific load cases utilizing alternative Strength Factors *****

***** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER *****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
 Cross section offset for graph +/-: 300.00 (ft)
 Result interval for graph: 5.00 (ft)
 Electric field limit: 0.00 (kV/m)
 Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure W3601-165 to structure W3601-166

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
5	1	1	34.5	118.000	0	0.858
5	2	1	34.5	118.000	120	0.858
5	3	1	34.5	118.000	-120	0.858
6	1	1	34.5	118.000	0	0.858
6	2	1	34.5	118.000	120	0.858
6	3	1	34.5	118.000	-120	0.858

Calculated EMF Circuit Data For Last Point:

Wire station and offset are based on alignment closest to point on wire.

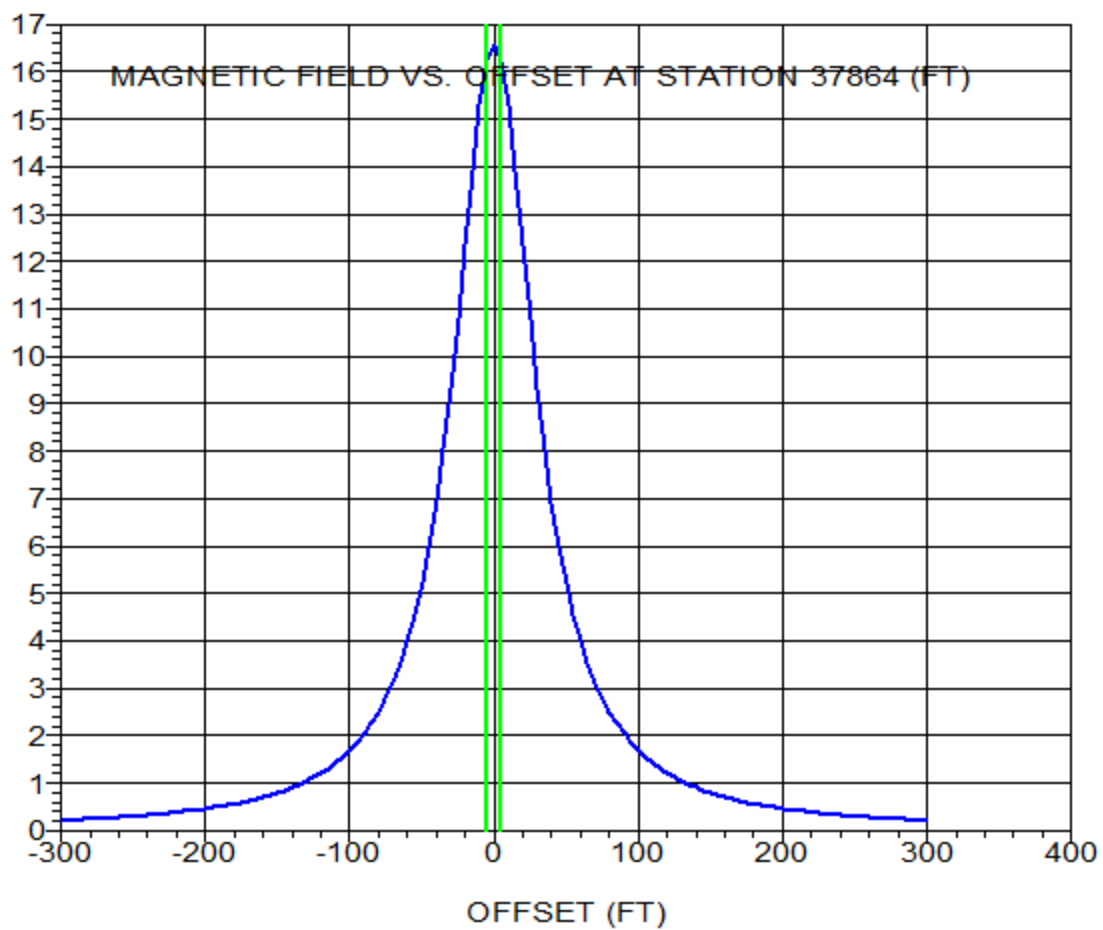
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

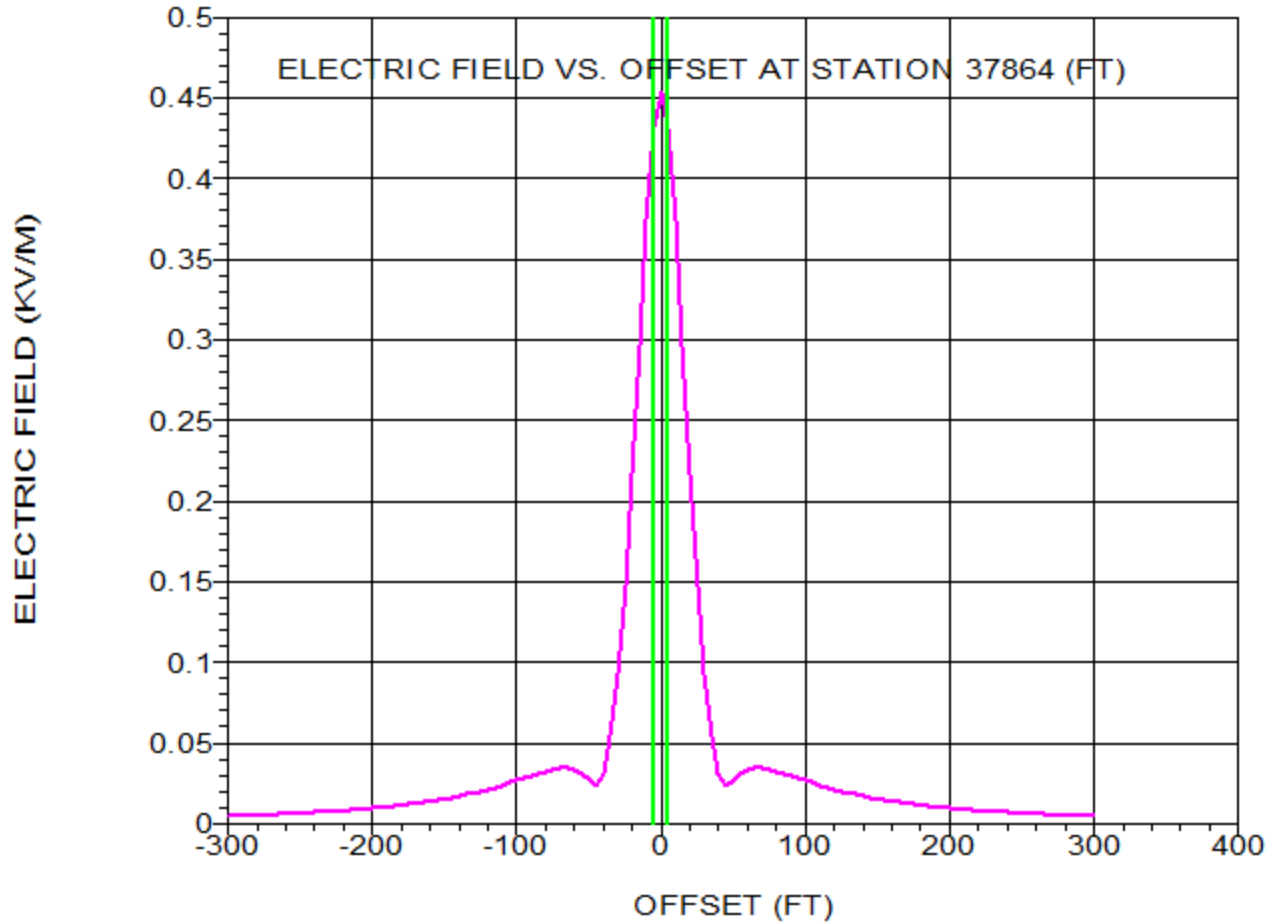
Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Wire Voltage To Gnd. (kV)
5	1	212° F	Max Sag RS	Left	2158368.24	16961511.68	974.81	37864.36	4.60	0.858	19.92
5	2	212° F	Max Sag RS	Left	2158368.24	16961511.68	967.81	37864.36	4.60	0.858	19.92
5	3	212° F	Max Sag RS	Left	2158368.24	16961511.68	960.81	37864.36	4.60	0.858	19.92
6	1	212° F	Max Sag RS	Left	2158359.04	16961511.65	974.80	37864.36	-4.60	0.858	19.92
6	2	212° F	Max Sag RS	Left	2158359.04	16961511.65	967.80	37864.36	-4.60	0.858	19.92
6	3	212° F	Max Sag RS	Left	2158359.04	16961511.65	960.80	37864.36	-4.60	0.858	19.92

Maximum magnetic field of 16.54 (mG) found at station 37864.36, offset 0.00 (ft)

Maximum electric field of 0.453 (kV/m) found at station 37864.36, offset 0.00 (ft)

MAGNETIC FIELD (MG)





EMF Calculation Results:

Station	Offset	X	Y	Z	B Real	B B Img.	B B Phase Angle	B rms Res.	E Real	E E Img.	E E Phase Angle	E Axis Angle	E rms
Res. (deg)	(ft)	(ft)	(ft)	(ft)	(mG)	(mG)	(deg)	(mG)	(kV/m)	(kV/m)	(deg)		

--													
37864.36	-300.00	2158063.64	16961510.89	931.31	0.178	0.10333	30.1	0.206	0.004	0.00105	13.8	88.9	0.004
37864.36	-295.00	2158068.64	16961510.90	931.31	0.184	0.10683	30.1	0.213	0.004	0.00109	13.8	88.9	0.005
37864.36	-290.00	2158073.64	16961510.92	931.31	0.191	0.11051	30.1	0.220	0.005	0.00112	13.8	88.9	0.005
37864.36	-285.00	2158078.64	16961510.93	931.31	0.197	0.11438	30.1	0.228	0.005	0.00116	13.8	88.9	0.005
37864.36	-280.00	2158083.64	16961510.94	931.31	0.204	0.11846	30.1	0.236	0.005	0.00120	13.8	88.8	0.005
37864.36	-275.00	2158088.64	16961510.96	931.31	0.212	0.12275	30.1	0.245	0.005	0.00124	13.7	88.8	0.005
37864.36	-270.00	2158093.64	16961510.97	931.31	0.219	0.12729	30.1	0.254	0.005	0.00128	13.7	88.8	0.005
37864.36	-265.00	2158098.64	16961510.98	931.31	0.228	0.13208	30.1	0.263	0.005	0.00133	13.7	88.8	0.006
37864.36	-260.00	2158103.64	16961510.99	931.31	0.236	0.13715	30.1	0.273	0.006	0.00137	13.7	88.8	0.006
37864.36	-255.00	2158108.64	16961511.01	931.31	0.246	0.14251	30.1	0.284	0.006	0.00142	13.7	88.7	0.006
37864.36	-250.00	2158113.64	16961511.02	931.31	0.255	0.14819	30.1	0.295	0.006	0.00148	13.7	88.7	0.006
37864.36	-245.00	2158118.64	16961511.03	931.31	0.266	0.15421	30.1	0.307	0.006	0.00153	13.7	88.7	0.006
37864.36	-240.00	2158123.64	16961511.05	931.31	0.277	0.16061	30.1	0.320	0.007	0.00159	13.7	88.7	0.007
37864.36	-235.00	2158128.64	16961511.06	931.31	0.288	0.16741	30.1	0.333	0.007	0.00165	13.7	88.7	0.007
37864.36	-230.00	2158133.64	16961511.07	931.31	0.301	0.17465	30.2	0.348	0.007	0.00171	13.7	88.6	0.007
37864.36	-225.00	2158138.64	16961511.08	931.31	0.314	0.18237	30.2	0.363	0.007	0.00178	13.6	88.6	0.008
37864.36	-220.00	2158143.64	16961511.10	931.31	0.328	0.19061	30.2	0.379	0.008	0.00186	13.6	88.6	0.008
37864.36	-215.00	2158148.64	16961511.11	931.31	0.343	0.19942	30.2	0.397	0.008	0.00193	13.6	88.6	0.008
37864.36	-210.00	2158153.64	16961511.12	931.31	0.359	0.20884	30.2	0.415	0.008	0.00201	13.6	88.5	0.009
37864.36	-205.00	2158158.64	16961511.14	931.31	0.376	0.21895	30.2	0.435	0.009	0.00210	13.6	88.5	0.009
37864.36	-200.00	2158163.64	16961511.15	931.31	0.395	0.22980	30.2	0.457	0.009	0.00219	13.6	88.5	0.009
37864.36	-195.00	2158168.64	16961511.16	931.31	0.415	0.24148	30.2	0.480	0.010	0.00229	13.5	88.4	0.010
37864.36	-190.00	2158173.64	16961511.17	931.31	0.436	0.25406	30.2	0.505	0.010	0.00239	13.5	88.4	0.010
37864.36	-185.00	2158178.64	16961511.19	931.31	0.459	0.26763	30.2	0.531	0.010	0.00250	13.5	88.4	0.011
37864.36	-180.00	2158183.64	16961511.20	931.31	0.484	0.28232	30.2	0.560	0.011	0.00262	13.5	88.4	0.011
37864.36	-175.00	2158188.64	16961511.21	931.31	0.511	0.29824	30.3	0.592	0.011	0.00274	13.4	88.3	0.012

37864.36	-170.00	2158193.64	16961511.23	931.31	0.540	0.31553	30.3	0.626	0.012	0.00287	13.4	88.3	0.012
37864.36	-165.00	2158198.64	16961511.24	931.31	0.572	0.33435	30.3	0.663	0.013	0.00301	13.3	88.3	0.013
37864.36	-160.00	2158203.64	16961511.25	931.31	0.607	0.35489	30.3	0.703	0.013	0.00315	13.3	88.2	0.014
37864.36	-155.00	2158208.64	16961511.26	931.31	0.645	0.37736	30.3	0.747	0.014	0.00331	13.2	88.2	0.014
37864.36	-150.00	2158213.64	16961511.28	931.31	0.686	0.40199	30.4	0.796	0.015	0.00348	13.2	88.2	0.015
37864.36	-145.00	2158218.64	16961511.29	931.31	0.732	0.42909	30.4	0.849	0.016	0.00365	13.1	88.1	0.016
37864.36	-140.00	2158223.64	16961511.30	931.31	0.782	0.45898	30.4	0.907	0.017	0.00383	13.0	88.1	0.017
37864.36	-135.00	2158228.64	16961511.32	931.31	0.838	0.49205	30.4	0.971	0.017	0.00403	13.0	88.1	0.018
37864.36	-130.00	2158233.64	16961511.33	931.31	0.899	0.52877	30.5	1.043	0.019	0.00423	12.9	88.1	0.019
37864.36	-125.00	2158238.64	16961511.34	931.31	0.967	0.56966	30.5	1.122	0.020	0.00444	12.7	88.0	0.020
37864.36	-120.00	2158243.64	16961511.35	931.31	1.043	0.61539	30.5	1.211	0.021	0.00465	12.6	88.0	0.021
37864.36	-115.00	2158248.64	16961511.37	931.31	1.128	0.66672	30.6	1.311	0.022	0.00486	12.4	88.0	0.023
37864.36	-110.00	2158253.64	16961511.38	931.31	1.224	0.72459	30.6	1.422	0.023	0.00507	12.2	88.0	0.024
37864.36	-105.00	2158258.64	16961511.39	931.31	1.331	0.79011	30.7	1.548	0.025	0.00526	12.0	88.1	0.025
37864.36	-100.00	2158263.64	16961511.41	931.31	1.453	0.86465	30.8	1.691	0.026	0.00543	11.7	88.1	0.027
37864.36	-95.00	2158268.64	16961511.42	931.31	1.592	0.94988	30.8	1.854	0.028	0.00555	11.3	88.2	0.028
37864.36	-90.00	2158273.64	16961511.43	931.31	1.750	1.04785	30.9	2.040	0.029	0.00560	10.9	88.3	0.030
37864.36	-85.00	2158278.64	16961511.44	931.31	1.932	1.16111	31.0	2.254	0.031	0.00554	10.2	88.5	0.031
37864.36	-80.00	2158283.64	16961511.46	931.31	2.142	1.29283	31.1	2.502	0.032	0.00532	9.4	88.8	0.032
37864.36	-75.00	2158288.64	16961511.47	931.31	2.386	1.44697	31.2	2.790	0.033	0.00485	8.3	89.2	0.033
37864.36	-70.00	2158293.64	16961511.48	931.31	2.669	1.62851	31.4	3.127	0.034	0.00402	6.8	89.8	0.034
37864.36	-65.00	2158298.64	16961511.50	931.31	3.001	1.84375	31.6	3.523	0.034	0.00275	4.6	90.6	0.034
37864.36	-60.00	2158303.64	16961511.51	931.31	3.392	2.10059	31.8	3.990	0.033	0.00177	3.1	91.9	0.033
37864.36	-55.00	2158308.64	16961511.52	931.31	3.854	2.40896	32.0	4.545	0.030	0.00433	8.1	93.8	0.030
37864.36	-50.00	2158313.64	16961511.54	931.31	4.400	2.78112	32.3	5.205	0.025	0.00980	21.1	95.6	0.027
37864.36	-45.00	2158318.64	16961511.55	931.31	5.046	3.23183	32.6	5.993	0.018	0.01833	46.1	90.2	0.024
37864.36	-40.00	2158323.64	16961511.56	931.31	5.810	3.77783	33.0	6.930	0.011	0.03120	71.3	72.3	0.031
37864.36	-35.00	2158328.64	16961511.57	931.31	6.703	4.43600	33.5	8.038	0.023	0.05023	65.0	70.3	0.055
37864.36	-30.00	2158333.64	16961511.59	931.31	7.732	5.21856	34.0	9.329	0.052	0.07763	56.3	72.8	0.093
37864.36	-25.00	2158338.64	16961511.60	931.31	8.883	6.12343	34.6	10.789	0.091	0.11551	51.6	75.4	0.147
37864.36	-20.00	2158343.64	16961511.61	931.31	10.107	7.11851	35.2	12.362	0.141	0.16455	49.4	78.0	0.217
37864.36	-15.00	2158348.64	16961511.63	931.31	11.309	8.12407	35.7	13.925	0.197	0.22173	48.4	80.6	0.296
37864.36	-10.00	2158353.64	16961511.64	931.31	12.344	9.00874	36.1	15.282	0.250	0.27839	48.1	83.5	0.374
37864.36	-5.00	2158358.64	16961511.65	931.31	13.051	9.61918	36.4	16.213	0.289	0.32108	48.0	86.7	0.432
37864.36	0.00	2158363.64	16961511.66	931.31	13.301	9.83666	36.5	16.543	0.303	0.33705	48.0	90.0	0.453
37864.36	5.00	2158368.64	16961511.68	931.31	13.050	9.61833	36.4	16.211	0.289	0.32106	48.0	93.3	0.432
37864.36	10.00	2158373.64	16961511.69	931.31	12.343	9.00739	36.1	15.280	0.250	0.27837	48.1	96.5	0.374
37864.36	15.00	2158378.64	16961511.70	931.31	11.307	8.12265	35.7	13.922	0.197	0.22172	48.4	99.4	0.296
37864.36	20.00	2158383.64	16961511.72	931.31	10.105	7.11727	35.2	12.360	0.141	0.16455	49.4	102.0	0.217
37864.36	25.00	2158388.64	16961511.73	931.31	8.882	6.12247	34.6	10.787	0.091	0.11552	51.6	104.6	0.147
37864.36	30.00	2158393.64	16961511.74	931.31	7.732	5.21786	34.0	9.328	0.052	0.07764	56.3	107.2	0.093
37864.36	35.00	2158398.64	16961511.75	931.31	6.703	4.43550	33.5	8.037	0.023	0.05025	65.0	109.7	0.055
37864.36	40.00	2158403.64	16961511.77	931.31	5.809	3.77748	33.0	6.929	0.011	0.03122	71.3	107.7	0.031
37864.36	45.00	2158408.64	16961511.78	931.31	5.046	3.23158	32.6	5.992	0.018	0.01835	46.1	89.8	0.024
37864.36	50.00	2158413.64	16961511.79	931.31	4.399	2.78095	32.3	5.205	0.025	0.00981	21.2	84.4	0.027
37864.36	55.00	2158418.64	16961511.81	931.31	3.853	2.40884	32.0	4.544	0.030	0.00434	8.2	86.2	0.030
37864.36	60.00	2158423.64	16961511.82	931.31	3.392	2.10050	31.8	3.990	0.033	0.00177	3.1	88.1	0.033
37864.36	65.00	2158428.64	16961511.83	931.31	3.001	1.84369	31.6	3.522	0.034	0.00274	4.6	89.4	0.034
37864.36	70.00	2158433.64	16961511.84	931.31	2.669	1.62847	31.4	3.127	0.034	0.00401	6.8	90.2	0.034
37864.36	75.00	2158438.64	16961511.86	931.31	2.386	1.44693	31.2	2.790	0.033	0.00484	8.3	90.8	0.033
37864.36	80.00	2158443.64	16961511.87	931.31	2.142	1.29280	31.1	2.502	0.032	0.00531	9.4	91.2	0.032
37864.36	85.00	2158448.64	16961511.88	931.31	1.932	1.16109	31.0	2.254	0.031	0.00554	10.2	91.5	0.031
37864.36	90.00	2158453.64	16961511.90	931.31	1.750	1.04783	30.9	2.040	0.029	0.00560	10.9	91.7	0.030
37864.36	95.00	2158458.64	16961511.91	931.31	1.592	0.94986	30.8	1.854	0.028	0.00555	11.3	91.8	0.028
37864.36	100.00	2158463.64	16961511.92	931.31	1.453	0.86464	30.8	1.691	0.026	0.00542	11.7	91.9	0.027
37864.36	105.00	2158468.64	16961511.93	931.31	1.331	0.79010	30.7	1.548	0.025	0.00526	12.0	91.9	0.025
37864.36	110.00	2158473.64	16961511.95	931.31	1.224	0.72458	30.6	1.422	0.023	0.00506	12.2	92.0	0.024
37864.36	115.00	2158478.64	16961511.96	931.31	1.128	0.66672	30.6	1.310	0.022	0.00486	12.4	92.0	0.023
37864.36	120.00	2158483.64	16961511.97	931.31	1.043	0.61539	30.5	1.211	0.021	0.00465	12.6	92.0	0.021
37864.36	125.00	2158488.64	16961511.99	931.31	0.967	0.56966	30.5	1.122	0.020	0.00443	12.7	92.0	0.020
37864.36	130.00	2158493.64	16961512.00	931.31	0.899	0.52876	30.5	1.043	0.019	0.00423	12.9	91.9	0.019
37864.36	135.00	2158498.64	16961512.01	931.31	0.838	0.49205	30.4	0.971	0.017	0.00403	13.0	91.9	0.018
37864.36	140.00	2158503.64	16961512.02	931.31	0.782	0.45898	30.4	0.907	0.017	0.00383	13.0	91.9	0.017
37864.36	145.00	2158508.64	16961512.04	931.31	0.732	0.42909	30.4	0.849	0.016	0.00365	13.1	91.9	0.016
37864.36	150.00	2158513.64	16961512.05	931.31	0.686	0.40199	30.4	0.796	0.015	0.00348	13.2	91.8	0.015
37864.36	155.00	2158518.64	16961512.06	931.31	0.645	0.37735	30.3	0.747	0.014	0.00331	13.2	91.8	0.014
37864.36	160.00	2158523.64	16961512.08	931.31	0.607	0.35489	30.3	0.703	0.013	0.00315	13.3	91.8	0.014
37864.36	165.00	2158528.64	16961512.09	931.31	0.572	0.33435	30.3	0.663	0.013	0.00301	13.3	91.7	0.013
37864.36	170.00	2158533.64	16961512.10	931.31	0.540	0.31553	30.3	0.626	0.012	0.00287	13.4	91.7	0.012
37864.36	175.00	2158538.64	16961512.11	931.31	0.511	0.29824	30.3	0.592	0.011	0.00274	13.4	91.7	0.012
37864.36	180.00	2158543.64	16961512.13	931.31	0.484	0.28232	30.2	0.560	0.011	0.00261	13.5	91.6	0.011
37864.36	185.00	2158548.64	16961512.14	931.31	0.459	0.26763	30.2	0.531	0.010	0.00250	13.5	91.6	0.011
37864.36	190.00	2158553.64	16961512.15	931.31	0.436	0.25405	30.2	0.505	0.010	0.00239	13.5	91.6	0.010
37864.36	195.00	2158558.64	16961512.17	931.31	0.415	0.24148	30.2	0.480	0.010	0.00229	13.5	91.6	0.010
37864.36	200.00	2158563.64	16961512.18	931.31	0.395	0.22980	30.2	0.457	0.009	0.00219	13.6	91.5	0.009
37864.36	205.00	2158568.64	16961512.19	931.31	0.376	0.21895	30.2	0.435	0.009	0.00210	13.6	91.5	0.009
37864.36	210.00	2158573.64	16961512.20	931.31	0.359	0.20884	30.2	0.415	0.008	0.00201	13.6	91.5	

37864.36	235.00	2158598.64	16961512.27	931.31	0.288	0.16741	30.1	0.333	0.007	0.00165	13.7	91.3	0.007
37864.36	240.00	2158603.64	16961512.28	931.31	0.277	0.16061	30.1	0.320	0.007	0.00159	13.7	91.3	0.007
37864.36	245.00	2158608.64	16961512.29	931.31	0.266	0.15421	30.1	0.307	0.006	0.00153	13.7	91.3	0.006
37864.36	250.00	2158613.64	16961512.31	931.31	0.255	0.14819	30.1	0.295	0.006	0.00148	13.7	91.3	0.006
37864.36	255.00	2158618.64	16961512.32	931.31	0.246	0.14251	30.1	0.284	0.006	0.00142	13.7	91.3	0.006
37864.36	260.00	2158623.64	16961512.33	931.31	0.236	0.13715	30.1	0.273	0.006	0.00137	13.7	91.2	0.006
37864.36	265.00	2158628.64	16961512.35	931.31	0.228	0.13208	30.1	0.263	0.005	0.00133	13.7	91.2	0.006
37864.36	270.00	2158633.64	16961512.36	931.31	0.219	0.12729	30.1	0.254	0.005	0.00128	13.7	91.2	0.005
37864.36	275.00	2158638.64	16961512.37	931.31	0.212	0.12275	30.1	0.245	0.005	0.00124	13.7	91.2	0.005
37864.36	280.00	2158643.64	16961512.38	931.31	0.204	0.11846	30.1	0.236	0.005	0.00120	13.8	91.2	0.005
37864.36	285.00	2158648.64	16961512.40	931.31	0.197	0.11438	30.1	0.228	0.005	0.00116	13.8	91.1	0.005
37864.36	290.00	2158653.64	16961512.41	931.31	0.191	0.11051	30.1	0.220	0.005	0.00112	13.8	91.1	0.005
37864.36	295.00	2158658.64	16961512.42	931.31	0.184	0.10683	30.1	0.213	0.004	0.00109	13.8	91.1	0.005
37864.36	300.00	2158663.64	16961512.44	931.31	0.178	0.10333	30.1	0.206	0.004	0.00105	13.8	91.1	0.004

PLS-CADD Version 15.00x64 3:25:57 PM Monday, December 17, 2018
 Sargent & Lundy
 Project Name: 'g:\xcel\w3601_str30(w3315)-str199\w3601_str30(w3315)-str199.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

***** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly *****

***** User may prefer to add other specific load cases utilizing alternative Strength Factors *****

***** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER *****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
 Cross section offset for graph +/-: 300.00 (ft)
 Result interval for graph: 5.00 (ft)
 Electric field limit: 0.00 (kV/m)
 Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure W3315-30 to structure W3601-52

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
5	1	1	34.5	118.000	0	0.858
5	2	1	34.5	118.000	120	0.858
5	3	1	34.5	118.000	-120	0.858

Calculated EMF Circuit Data For Last Point:

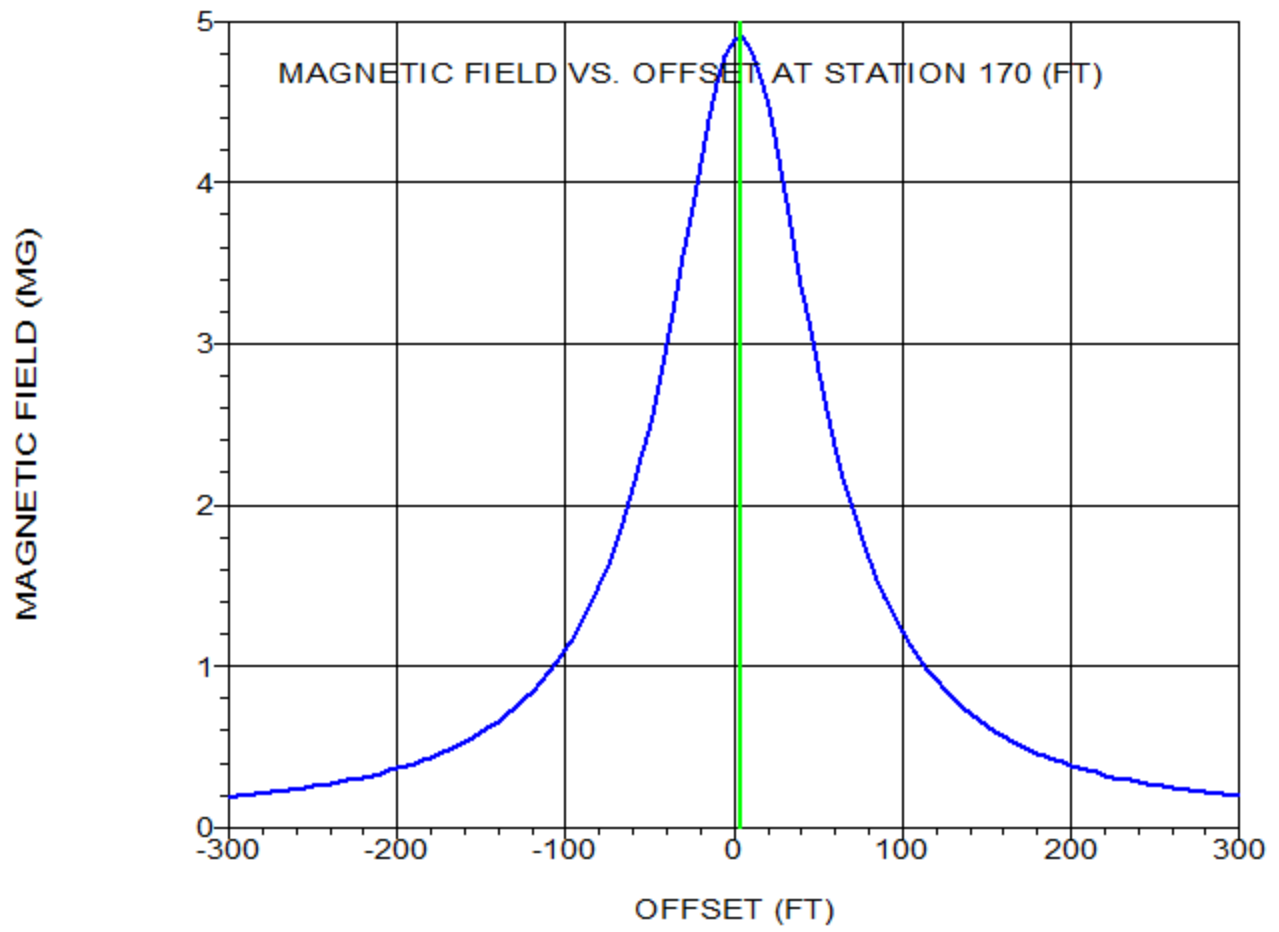
Wire station and offset are based on alignment closest to point on wire.

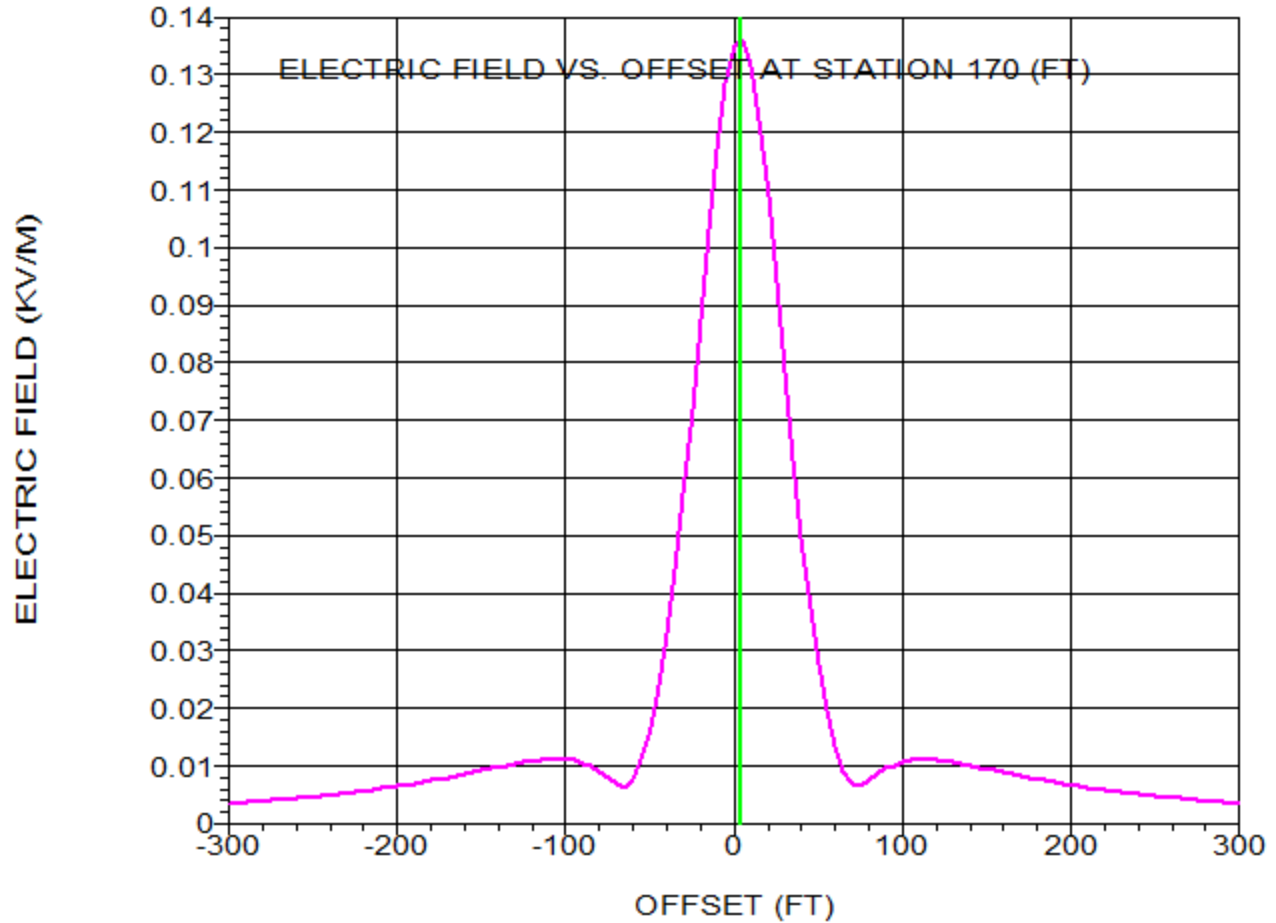
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Wire Eqv. Diameter (in)	Wire Voltage To Gnd. (kV)
5	1	212° F	Max Sag	RS	Left	2150777.69	16931340.34	707.24	169.58	3.39	0.858 19.92
5	2	212° F	Max Sag	RS	Left	2150777.70	16931340.33	696.23	169.57	3.40	0.858 19.92
5	3	212° F	Max Sag	RS	Left	2150777.79	16931340.31	684.74	169.57	3.49	0.858 19.92

Maximum magnetic field of 4.89 (mG) found at station 169.65, offset 5.00 (ft)

Maximum electric field of 0.136 (kV/m) found at station 169.65, offset 5.00 (ft)





EMF Calculation Results:

Station	Offset	X	Y	Z	B	B	B	Phase	B	rms	E	E	E	Phase	E	Axis	E	rms
(ft)	(ft)	(ft)	(ft)	(ft)	Real	Img.	Angle	Angle	Res.	Real	Img.	Angle	Angle	Angle	Angle	Angle	Angle	Res.
					(mG)	(mG)	(deg)	(deg)	(mG)	(kV/m)	(kV/m)	(deg)	(deg)	(deg)	(deg)	(deg)	(deg)	(kV/m)
169.65	-300.00	2150485.41	16931421.68	636.15	0.160	0.09813	31.6	0.187	0.003	0.00102		17.3				89.0	0.003	
169.65	-295.00	2150490.23	16931420.34	636.15	0.164	0.10084	31.6	0.193	0.003	0.00105		17.3				89.0	0.004	
169.65	-290.00	2150495.04	16931419.00	636.15	0.169	0.10368	31.6	0.198	0.003	0.00108		17.3				89.0	0.004	
169.65	-285.00	2150499.86	16931417.66	636.15	0.174	0.10667	31.5	0.204	0.004	0.00111		17.3				89.0	0.004	
169.65	-280.00	2150504.68	16931416.33	636.15	0.179	0.10980	31.5	0.210	0.004	0.00114		17.3				89.0	0.004	
169.65	-275.00	2150509.49	16931414.99	636.15	0.184	0.11310	31.5	0.216	0.004	0.00117		17.3				89.0	0.004	
169.65	-270.00	2150514.31	16931413.65	636.15	0.190	0.11656	31.5	0.223	0.004	0.00121		17.3				88.9	0.004	
169.65	-265.00	2150519.13	16931412.31	636.15	0.196	0.12021	31.5	0.230	0.004	0.00125		17.3				88.9	0.004	
169.65	-260.00	2150523.95	16931410.97	636.15	0.202	0.12405	31.5	0.237	0.004	0.00129		17.2				88.9	0.004	
169.65	-255.00	2150528.76	16931409.63	636.15	0.209	0.12811	31.5	0.245	0.004	0.00132		17.2				88.9	0.004	
169.65	-250.00	2150533.58	16931408.29	636.15	0.216	0.13239	31.5	0.253	0.004	0.00137		17.2				88.9	0.005	
169.65	-245.00	2150538.40	16931406.95	636.15	0.223	0.13691	31.5	0.262	0.005	0.00141		17.2				88.9	0.005	
169.65	-240.00	2150543.21	16931405.61	636.15	0.231	0.14170	31.5	0.271	0.005	0.00145		17.2				88.9	0.005	
169.65	-235.00	2150548.03	16931404.27	636.15	0.239	0.14677	31.5	0.281	0.005	0.00150		17.1				88.9	0.005	
169.65	-230.00	2150552.85	16931402.93	636.15	0.248	0.15214	31.5	0.291	0.005	0.00155		17.1				88.8	0.005	
169.65	-225.00	2150557.67	16931401.59	636.15	0.257	0.15785	31.5	0.302	0.005	0.00160		17.1				88.8	0.005	
169.65	-220.00	2150562.48	16931400.25	636.15	0.267	0.16391	31.5	0.313	0.005	0.00165		17.0				88.8	0.006	
169.65	-215.00	2150567.30	16931398.91	636.15	0.277	0.17036	31.6	0.326	0.006	0.00171		17.0				88.8	0.006	
169.65	-210.00	2150572.12	16931397.57	636.15	0.289	0.17723	31.6	0.339	0.006	0.00176		17.0				88.8	0.006	
169.65	-205.00	2150576.94	16931396.23	636.15	0.300	0.18456	31.6	0.353	0.006	0.00182		16.9				88.8	0.006	
169.65	-200.00	2150581.75	16931394.89	636.15	0.313	0.19239	31.6	0.367	0.006	0.00188		16.9				88.8	0.006	
169.65	-195.00	2150586.57	16931393.55	636.15	0.326	0.20077	31.6	0.383	0.006	0.00194		16.8				88.8	0.007	
169.65	-190.00	2150591.39	16931392.21	636.15	0.341	0.20974	31.6	0.400	0.007	0.00201		16.8				88.8	0.007	
169.65	-185.00	2150596.20	16931390.88	636.15	0.356	0.21936	31.6	0.418	0.007	0.00207		16.7				88.8	0.007	
169.65	-180.00	2150601.02	16931389.54	636.15	0.373	0.22970	31.6	0.438	0.007	0.00214		16.6				88.8	0.007	
169.65	-175.00	2150605.84	16931388.20	636.15	0.391	0.24082	31.7	0.459	0.007	0.00221		16.6				88.8	0.008	
169.65	-170.00	2150610.66	16931386.86	636.15	0.410	0.25282	31.7	0.481	0.008	0.00227		16.5				88.8	0.008	
169.65	-165.00	2150615.47	16931385.52	636.15	0.430	0.26577	31.7	0.506	0.008	0.00234		16.4				88.8	0.008	
169.65	-160.00	2150620.29	16931384.18	636.15	0.452	0.27978	31.7	0.532	0.008	0.00241		16.2				88.8	0.009	

169.65	-155.00	2150625.11	16931382.84	636.15	0.476	0.29496	31.8	0.560	0.009	0.00247	16.1	88.8	0.009
169.65	-150.00	2150629.93	16931381.50	636.15	0.502	0.31145	31.8	0.591	0.009	0.00253	15.9	88.9	0.009
169.65	-145.00	2150634.74	16931380.16	636.15	0.531	0.32938	31.8	0.624	0.009	0.00258	15.8	88.9	0.010
169.65	-140.00	2150639.56	16931378.82	636.15	0.561	0.34893	31.9	0.661	0.009	0.00263	15.5	89.0	0.010
169.65	-135.00	2150644.38	16931377.48	636.15	0.594	0.37029	31.9	0.700	0.010	0.00266	15.3	89.0	0.010
169.65	-130.00	2150649.19	16931376.14	636.15	0.631	0.39367	32.0	0.743	0.010	0.00268	15.0	89.1	0.010
169.65	-125.00	2150654.01	16931374.80	636.15	0.670	0.41933	32.0	0.791	0.010	0.00268	14.6	89.2	0.011
169.65	-120.00	2150658.83	16931373.46	636.15	0.713	0.44754	32.1	0.842	0.011	0.00266	14.1	89.4	0.011
169.65	-115.00	2150663.65	16931372.12	636.15	0.761	0.47865	32.2	0.899	0.011	0.00259	13.6	89.5	0.011
169.65	-110.00	2150668.46	16931370.78	636.15	0.813	0.51301	32.3	0.961	0.011	0.00249	12.9	89.8	0.011
169.65	-105.00	2150673.28	16931369.44	636.15	0.870	0.55107	32.3	1.030	0.011	0.00232	12.0	90.1	0.011
169.65	-100.00	2150678.10	16931368.10	636.15	0.933	0.59331	32.4	1.106	0.011	0.00208	10.8	90.4	0.011
169.65	-95.00	2150682.92	16931366.77	636.15	1.003	0.64031	32.6	1.190	0.011	0.00175	9.2	90.9	0.011
169.65	-90.00	2150687.73	16931365.43	636.15	1.080	0.69272	32.7	1.283	0.010	0.00130	7.1	91.6	0.011
169.65	-85.00	2150692.55	16931364.09	636.15	1.165	0.75127	32.8	1.386	0.010	0.00077	4.4	92.5	0.010
169.65	-80.00	2150697.37	16931362.75	636.15	1.259	0.81681	33.0	1.501	0.009	0.00063	4.0	93.7	0.009
169.65	-75.00	2150702.18	16931361.41	636.15	1.363	0.89028	33.2	1.628	0.008	0.00155	11.0	95.0	0.008
169.65	-70.00	2150707.00	16931360.07	636.15	1.478	0.97270	33.3	1.770	0.006	0.00299	25.0	95.4	0.007
169.65	-65.00	2150711.82	16931358.73	636.15	1.606	1.06521	33.6	1.927	0.004	0.00490	48.2	90.0	0.006
169.65	-60.00	2150716.64	16931357.39	636.15	1.747	1.16895	33.8	2.102	0.002	0.00738	72.5	78.8	0.007
169.65	-55.00	2150721.45	16931356.05	636.15	1.902	1.28507	34.0	2.295	0.003	0.01057	71.8	75.5	0.011
169.65	-50.00	2150726.27	16931354.71	636.15	2.072	1.41456	34.3	2.509	0.008	0.01462	62.2	76.5	0.016
169.65	-45.00	2150731.09	16931353.37	636.15	2.256	1.55806	34.6	2.742	0.013	0.01971	55.8	78.0	0.024
169.65	-40.00	2150735.90	16931352.03	636.15	2.455	1.71563	35.0	2.995	0.020	0.02599	52.0	79.4	0.033
169.65	-35.00	2150740.72	16931350.69	636.15	2.665	1.88629	35.3	3.265	0.029	0.03360	49.6	80.5	0.044
169.65	-30.00	2150745.54	16931349.35	636.15	2.884	2.06753	35.6	3.548	0.038	0.04256	48.1	81.6	0.057
169.65	-25.00	2150750.36	16931348.01	636.15	3.105	2.25478	36.0	3.837	0.049	0.05275	47.3	82.7	0.072
169.65	-20.00	2150755.17	16931346.67	636.15	3.320	2.44082	36.3	4.121	0.060	0.06378	46.9	83.8	0.087
169.65	-15.00	2150759.99	16931345.33	636.15	3.519	2.61568	36.6	4.384	0.071	0.07495	46.7	84.9	0.103
169.65	-10.00	2150764.81	16931343.99	636.15	3.688	2.76705	36.9	4.611	0.080	0.08523	46.7	86.2	0.117
169.65	-5.00	2150769.63	16931342.65	636.15	3.815	2.88176	37.1	4.781	0.088	0.09342	46.7	87.6	0.128
169.65	-0.00	2150774.44	16931341.32	636.15	3.887	2.94811	37.2	4.879	0.092	0.09835	46.8	89.0	0.135
169.65	5.00	2150779.26	16931339.98	636.15	3.899	2.95860	37.2	4.894	0.093	0.09926	46.8	90.4	0.136
169.65	10.00	2150784.08	16931338.64	636.15	3.848	2.91197	37.1	4.826	0.090	0.09599	46.8	91.9	0.132
169.65	15.00	2150788.89	16931337.30	636.15	3.740	2.81353	37.0	4.680	0.084	0.08909	46.8	93.2	0.122
169.65	20.00	2150793.71	16931335.96	636.15	3.585	2.67371	36.7	4.472	0.075	0.07959	46.8	94.5	0.109
169.65	25.00	2150798.53	16931334.62	636.15	3.395	2.50548	36.4	4.219	0.064	0.06871	47.0	95.7	0.094
169.65	30.00	2150803.35	16931333.28	636.15	3.184	2.32172	36.1	3.940	0.053	0.05758	47.4	96.8	0.078
169.65	35.00	2150808.16	16931331.94	636.15	2.963	2.13340	35.8	3.651	0.042	0.04702	48.1	97.9	0.063
169.65	40.00	2150812.98	16931330.60	636.15	2.742	1.94879	35.4	3.364	0.032	0.03755	49.3	98.9	0.050
169.65	45.00	2150817.80	16931329.26	636.15	2.528	1.77342	35.1	3.088	0.024	0.02939	51.3	100.0	0.038
169.65	50.00	2150822.62	16931327.92	636.15	2.324	1.61049	34.7	2.827	0.016	0.02257	54.6	101.2	0.028
169.65	55.00	2150827.43	16931326.58	636.15	2.134	1.46149	34.4	2.586	0.010	0.01701	59.9	102.6	0.020
169.65	60.00	2150832.25	16931325.24	636.15	1.958	1.32669	34.1	2.365	0.005	0.01254	68.2	103.8	0.013
169.65	65.00	2150837.07	16931323.90	636.15	1.797	1.20560	33.9	2.164	0.002	0.00899	76.5	103.0	0.009
169.65	70.00	2150841.88	16931322.56	636.15	1.651	1.09734	33.6	1.983	0.003	0.00622	61.3	95.5	0.007
169.65	75.00	2150846.70	16931321.22	636.15	1.519	1.00078	33.4	1.819	0.006	0.00406	36.3	86.7	0.007
169.65	80.00	2150851.52	16931319.88	636.15	1.399	0.91477	33.2	1.671	0.007	0.00240	18.3	85.0	0.008
169.65	85.00	2150856.34	16931318.54	636.15	1.290	0.83814	33.0	1.539	0.009	0.00118	7.8	86.0	0.009
169.65	90.00	2150861.15	16931317.20	636.15	1.193	0.76984	32.8	1.420	0.010	0.00051	3.1	87.1	0.010
169.65	95.00	2150865.97	16931315.87	636.15	1.104	0.70888	32.7	1.312	0.010	0.00084	4.7	88.1	0.010
169.65	100.00	2150870.79	16931314.53	636.15	1.025	0.65437	32.6	1.216	0.011	0.00133	7.2	88.8	0.011
169.65	105.00	2150875.60	16931313.19	636.15	0.953	0.60554	32.4	1.129	0.011	0.00172	9.1	89.4	0.011
169.65	110.00	2150880.42	16931311.85	636.15	0.887	0.56170	32.3	1.050	0.011	0.00201	10.5	89.8	0.011
169.65	115.00	2150885.24	16931310.51	636.15	0.828	0.52225	32.2	0.979	0.011	0.00221	11.6	90.1	0.011
169.65	120.00	2150890.06	16931309.17	636.15	0.774	0.48668	32.2	0.914	0.011	0.00236	12.4	90.4	0.011
169.65	125.00	2150894.87	16931307.83	636.15	0.725	0.45452	32.1	0.856	0.010	0.00245	13.1	90.6	0.011
169.65	130.00	2150899.69	16931306.49	636.15	0.681	0.42538	32.0	0.803	0.010	0.00250	13.7	90.7	0.011
169.65	135.00	2150904.51	16931305.15	636.15	0.640	0.39891	31.9	0.754	0.010	0.00252	14.1	90.8	0.010
169.65	140.00	2150909.33	16931303.81	636.15	0.603	0.37482	31.9	0.710	0.010	0.00252	14.5	90.9	0.010
169.65	145.00	2150914.14	16931302.47	636.15	0.568	0.35283	31.8	0.669	0.009	0.00249	14.8	91.0	0.010
169.65	150.00	2150918.96	16931301.13	636.15	0.537	0.33273	31.8	0.632	0.009	0.00246	15.0	91.1	0.009
169.65	155.00	2150923.78	16931299.79	636.15	0.508	0.31432	31.7	0.597	0.009	0.00242	15.3	91.1	0.009
169.65	160.00	2150928.59	16931298.45	636.15	0.481	0.29740	31.7	0.566	0.009	0.00237	15.4	91.2	0.009
169.65	165.00	2150933.41	16931297.11	636.15	0.457	0.28184	31.7	0.537	0.008	0.00231	15.6	91.2	0.009
169.65	170.00	2150938.23	16931295.77	636.15	0.434	0.26750	31.6	0.510	0.008	0.00225	15.7	91.2	0.008
169.65	175.00	2150943.05	16931294.43	636.15	0.413	0.25425	31.6	0.485	0.008	0.00219	15.9	91.2	0.008
169.65	180.00	2150947.86	16931293.09	636.15	0.394	0.24200	31.6	0.462	0.007	0.00213	16.0	91.2	0.008
169.65	185.00	2150952.68	16931291.76	636.15	0.375	0.23064	31.6	0.441	0.007	0.00206	16.1	91.2	0.007
169.65	190.00	2150957.50	16931290.42	636.15	0.358	0.22009	31.5	0.421	0.007	0.00200	16.2	91.2	0.007
169.65	195.00	2150962.32	16931289.08	636.15	0.343	0.21029	31.5	0.402	0.007	0.00194	16.2	91.2	0.007
169.65	200.00	2150967.13	16931287.74	636.15	0.328	0.20115	31.5	0.385	0.006	0.00188	16.3	91.2	0.007
169.65	205.00	2150971.95	16931286.40	636.15	0.314	0.19263	31.5	0.369	0.006	0.00182	16.4	91.2	0.006
169.65	210.00	2150976.77	16931285.06	636.15	0.301	0.18467	31.5	0.354	0.006	0.00176	16.4	91.2	0.006
169.65	215.00	2150981.58	16931283.72	636.15	0.289	0.17723	31.5	0.339	0.006	0.00171	16.5	91.2	0.006
169.65	220.00	2150986.40	16931282.38	636.15	0.278	0.17025	31.5	0.326	0.006	0.00165	16.5	91.2	0.006
169.65	225.00	2150991.22	16931281.04	636.15	0.268	0.16371	31.5	0.314	0.005	0.00160	16.5	91.2	0.006
169.65	230.00	2150996.04	16931279.70	636.15	0.258	0.15757	31.5	0.302	0.005	0.00155	16.6	91.2	0.005

169.65	250.00	2151015.30	16931274.34	636.15	0.223	0.13639	31.4	0.262	0.005	0.00136	16.7	91.1	0.005
169.65	255.00	2151020.12	16931273.00	636.15	0.216	0.13182	31.4	0.253	0.004	0.00132	16.7	91.1	0.005
169.65	260.00	2151024.94	16931271.66	636.15	0.209	0.12750	31.4	0.244	0.004	0.00128	16.7	91.1	0.004
169.65	265.00	2151029.76	16931270.32	636.15	0.202	0.12341	31.4	0.237	0.004	0.00124	16.8	91.1	0.004
169.65	270.00	2151034.57	16931268.98	636.15	0.196	0.11954	31.4	0.229	0.004	0.00120	16.8	91.1	0.004
169.65	275.00	2151039.39	16931267.64	636.15	0.190	0.11586	31.4	0.222	0.004	0.00117	16.8	91.1	0.004
169.65	280.00	2151044.21	16931266.31	636.15	0.184	0.11237	31.4	0.215	0.004	0.00113	16.8	91.1	0.004
169.65	285.00	2151049.03	16931264.97	636.15	0.178	0.10906	31.4	0.209	0.004	0.00110	16.8	91.0	0.004
169.65	290.00	2151053.84	16931263.63	636.15	0.173	0.10591	31.4	0.203	0.004	0.00107	16.8	91.0	0.004
169.65	295.00	2151058.66	16931262.29	636.15	0.168	0.10291	31.4	0.197	0.003	0.00104	16.9	91.0	0.004
169.65	300.00	2151063.48	16931260.95	636.15	0.164	0.10005	31.4	0.192	0.003	0.00101	16.9	91.0	0.003

PLS-CADD Version 15.00x64 4:06:15 PM Monday, December 17, 2018
 Sargent & Lundy
 Project Name: 'g:\xcel\w3603_str199(w3601)-byf_tp\w3606_str199(w3601)-byf_tp.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

**** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****

**** User may prefer to add other specific load cases utilizing alternative Strength Factors ****

**** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
 Cross section offset for graph +/-: 300.00 (ft)
 Result interval for graph: 5.00 (ft)
 Electric field limit: 0.00 (kV/m)
 Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure W3603-72 to structure W3603-73

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
5	1	1	34.5	141.000	0	0.858
5	2	1	34.5	141.000	120	0.858
5	3	1	34.5	141.000	-120	0.858
6	1	1	34.5	141.000	0	0.858
6	2	1	34.5	141.000	120	0.858
6	3	1	34.5	141.000	-120	0.858

Calculated EMF Circuit Data For Last Point:

Wire station and offset are based on alignment closest to point on wire.

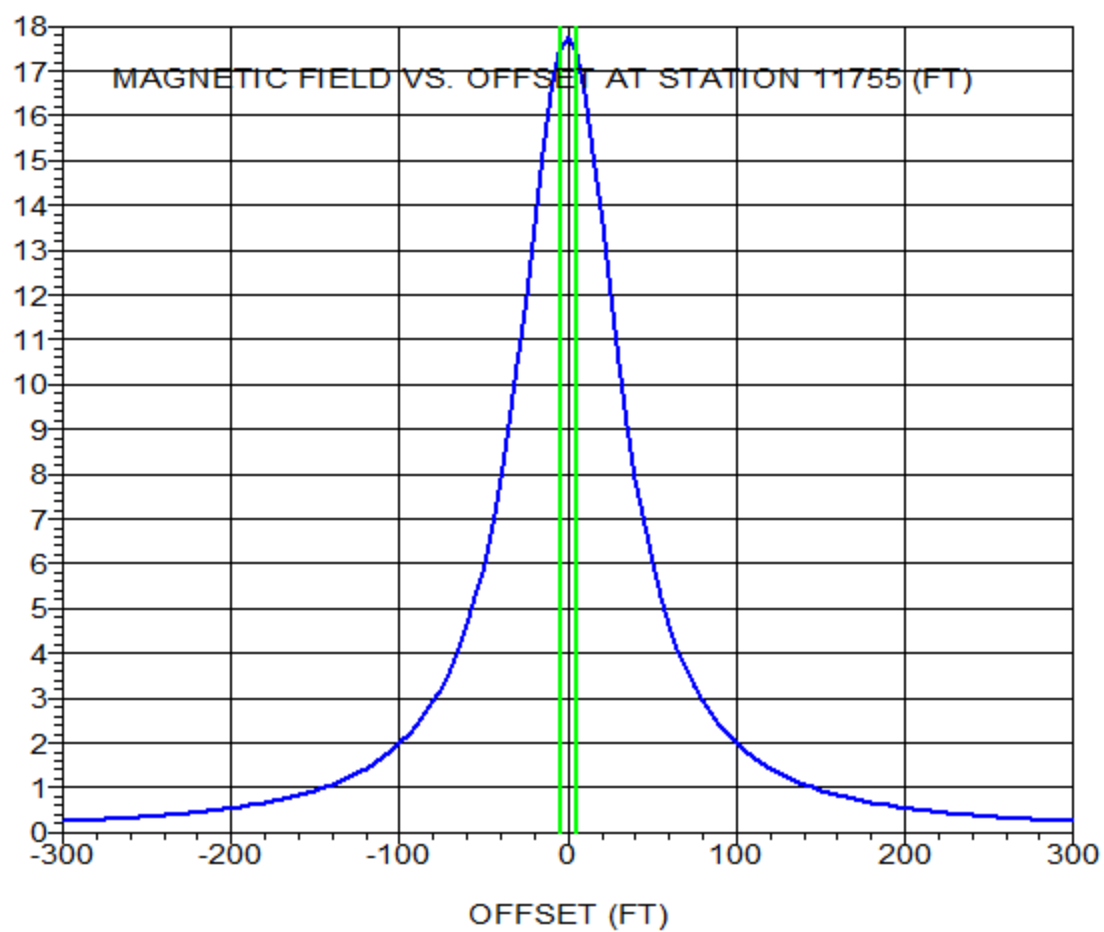
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

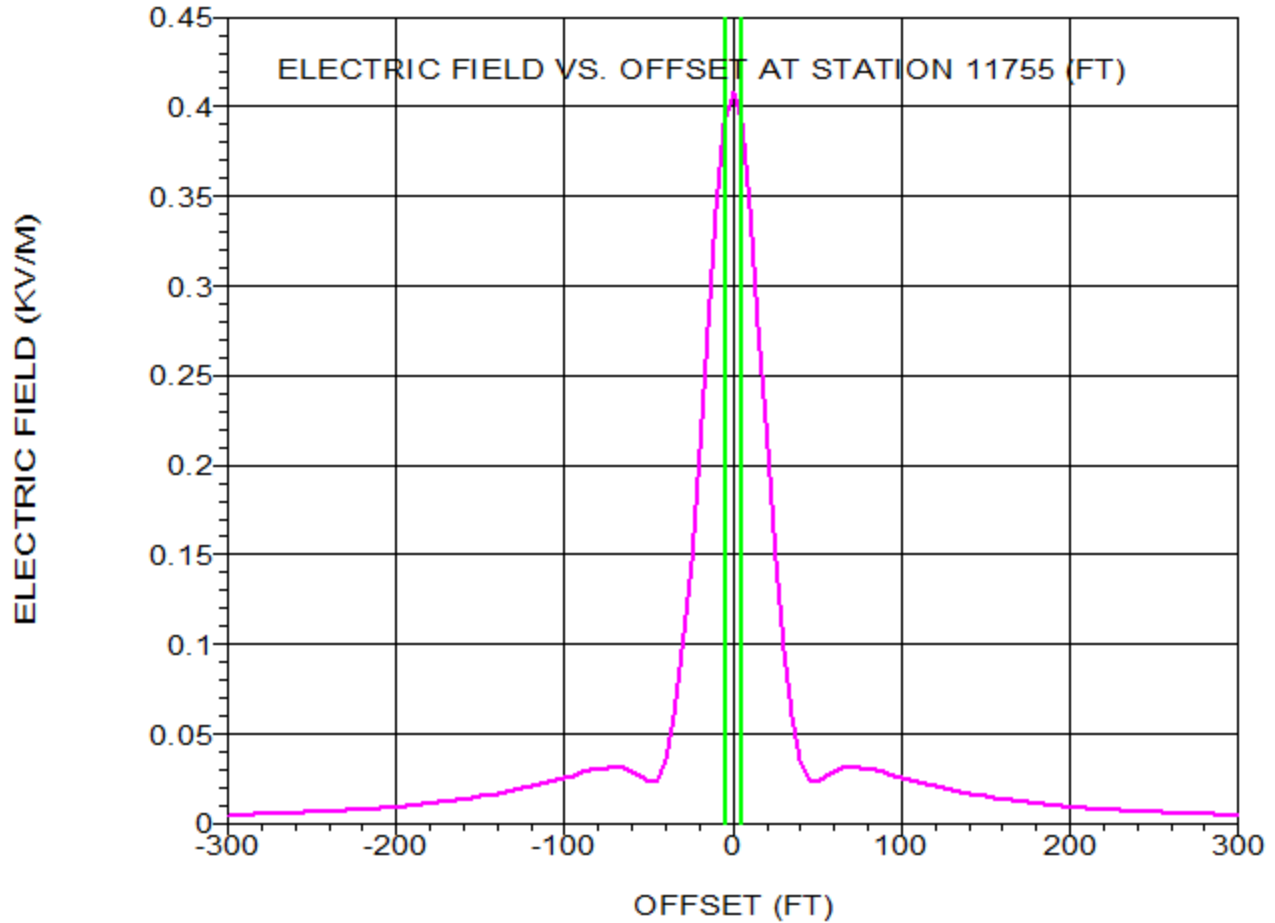
Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Wire Voltage To Gnd. (kV)
5	1	212° F	Max Sag	RS	Left	2165832.35	16978350.78	834.70	11754.48	4.63	19.92
5	2	212° F	Max Sag	RS	Left	2165832.35	16978350.78	827.70	11754.48	4.63	19.92
5	3	212° F	Max Sag	RS	Left	2165832.35	16978350.78	820.70	11754.48	4.63	19.92
6	1	212° F	Max Sag	RS	Left	2165823.15	16978350.56	834.68	11754.48	-4.57	19.92
6	2	212° F	Max Sag	RS	Left	2165823.15	16978350.56	827.68	11754.48	-4.57	19.92
6	3	212° F	Max Sag	RS	Left	2165823.15	16978350.56	820.68	11754.48	-4.57	19.92

Maximum magnetic field of 17.74 (mG) found at station 11754.48, offset 0.00 (ft)

Maximum electric field of 0.409 (kV/m) found at station 11754.48, offset 0.00 (ft)

MAGNETIC FIELD (MG)





EMF Calculation Results:

Station	Offset	X	Y	Z	B	B	B Phase	B rms	E	E	E Phase	E Axis	E rms
Res.					Real	Img.	Angle	Res.	Real	Img.	Angle	Angle	
(ft)	(ft)	(ft)	(ft)	(ft)	(mG)	(mG)	(deg)	(mG)	(kV/m)	(kV/m)	(deg)		
(deg)(kV/m)													

11754.53	-300.00	2165527.80	16978343.73	789.30	0.213	0.12329	30.1	0.246	0.004	0.00102	13.3	88.9	0.004
11754.53	-295.00	2165532.80	16978343.85	789.30	0.220	0.12746	30.1	0.254	0.004	0.00105	13.3	88.9	0.005
11754.53	-290.00	2165537.80	16978343.97	789.30	0.227	0.13184	30.1	0.263	0.005	0.00108	13.3	88.9	0.005
11754.53	-285.00	2165542.79	16978344.08	789.30	0.235	0.13645	30.1	0.272	0.005	0.00112	13.3	88.9	0.005
11754.53	-280.00	2165547.79	16978344.20	789.30	0.244	0.14131	30.1	0.282	0.005	0.00115	13.2	88.8	0.005
11754.53	-275.00	2165552.79	16978344.31	789.30	0.252	0.14643	30.1	0.292	0.005	0.00119	13.2	88.8	0.005
11754.53	-270.00	2165557.79	16978344.43	789.30	0.262	0.15183	30.1	0.303	0.005	0.00123	13.2	88.8	0.005
11754.52	-265.00	2165562.79	16978344.54	789.30	0.272	0.15753	30.1	0.314	0.005	0.00128	13.2	88.8	0.006
11754.52	-260.00	2165567.79	16978344.66	789.30	0.282	0.16356	30.1	0.326	0.006	0.00132	13.2	88.8	0.006
11754.52	-255.00	2165572.79	16978344.77	789.30	0.293	0.16994	30.1	0.339	0.006	0.00137	13.2	88.8	0.006
11754.52	-250.00	2165577.78	16978344.89	789.30	0.304	0.17670	30.1	0.352	0.006	0.00142	13.2	88.7	0.006
11754.52	-245.00	2165582.78	16978345.01	789.30	0.317	0.18387	30.1	0.366	0.006	0.00147	13.2	88.7	0.006
11754.52	-240.00	2165587.78	16978345.12	789.30	0.330	0.19148	30.1	0.381	0.007	0.00152	13.2	88.7	0.007
11754.52	-235.00	2165592.78	16978345.24	789.30	0.344	0.19958	30.2	0.397	0.007	0.00158	13.1	88.7	0.007
11754.52	-230.00	2165597.78	16978345.35	789.30	0.358	0.20819	30.2	0.414	0.007	0.00164	13.1	88.6	0.007
11754.52	-225.00	2165602.78	16978345.47	789.30	0.374	0.21737	30.2	0.433	0.007	0.00171	13.1	88.6	0.008
11754.52	-220.00	2165607.78	16978345.58	789.30	0.391	0.22716	30.2	0.452	0.008	0.00177	13.1	88.6	0.008
11754.52	-215.00	2165612.78	16978345.70	789.30	0.409	0.23763	30.2	0.473	0.008	0.00185	13.1	88.6	0.008
11754.52	-210.00	2165617.77	16978345.81	789.30	0.428	0.24883	30.2	0.495	0.008	0.00192	13.0	88.5	0.009
11754.52	-205.00	2165622.77	16978345.93	789.30	0.448	0.26084	30.2	0.519	0.009	0.00200	13.0	88.5	0.009
11754.51	-200.00	2165627.77	16978346.05	789.30	0.470	0.27373	30.2	0.544	0.009	0.00209	13.0	88.5	0.009
11754.51	-195.00	2165632.77	16978346.16	789.30	0.494	0.28759	30.2	0.571	0.009	0.00218	13.0	88.5	0.010
11754.51	-190.00	2165637.77	16978346.28	789.30	0.519	0.30252	30.2	0.601	0.010	0.00227	12.9	88.4	0.010
11754.51	-185.00	2165642.77	16978346.39	789.30	0.546	0.31863	30.2	0.633	0.010	0.00237	12.9	88.4	0.011
11754.51	-180.00	2165647.77	16978346.51	789.30	0.576	0.33606	30.3	0.667	0.011	0.00248	12.8	88.4	0.011
11754.51	-175.00	2165652.76	16978346.62	789.30	0.608	0.35493	30.3	0.704	0.011	0.00259	12.8	88.3	0.012

11754.51	-170.00	2165657.76	16978346.74	789.30	0.643	0.37542	30.3	0.744	0.012	0.00271	12.8	88.3	0.012
11754.51	-165.00	2165662.76	16978346.85	789.30	0.680	0.39772	30.3	0.788	0.013	0.00283	12.7	88.3	0.013
11754.51	-160.00	2165667.76	16978346.97	789.30	0.721	0.42204	30.3	0.836	0.013	0.00296	12.6	88.3	0.014
11754.51	-155.00	2165672.76	16978347.09	789.30	0.766	0.44862	30.3	0.888	0.014	0.00310	12.6	88.2	0.014
11754.51	-150.00	2165677.76	16978347.20	789.30	0.815	0.47776	30.4	0.945	0.015	0.00325	12.5	88.2	0.015
11754.51	-145.00	2165682.76	16978347.32	789.30	0.869	0.50979	30.4	1.008	0.015	0.00340	12.4	88.2	0.016
11754.51	-140.00	2165687.76	16978347.43	789.30	0.928	0.54509	30.4	1.077	0.016	0.00356	12.3	88.2	0.017
11754.50	-135.00	2165692.75	16978347.55	789.30	0.994	0.58412	30.4	1.153	0.017	0.00372	12.2	88.1	0.018
11754.50	-130.00	2165697.75	16978347.66	789.30	1.066	0.62740	30.5	1.237	0.018	0.00388	12.1	88.1	0.019
11754.50	-125.00	2165702.75	16978347.78	789.30	1.146	0.67557	30.5	1.330	0.019	0.00405	11.9	88.1	0.020
11754.50	-120.00	2165707.75	16978347.90	789.30	1.235	0.72937	30.6	1.435	0.020	0.00422	11.7	88.1	0.021
11754.50	-115.00	2165712.75	16978348.01	789.30	1.335	0.78969	30.6	1.551	0.021	0.00437	11.5	88.1	0.022
11754.50	-110.00	2165717.75	16978348.13	789.30	1.447	0.85759	30.7	1.682	0.023	0.00451	11.2	88.1	0.023
11754.50	-105.00	2165722.73	16978348.24	789.30	1.573	0.93435	30.7	1.829	0.024	0.00463	10.9	88.2	0.024
11754.50	-100.00	2165727.74	16978348.36	789.30	1.715	1.02153	30.8	1.996	0.025	0.00471	10.5	88.3	0.026
11754.50	-95.00	2165732.74	16978348.47	789.30	1.876	1.12100	30.9	2.186	0.027	0.00472	10.0	88.4	0.027
11754.50	-90.00	2165737.73	16978348.59	789.30	2.061	1.23507	30.9	2.402	0.028	0.00464	9.4	88.5	0.028
11754.50	-85.00	2165742.74	16978348.70	789.30	2.271	1.36660	31.0	2.651	0.029	0.00442	8.6	88.7	0.030
11754.50	-80.00	2165747.74	16978348.82	789.30	2.514	1.51907	31.1	2.937	0.030	0.00401	7.6	89.1	0.030
11754.50	-75.00	2165752.74	16978348.94	789.30	2.793	1.69686	31.3	3.268	0.031	0.00332	6.1	89.5	0.031
11754.49	-70.00	2165757.74	16978349.05	789.30	3.118	1.90536	31.4	3.654	0.031	0.00230	4.2	90.2	0.031
11754.49	-65.00	2165762.74	16978349.17	789.30	3.497	2.15132	31.6	4.106	0.031	0.00138	2.6	91.1	0.031
11754.49	-60.00	2165767.73	16978349.28	789.30	3.939	2.44307	31.8	4.635	0.029	0.00310	6.0	92.5	0.029
11754.49	-55.00	2165772.73	16978349.40	789.30	4.458	2.79085	32.0	5.260	0.026	0.00706	15.1	94.1	0.027
11754.49	-50.00	2165777.73	16978349.51	789.30	5.068	3.20700	32.3	5.997	0.021	0.01315	32.4	93.8	0.024
11754.49	-45.00	2165782.73	16978349.63	789.30	5.782	3.70582	32.7	6.868	0.013	0.02216	59.5	83.0	0.024
11754.49	-40.00	2165787.73	16978349.74	789.30	6.616	4.30269	33.0	7.892	0.011	0.03527	73.3	72.3	0.036
11754.49	-35.00	2165792.73	16978349.86	789.30	7.580	5.01168	33.5	9.087	0.027	0.05403	63.4	72.4	0.060
11754.49	-30.00	2165797.73	16978349.98	789.30	8.673	5.84028	34.0	10.456	0.054	0.08016	55.8	74.5	0.097
11754.49	-25.00	2165802.72	16978350.09	789.30	9.875	6.77992	34.5	11.978	0.091	0.11509	51.7	76.8	0.147
11754.49	-20.00	2165807.72	16978350.21	789.30	11.131	7.79219	35.0	13.587	0.135	0.15877	49.6	79.0	0.208
11754.49	-15.00	2165812.72	16978350.32	789.30	12.344	8.79550	35.5	15.157	0.183	0.20810	48.7	81.4	0.277
11754.49	-10.00	2165817.72	16978350.44	789.30	13.375	9.66525	35.9	16.502	0.228	0.25571	48.3	84.1	0.343
11754.48	-5.00	2165822.72	16978350.55	789.30	14.073	10.26113	36.1	17.417	0.261	0.29099	48.1	87.0	0.391
11754.48	0.00	2165827.72	16978350.67	789.30	14.322	10.47434	36.2	17.743	0.273	0.30417	48.1	90.0	0.409
11754.48	5.00	2165832.72	16978350.78	789.30	14.077	10.26472	36.1	17.422	0.261	0.29127	48.1	93.0	0.391
11754.48	10.00	2165837.72	16978350.90	789.30	13.383	9.67201	35.9	16.512	0.229	0.25620	48.3	95.9	0.343
11754.48	15.00	2165842.71	16978351.02	789.30	12.355	8.80450	35.5	15.171	0.184	0.20868	48.6	98.5	0.278
11754.48	20.00	2165847.71	16978351.13	789.30	11.144	7.80222	35.0	13.603	0.136	0.15934	49.6	100.9	0.209
11754.48	25.00	2165852.71	16978351.25	789.30	9.888	6.78992	34.5	11.994	0.091	0.11558	51.7	103.2	0.147
11754.48	30.00	2165857.71	16978351.36	789.30	8.685	5.84954	34.0	10.472	0.055	0.08055	55.7	105.4	0.097
11754.48	35.00	2165862.71	16978351.48	789.30	7.591	5.01989	33.5	9.101	0.027	0.05432	63.2	107.6	0.060
11754.48	40.00	2165867.71	16978351.59	789.30	6.626	4.30977	33.0	7.905	0.011	0.03548	73.3	107.7	0.036
11754.48	45.00	2165872.71	16978351.71	789.30	5.791	3.71184	32.7	6.878	0.013	0.02231	59.9	97.3	0.024
11754.48	50.00	2165877.70	16978351.82	789.30	5.075	3.21208	32.3	6.006	0.021	0.01326	32.8	86.3	0.024
11754.48	55.00	2165882.70	16978351.94	789.30	4.465	2.79513	32.0	5.267	0.026	0.00714	15.4	85.9	0.027
11754.47	60.00	2165887.70	16978352.06	789.30	3.945	2.44668	31.8	4.642	0.029	0.00315	6.2	87.5	0.029
11754.47	65.00	2165892.70	16978352.17	789.30	3.501	2.15437	31.6	4.111	0.031	0.00138	2.6	88.8	0.031
11754.47	70.00	2165897.70	16978352.29	789.30	3.122	1.90796	31.4	3.659	0.031	0.00227	4.2	89.8	0.031
11754.47	75.00	2165902.70	16978352.40	789.30	2.797	1.69908	31.3	3.273	0.031	0.00330	6.1	90.5	0.031
11754.47	80.00	2165907.70	16978352.52	789.30	2.517	1.52098	31.1	2.940	0.030	0.00399	7.5	90.9	0.030
11754.47	85.00	2165912.70	16978352.63	789.30	2.274	1.36824	31.0	2.654	0.029	0.00441	8.6	91.3	0.029
11754.47	90.00	2165917.69	16978352.75	789.30	2.063	1.23650	30.9	2.405	0.028	0.00463	9.4	91.5	0.028
11754.47	95.00	2165922.69	16978352.86	789.30	1.878	1.12224	30.9	2.188	0.027	0.00471	10.0	91.6	0.027
11754.47	100.00	2165927.69	16978352.98	789.30	1.717	1.02261	30.8	1.998	0.025	0.00470	10.5	91.7	0.026
11754.47	105.00	2165932.69	16978353.10	789.30	1.574	0.93531	30.7	1.831	0.024	0.00463	10.9	91.8	0.024
11754.47	110.00	2165937.69	16978353.21	789.30	1.448	0.85844	30.7	1.684	0.023	0.00451	11.2	91.9	0.023
11754.47	115.00	2165942.69	16978353.33	789.30	1.336	0.79044	30.6	1.553	0.022	0.00437	11.5	91.9	0.022
11754.47	120.00	2165947.69	16978353.44	789.30	1.236	0.73004	30.6	1.436	0.020	0.00421	11.7	91.9	0.021
11754.46	125.00	2165952.68	16978353.56	789.30	1.147	0.67617	30.5	1.331	0.019	0.00405	11.9	91.9	0.020
11754.46	130.00	2165957.68	16978353.67	789.30	1.067	0.62794	30.5	1.238	0.018	0.00388	12.0	91.9	0.019
11754.46	135.00	2165962.68	16978353.79	789.30	0.994	0.58460	30.5	1.154	0.017	0.00372	12.2	91.9	0.018
11754.46	140.00	2165967.68	16978353.90	789.30	0.929	0.54553	30.4	1.077	0.016	0.00356	12.3	91.8	0.017
11754.46	145.00	2165972.68	16978354.02	789.30	0.870	0.51019	30.4	1.008	0.015	0.00340	12.4	91.8	0.016
11754.46	150.00	2165977.68	16978354.14	789.30	0.816	0.47813	30.4	0.946	0.015	0.00325	12.5	91.8	0.015
11754.46	155.00	2165982.68	16978354.25	789.30	0.767	0.44895	30.3	0.889	0.014	0.00310	12.6	91.8	0.014
11754.46	160.00	2165987.68	16978354.37	789.30	0.722	0.42234	30.3	0.836	0.013	0.00296	12.6	91.7	0.014
11754.46	165.00	2165992.67	16978354.48	789.30	0.681	0.39800	30.3	0.789	0.013	0.00283	12.7	91.7	0.013
11754.46	170.00	2165997.67	16978354.60	789.30	0.643	0.37568	30.3	0.745	0.012	0.00271	12.7	91.7	0.012
11754.46	175.00	2166002.67	16978354.71	789.30	0.608	0.35517	30.3	0.704	0.011	0.00259	12.8	91.7	0.012
11754.46	180.00	2166007.67	16978354.83	789.30	0.576	0.33627	30.3	0.667	0.011	0.00248	12.8	91.6	0.011
11754.46	185.00	2166012.67	16978354.94	789.30	0.547	0.31883	30.2	0.633	0.010	0.00237	12.9	91.6	0.011
11754.45	190.00	2166017.67	16978355.06	789.30	0.519	0.30271	30.2	0.601	0.010	0.00227	12.9	91.6	0.010
11754.45	195.00	2166022.67	16978355.18	789.30	0.494	0.28776	30.2	0.572	0.009	0.00218	12.9	91.5	0.010
11754.45	200.00	2166027.66	16978355.29	789.30	0.470	0.27389	30.2	0.544	0.009	0.00209	13.0	91.5	0.009
11754.45	205.00	2166032.66	16978355.41	789.30	0.448	0.26099	30.2	0.519	0.009	0.00200	13.0	91.5	0.009
11754.45	210.00	2166037.66	16978355.52	789.30	0.428	0.24897	30.2	0.495	0.008	0.00192	13.0	91.5</	

11754.45	235.00	2166062.66	16978356.10	789.30	0.344	0.19967	30.2	0.397	0.007	0.00158	13.1	91.3	0.007
11754.45	240.00	2166067.65	16978356.22	789.30	0.330	0.19158	30.1	0.381	0.007	0.00152	13.1	91.3	0.007
11754.45	245.00	2166072.65	16978356.33	789.30	0.317	0.18396	30.1	0.366	0.006	0.00147	13.2	91.3	0.006
11754.45	250.00	2166077.65	16978356.45	789.30	0.305	0.17678	30.1	0.352	0.006	0.00142	13.2	91.3	0.006
11754.44	255.00	2166082.65	16978356.56	789.30	0.293	0.17002	30.1	0.339	0.006	0.00137	13.2	91.2	0.006
11754.44	260.00	2166087.65	16978356.68	789.30	0.282	0.16363	30.1	0.326	0.006	0.00132	13.2	91.2	0.006
11754.44	265.00	2166092.65	16978356.79	789.30	0.272	0.15760	30.1	0.314	0.005	0.00128	13.2	91.2	0.006
11754.44	270.00	2166097.65	16978356.91	789.30	0.262	0.15189	30.1	0.303	0.005	0.00123	13.2	91.2	0.005
11754.44	275.00	2166102.64	16978357.02	789.30	0.253	0.14649	30.1	0.292	0.005	0.00119	13.2	91.2	0.005
11754.44	280.00	2166107.64	16978357.14	789.30	0.244	0.14137	30.1	0.282	0.005	0.00115	13.2	91.2	0.005
11754.44	285.00	2166112.64	16978357.26	789.30	0.235	0.13651	30.1	0.272	0.005	0.00112	13.3	91.1	0.005
11754.44	290.00	2166117.64	16978357.37	789.30	0.228	0.13189	30.1	0.263	0.005	0.00108	13.3	91.1	0.005
11754.44	295.00	2166122.64	16978357.49	789.30	0.220	0.12751	30.1	0.254	0.004	0.00105	13.3	91.1	0.005
11754.44	300.00	2166127.64	16978357.60	789.30	0.213	0.12334	30.1	0.246	0.004	0.00102	13.3	91.1	0.004

PLS-CADD Version 15.00x64 4:07:53 PM Monday, December 17, 2018
 Sargent & Lundy
 Project Name: 'g:\xcel\w3603_str199(w3601)-byf_tp\w3606_str199(w3601)-byf_tp.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

***** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly *****

***** User may prefer to add other specific load cases utilizing alternative Strength Factors *****

***** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER *****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
 Cross section offset for graph +/-: 300.00 (ft)
 Result interval for graph: 5.00 (ft)
 Electric field limit: 0.00 (kV/m)
 Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure WXXXX-Tap to structure WXXXX-Tap 2

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
6	1	1	34.5	141.000	0	0.858
6	2	1	34.5	141.000	120	0.858
6	3	1	34.5	141.000	-120	0.858

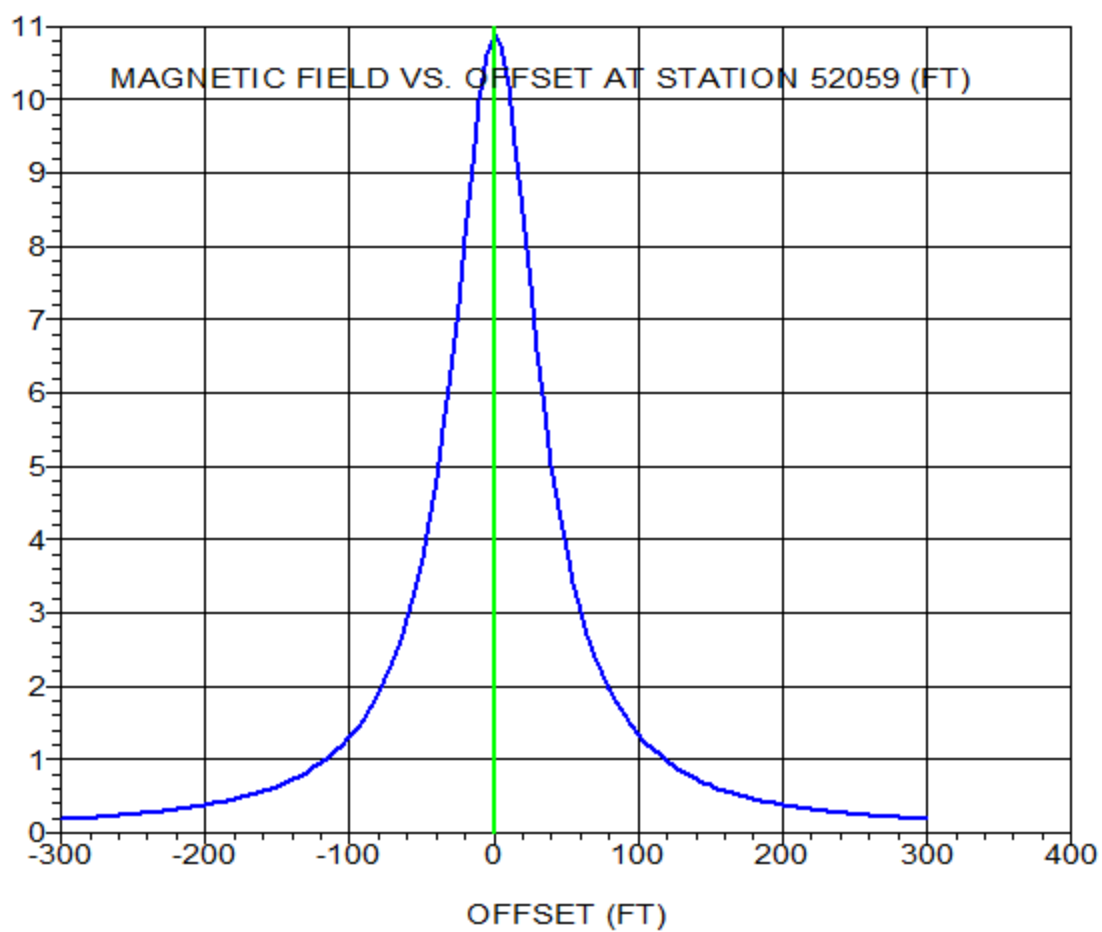
Calculated EMF Circuit Data For Last Point:

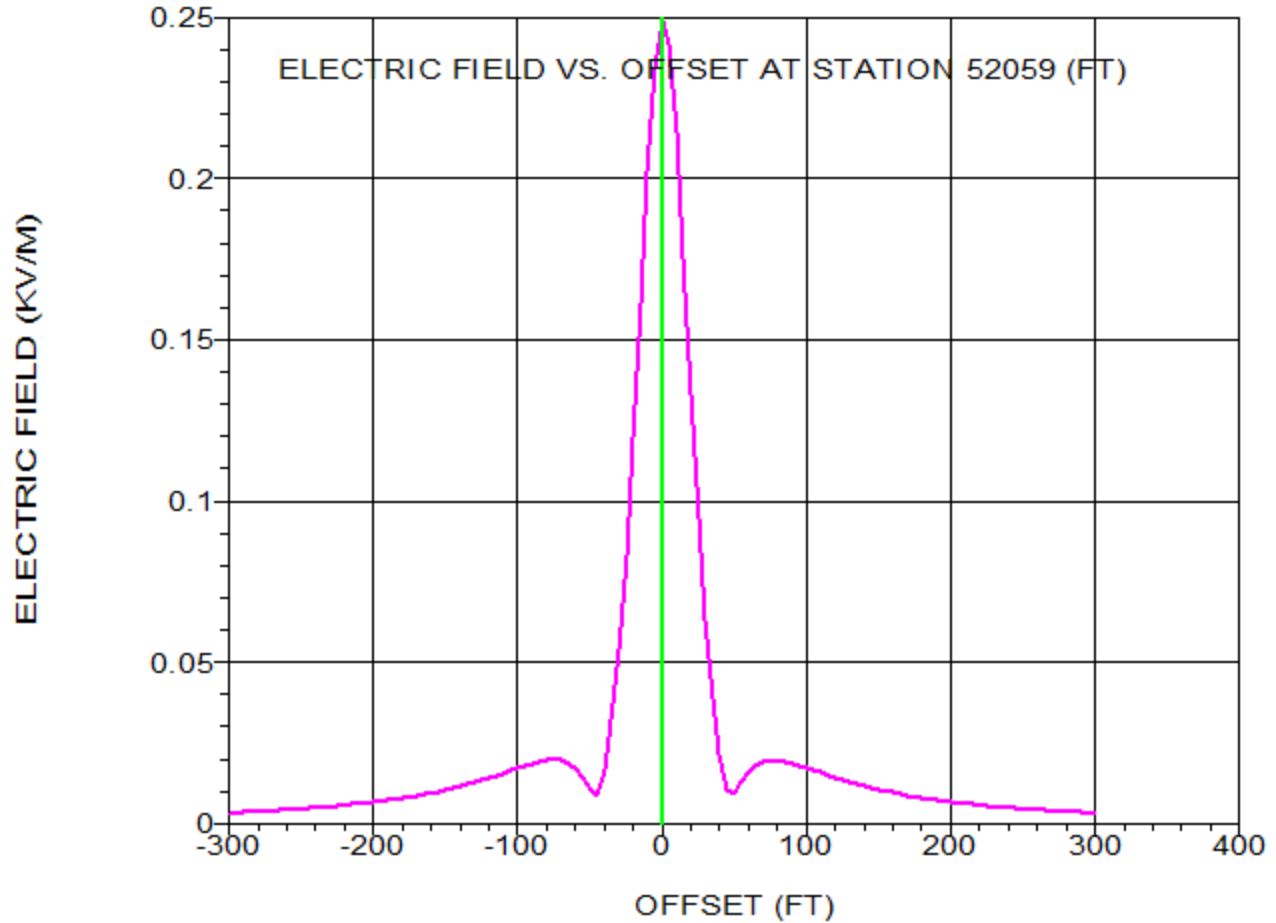
Wire station and offset are based on alignment closest to point on wire.
 In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Wire Voltage To Gnd. (kV)	
6	1	212° F	Max Sag	RS	Left	2174376.08	17012236.48	887.49	52059.07	0.74	0.858	19.92
6	2	212° F	Max Sag	RS	Left	2174376.13	17012236.48	878.01	52059.07	0.78	0.858	19.92
6	3	212° F	Max Sag	RS	Left	2174376.16	17012236.47	868.53	52059.07	0.82	0.858	19.92

Maximum magnetic field of 10.89 (mG) found at station 52059.09, offset 0.00 (ft)
 Maximum electric field of 0.249 (kV/m) found at station 52059.09, offset 0.00 (ft)

MAGNETIC FIELD (MG)





EMF Calculation Results:

Station	Offset	X	Y	Z	B	B	B	Phase	B	E	E	E	E	E
Res.	(ft)	(ft)	(ft)	(ft)	Real	Img.	Angle	(deg)	(mG)	(kV/m)	(kV/m)	(deg)	Axis	rms
(deg)	(kV/m)				(mG)	(mG)							Angle	

-														
52059.09	-300.00	2174075.43	17012228.98	836.32	0.152	0.08847	30.2	0.176	0.003	0.00100	18.4	88.9	0.003	
52059.09	-295.00	2174080.43	17012229.11	836.32	0.157	0.09127	30.2	0.182	0.003	0.00103	18.4	88.9	0.003	
52059.09	-290.00	2174085.43	17012229.23	836.32	0.162	0.09422	30.2	0.187	0.003	0.00107	18.4	88.9	0.003	
52059.09	-285.00	2174090.43	17012229.36	836.32	0.167	0.09731	30.2	0.194	0.003	0.00110	18.4	88.9	0.003	
52059.09	-280.00	2174095.43	17012229.48	836.32	0.173	0.10057	30.2	0.200	0.003	0.00114	18.4	88.9	0.004	
52059.09	-275.00	2174100.43	17012229.61	836.32	0.179	0.10400	30.2	0.207	0.004	0.00118	18.4	88.8	0.004	
52059.09	-270.00	2174105.42	17012229.73	836.32	0.185	0.10762	30.2	0.214	0.004	0.00122	18.4	88.8	0.004	
52059.09	-265.00	2174110.42	17012229.86	836.32	0.191	0.11144	30.2	0.221	0.004	0.00126	18.4	88.8	0.004	
52059.09	-260.00	2174115.42	17012229.98	836.32	0.198	0.11548	30.2	0.229	0.004	0.00130	18.4	88.8	0.004	
52059.09	-255.00	2174120.42	17012230.11	836.32	0.206	0.11975	30.2	0.238	0.004	0.00135	18.4	88.8	0.004	
52059.09	-250.00	2174125.42	17012230.23	836.32	0.213	0.12427	30.2	0.247	0.004	0.00140	18.4	88.8	0.004	
52059.09	-245.00	2174130.42	17012230.36	836.32	0.221	0.12906	30.2	0.256	0.004	0.00145	18.4	88.7	0.005	
52059.09	-240.00	2174135.41	17012230.48	836.32	0.230	0.13414	30.2	0.266	0.005	0.00151	18.4	88.7	0.005	
52059.09	-235.00	2174140.41	17012230.61	836.32	0.239	0.13955	30.3	0.277	0.005	0.00157	18.4	88.7	0.005	
52059.09	-230.00	2174145.41	17012230.73	836.32	0.249	0.14529	30.3	0.288	0.005	0.00163	18.4	88.7	0.005	
52059.09	-225.00	2174150.41	17012230.86	836.32	0.259	0.15141	30.3	0.300	0.005	0.00169	18.4	88.6	0.005	
52059.09	-220.00	2174155.41	17012230.98	836.32	0.270	0.15793	30.3	0.313	0.005	0.00176	18.4	88.6	0.006	
52059.09	-215.00	2174160.41	17012231.10	836.32	0.282	0.16490	30.3	0.327	0.006	0.00183	18.4	88.6	0.006	
52059.09	-210.00	2174165.41	17012231.23	836.32	0.295	0.17235	30.3	0.342	0.006	0.00191	18.4	88.6	0.006	
52059.09	-205.00	2174170.40	17012231.35	836.32	0.308	0.18034	30.3	0.357	0.006	0.00199	18.4	88.6	0.006	
52059.09	-200.00	2174175.40	17012231.48	836.32	0.323	0.18890	30.3	0.374	0.006	0.00208	18.4	88.5	0.007	
52059.09	-195.00	2174180.40	17012231.60	836.32	0.338	0.19810	30.3	0.392	0.007	0.00217	18.4	88.5	0.007	
52059.09	-190.00	2174185.40	17012231.73	836.32	0.355	0.20800	30.4	0.411	0.007	0.00226	18.4	88.5	0.007	
52059.09	-185.00	2174190.40	17012231.85	836.32	0.373	0.21867	30.4	0.432	0.007	0.00237	18.4	88.5	0.008	
52059.09	-180.00	2174195.40	17012231.98	836.32	0.392	0.23020	30.4	0.455	0.007	0.00248	18.4	88.4	0.008	
52059.09	-175.00	2174200.39	17012232.10	836.32	0.413	0.24268	30.4	0.479	0.008	0.00259	18.4	88.4	0.008	

52059.09	-170.00	2174205.39	17012232.23	836.32	0.436	0.25621	30.4	0.506	0.008	0.00272	18.4	88.4	0.009
52059.09	-165.00	2174210.39	17012232.35	836.32	0.461	0.27092	30.5	0.534	0.009	0.00285	18.4	88.4	0.009
52059.09	-160.00	2174215.39	17012232.48	836.32	0.487	0.28693	30.5	0.565	0.009	0.00299	18.4	88.3	0.009
52059.09	-155.00	2174220.39	17012232.60	836.32	0.516	0.30442	30.5	0.599	0.009	0.00314	18.4	88.3	0.010
52059.09	-150.00	2174225.39	17012232.73	836.32	0.548	0.32357	30.6	0.637	0.010	0.00329	18.3	88.3	0.010
52059.09	-145.00	2174230.39	17012232.85	836.32	0.583	0.34457	30.6	0.677	0.010	0.00346	18.3	88.3	0.011
52059.09	-140.00	2174235.38	17012232.98	836.32	0.621	0.36769	30.6	0.722	0.011	0.00364	18.3	88.3	0.012
52059.09	-135.00	2174240.38	17012233.10	836.32	0.663	0.39320	30.7	0.771	0.012	0.00382	18.3	88.2	0.012
52059.09	-130.00	2174245.38	17012233.23	836.32	0.710	0.42144	30.7	0.825	0.012	0.00402	18.3	88.2	0.013
52059.09	-125.00	2174250.38	17012233.35	836.32	0.761	0.45281	30.8	0.885	0.013	0.00422	18.2	88.2	0.013
52059.09	-120.00	2174255.38	17012233.48	836.32	0.818	0.48776	30.8	0.952	0.013	0.00443	18.2	88.3	0.014
52059.09	-115.00	2174260.38	17012233.60	836.32	0.881	0.52685	30.9	1.027	0.014	0.00464	18.1	88.3	0.015
52059.09	-110.00	2174265.37	17012233.72	836.32	0.952	0.57074	30.9	1.110	0.015	0.00486	18.1	88.3	0.016
52059.09	-105.00	2174270.37	17012233.85	836.32	1.031	0.62020	31.0	1.203	0.016	0.00507	18.0	88.4	0.016
52059.09	-100.00	2174275.37	17012233.97	836.32	1.120	0.67620	31.1	1.308	0.016	0.00527	17.8	88.5	0.017
52059.09	-95.00	2174280.37	17012234.10	836.32	1.221	0.73987	31.2	1.428	0.017	0.00544	17.7	88.6	0.018
52059.09	-90.00	2174285.37	17012234.22	836.32	1.330	0.81262	31.3	1.563	0.018	0.00557	17.4	88.8	0.019
52059.09	-85.00	2174290.37	17012234.35	836.32	1.465	0.89613	31.5	1.717	0.018	0.00563	17.1	89.1	0.019
52059.09	-80.00	2174295.36	17012234.47	836.32	1.613	0.99249	31.6	1.894	0.019	0.00559	16.6	89.5	0.020
52059.09	-75.00	2174300.36	17012234.60	836.32	1.783	1.10428	31.8	2.097	0.019	0.00538	15.8	90.1	0.020
52059.09	-70.00	2174305.36	17012234.72	836.32	1.978	1.23464	32.0	2.332	0.019	0.00495	14.7	91.0	0.019
52059.09	-65.00	2174310.36	17012234.85	836.32	2.204	1.38750	32.2	2.604	0.018	0.00417	12.9	92.3	0.019
52059.09	-60.00	2174315.36	17012234.97	836.32	2.465	1.56764	32.5	2.921	0.017	0.00297	10.1	94.5	0.017
52059.09	-55.00	2174320.36	17012235.10	836.32	2.769	1.78093	32.8	3.292	0.014	0.00173	6.9	98.2	0.014
52059.09	-50.00	2174325.36	17012235.22	836.32	3.121	2.03442	33.1	3.725	0.011	0.00348	18.2	103.8	0.011
52059.09	-45.00	2174330.35	17012235.35	836.32	3.530	2.33632	33.5	4.233	0.006	0.00817	53.6	78.4	0.008
52059.09	-40.00	2174335.35	17012235.47	836.32	4.003	2.69573	34.0	4.826	0.008	0.01537	62.6	64.0	0.017
52059.09	-35.00	2174340.35	17012235.60	836.32	4.545	3.12159	34.5	5.514	0.019	0.02582	53.2	69.7	0.032
52059.09	-30.00	2174345.35	17012235.72	836.32	5.159	3.62046	35.1	6.303	0.036	0.04051	48.5	73.6	0.054
52059.09	-25.00	2174350.35	17012235.85	836.32	5.837	4.19208	35.7	7.186	0.057	0.06037	46.5	76.3	0.083
52059.09	-20.00	2174355.35	17012235.97	836.32	6.556	4.82197	36.3	8.138	0.083	0.08573	45.8	78.7	0.120
52059.09	-15.00	2174360.34	17012236.09	836.32	7.272	5.47139	37.0	9.100	0.112	0.11537	45.8	81.0	0.161
52059.09	-10.00	2174365.34	17012236.22	836.32	7.910	6.06915	37.5	9.970	0.140	0.14555	46.1	83.5	0.202
52059.09	-5.00	2174370.34	17012236.34	836.32	8.377	6.51594	37.9	10.612	0.162	0.16980	46.4	86.4	0.235
52059.09	0.00	2174375.34	17012236.47	836.32	8.579	6.71318	38.0	10.894	0.172	0.18103	46.5	89.5	0.249
52059.09	5.00	2174380.34	17012236.59	836.32	8.472	6.61006	38.0	10.746	0.167	0.17534	46.5	92.6	0.242
52059.09	10.00	2174385.34	17012236.72	836.32	8.080	6.23356	37.6	10.205	0.148	0.15478	46.2	95.6	0.214
52059.09	15.00	2174390.34	17012236.84	836.32	7.485	5.67212	37.2	9.391	0.122	0.12583	45.9	98.2	0.175
52059.09	20.00	2174395.33	17012236.97	836.32	6.783	5.02934	36.6	8.444	0.093	0.09551	45.7	100.5	0.133
52059.09	25.00	2174400.33	17012237.09	836.32	6.058	4.38701	35.9	7.480	0.066	0.06852	46.1	102.8	0.095
52059.09	30.00	2174405.33	17012237.22	836.32	5.363	3.79377	35.3	6.569	0.043	0.04683	47.6	105.3	0.063
52059.09	35.00	2174410.33	17012237.34	836.32	4.727	3.27076	34.7	5.749	0.025	0.03050	51.1	108.6	0.039
52059.09	40.00	2174415.33	17012237.47	836.32	4.162	2.82181	34.1	5.028	0.011	0.01873	58.7	113.5	0.022
52059.09	45.00	2174420.33	17012237.59	836.32	3.667	2.44193	33.7	4.406	0.005	0.01053	63.9	116.0	0.011
52059.09	50.00	2174425.32	17012237.72	836.32	3.239	2.12258	33.2	3.872	0.009	0.00501	30.0	76.2	0.009
52059.09	55.00	2174430.32	17012237.84	836.32	2.869	1.85454	32.9	3.417	0.013	0.00190	8.4	79.8	0.013
52059.09	60.00	2174435.32	17012237.97	836.32	2.552	1.62925	32.6	3.027	0.016	0.00232	8.4	84.3	0.016
52059.09	65.00	2174440.32	17012238.09	836.32	2.278	1.43924	32.3	2.694	0.017	0.00364	11.8	87.0	0.018
52059.09	70.00	2174445.32	17012238.22	836.32	2.042	1.27830	32.1	2.409	0.018	0.00456	14.0	88.6	0.019
52059.09	75.00	2174450.32	17012238.34	836.32	1.837	1.14128	31.8	2.163	0.019	0.00512	15.3	89.6	0.019
52059.09	80.00	2174455.32	17012238.47	836.32	1.660	1.02401	31.7	1.950	0.019	0.00540	16.2	90.3	0.019
52059.09	85.00	2174460.31	17012238.59	836.32	1.506	0.92310	31.5	1.766	0.018	0.00551	16.8	90.7	0.019
52059.09	90.00	2174465.31	17012238.71	836.32	1.370	0.83581	31.4	1.605	0.018	0.00549	17.2	91.1	0.019
52059.09	95.00	2174470.31	17012238.84	836.32	1.252	0.75991	31.3	1.464	0.017	0.00539	17.5	91.3	0.018
52059.09	100.00	2174475.31	17012238.96	836.32	1.147	0.69358	31.2	1.341	0.016	0.00524	17.7	91.4	0.017
52059.09	105.00	2174480.31	17012239.09	836.32	1.055	0.63534	31.1	1.231	0.016	0.00505	17.8	91.6	0.016
52059.09	110.00	2174485.31	17012239.21	836.32	0.973	0.58397	31.0	1.135	0.015	0.00485	17.9	91.6	0.016
52059.09	115.00	2174490.30	17012239.34	836.32	0.900	0.53847	30.9	1.048	0.014	0.00464	18.0	91.7	0.015
52059.09	120.00	2174495.30	17012239.46	836.32	0.834	0.49799	30.8	0.971	0.014	0.00443	18.1	91.7	0.014
52059.09	125.00	2174500.30	17012239.59	836.32	0.775	0.46185	30.8	0.903	0.013	0.00422	18.1	91.7	0.014
52059.09	130.00	2174505.30	17012239.71	836.32	0.723	0.42946	30.7	0.841	0.012	0.00402	18.2	91.7	0.013
52059.09	135.00	2174510.30	17012239.84	836.32	0.675	0.40033	30.7	0.785	0.012	0.00383	18.2	91.7	0.012
52059.09	140.00	2174515.30	17012239.96	836.32	0.632	0.37404	30.6	0.734	0.011	0.00364	18.2	91.7	0.012
52059.09	145.00	2174520.29	17012240.09	836.32	0.592	0.35025	30.6	0.688	0.011	0.00347	18.2	91.7	0.011
52059.09	150.00	2174525.29	17012240.21	836.32	0.557	0.32865	30.6	0.646	0.010	0.00330	18.3	91.7	0.011
52059.09	155.00	2174530.29	17012240.34	836.32	0.524	0.30899	30.5	0.608	0.010	0.00314	18.3	91.7	0.010
52059.09	160.00	2174535.29	17012240.46	836.32	0.494	0.29104	30.5	0.574	0.009	0.00299	18.3	91.7	0.010
52059.09	165.00	2174540.29	17012240.59	836.32	0.467	0.27462	30.5	0.542	0.009	0.00285	18.3	91.6	0.009
52059.09	170.00	2174545.29	17012240.71	836.32	0.442	0.25955	30.4	0.512	0.008	0.00272	18.3	91.6	0.009
52059.09	175.00	2174550.29	17012240.84	836.32	0.419	0.24570	30.4	0.485	0.008	0.00260	18.3	91.6	0.008
52059.09	180.00	2174555.28	17012240.96	836.32	0.397	0.23294	30.4	0.460	0.007	0.00248	18.3	91.6	0.008
52059.09	185.00	2174560.28	17012241.08	836.32	0.377	0.22116	30.4	0.437	0.007	0.00237	18.3	91.5	0.008
52059.09	190.00	2174565.28	17012241.21	836.32	0.359	0.21026	30.4	0.416	0.007	0.00226	18.3	91.5	0.007
52059.09	195.00	2174570.28	17012241.33	836.32	0.342	0.20016	30.3	0.396	0.007	0.00217	18.3	91.5	0.007
52059.09	200.00	2174575.28	17012241.46	836.32	0.326	0.19078	30.3	0.378	0.006	0.00207	18.3	91.5	0.007
52059.09	205.00	2174580.28	17012241.58	836.32	0.311	0.18206	30.3	0.361	0.006	0.00199	18.3	91.4	0.006
52059.09	210.00	2174585.27	17012241.71	836.32	0.298	0.17394	30.3	0.345	0.006	0.00191	18.3	91.4	0.00

52059.09	235.00	2174610.27	17012242.33	836.32	0.241	0.14059	30.2	0.279	0.005	0.00156	18.3	91.3	0.005
52059.09	240.00	2174615.27	17012242.46	836.32	0.232	0.13511	30.2	0.268	0.005	0.00150	18.3	91.3	0.005
52059.09	245.00	2174620.26	17012242.58	836.32	0.223	0.12995	30.2	0.258	0.004	0.00145	18.3	91.3	0.005
52059.09	250.00	2174625.26	17012242.71	836.32	0.215	0.12510	30.2	0.249	0.004	0.00140	18.3	91.3	0.004
52059.09	255.00	2174630.26	17012242.83	836.32	0.207	0.12052	30.2	0.240	0.004	0.00135	18.3	91.2	0.004
52059.09	260.00	2174635.26	17012242.96	836.32	0.200	0.11620	30.2	0.231	0.004	0.00130	18.3	91.2	0.004
52059.09	265.00	2174640.26	17012243.08	836.32	0.193	0.11211	30.2	0.223	0.004	0.00125	18.3	91.2	0.004
52059.09	270.00	2174645.26	17012243.21	836.32	0.186	0.10825	30.2	0.215	0.004	0.00121	18.3	91.2	0.004
52059.09	275.00	2174650.25	17012243.33	836.32	0.180	0.10459	30.2	0.208	0.004	0.00117	18.3	91.2	0.004
52059.09	280.00	2174655.25	17012243.46	836.32	0.174	0.10112	30.2	0.201	0.003	0.00113	18.3	91.1	0.004
52059.09	285.00	2174660.25	17012243.58	836.32	0.168	0.09783	30.2	0.195	0.003	0.00109	18.3	91.1	0.003
52059.09	290.00	2174665.25	17012243.70	836.32	0.163	0.09471	30.2	0.189	0.003	0.00106	18.2	91.1	0.003
52059.09	295.00	2174670.25	17012243.83	836.32	0.158	0.09174	30.1	0.183	0.003	0.00103	18.2	91.1	0.003
52059.09	300.00	2174675.25	17012243.95	836.32	0.153	0.08891	30.1	0.177	0.003	0.00099	18.2	91.1	0.003

PLS-CADD Version 15.00x64 4:07:00 PM Monday, December 17, 2018
 Sargent & Lundy
 Project Name: 'g:\xcel\w3603_str199(w3601)-byf_tp\w3606_str199(w3601)-byf_tp.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

***** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly *****

***** User may prefer to add other specific load cases utilizing alternative Strength Factors *****

***** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER *****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
 Cross section offset for graph +/-: 300.00 (ft)
 Result interval for graph: 5.00 (ft)
 Electric field limit: 0.00 (kV/m)
 Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure W3603-175 to structure W3603-176

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
5	1	1	34.5	141.000	0	0.858
5	2	1	34.5	141.000	120	0.858
5	3	1	34.5	141.000	-120	0.858

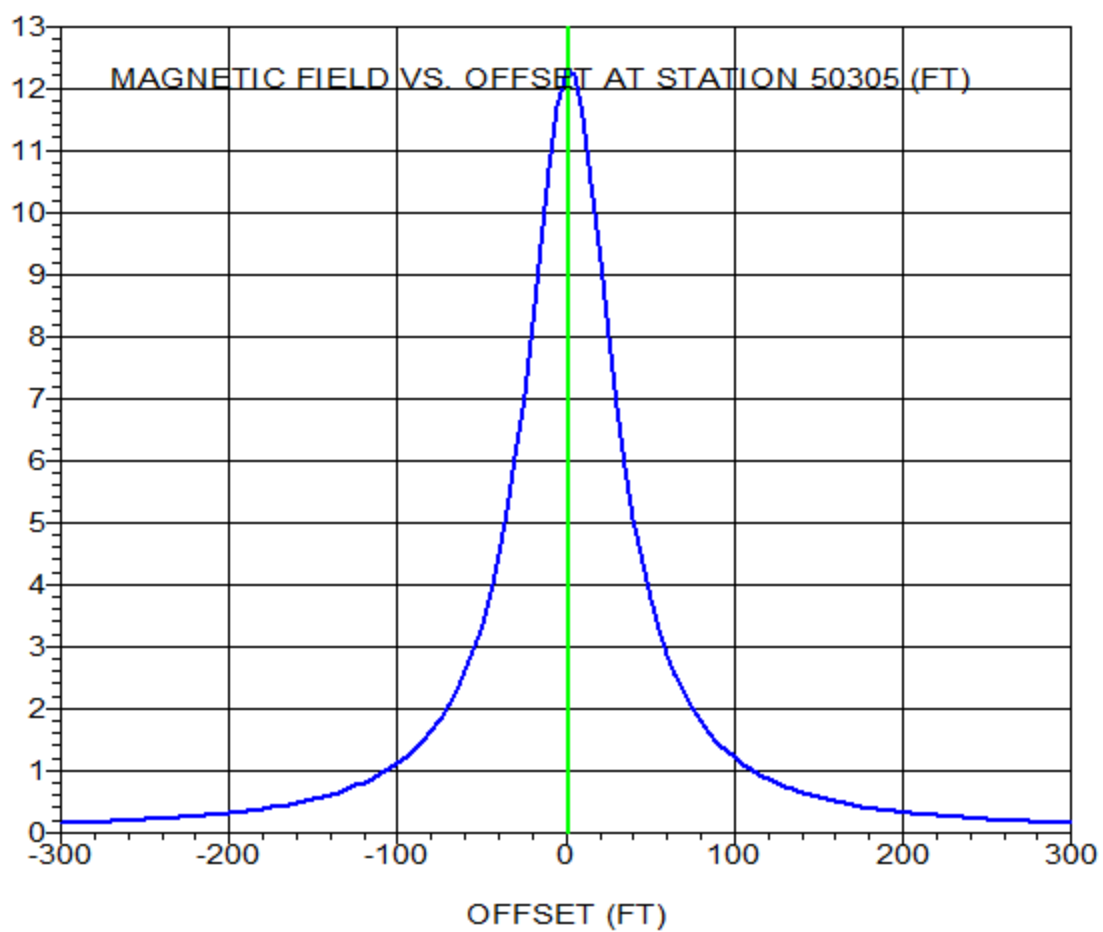
Calculated EMF Circuit Data For Last Point:

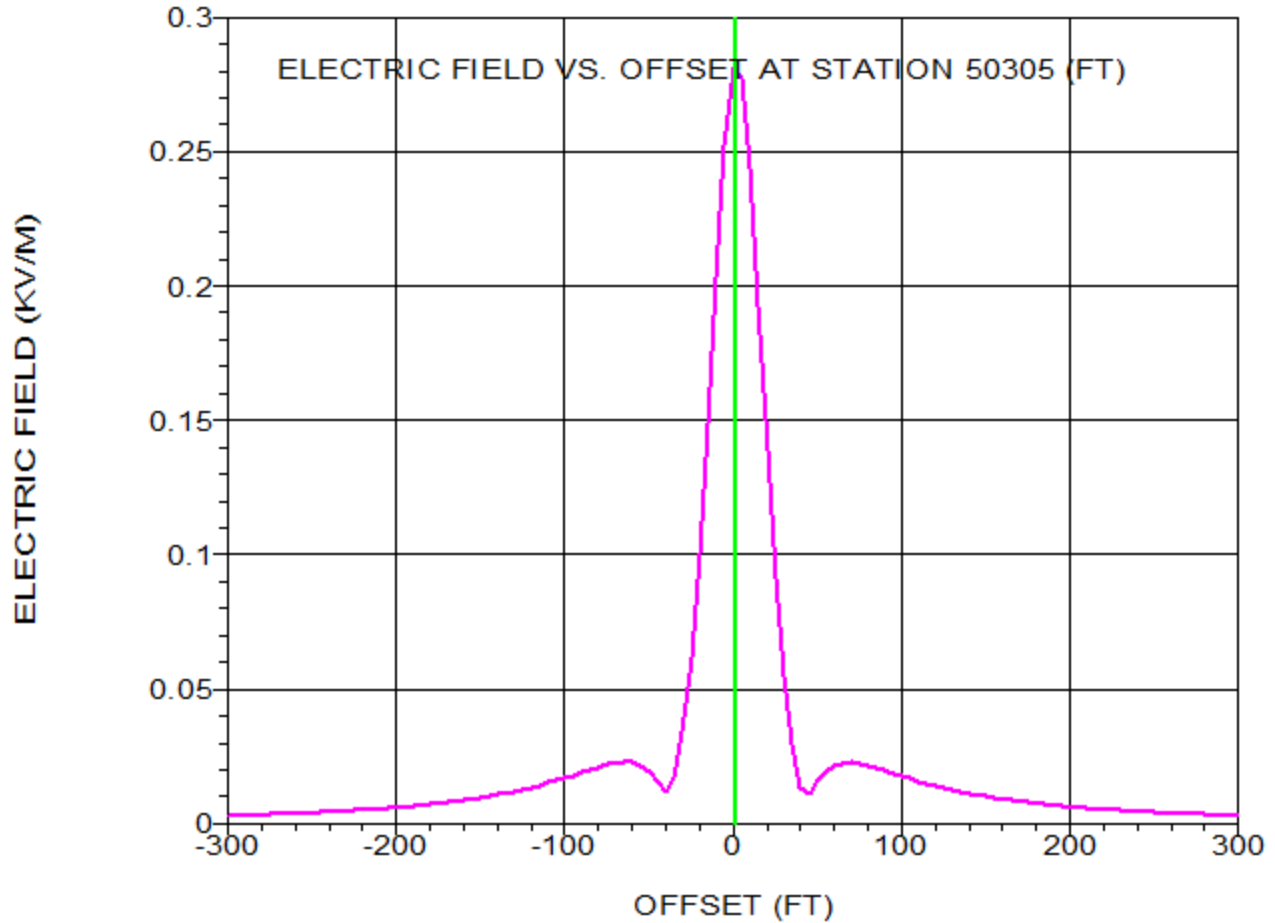
Wire station and offset are based on alignment closest to point on wire.
 In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Wire Voltage To Gnd. (kV)
5	1	212° F	Max Sag	RS	Left	2175060.22	17012577.96	929.47	50304.56	2.04	19.92
5	2	212° F	Max Sag	RS	Left	2175060.28	17012577.88	921.25	50304.56	2.14	19.92
5	3	212° F	Max Sag	RS	Left	2175060.22	17012577.96	913.33	50304.56	2.04	19.92

Maximum magnetic field of 12.27 (mG) found at station 50304.52, offset 0.00 (ft)
 Maximum electric field of 0.281 (kV/m) found at station 50304.52, offset 0.00 (ft)

MAGNETIC FIELD (MG)





EMF Calculation Results:

Station	Offset	X	Y	Z	B	B	B	Phase	B rms	E	E	E	Phase	E Axis	E rms
Res.	(ft)	(ft)	(ft)	(ft)	Real	Img.	Angle	(deg)	(mG)	(kV/m)	(kV/m)	(deg)	(deg)	(deg)	(deg)
(deg)	(kV/m)				(mG)	(mG)	(deg)		(mG)	(kV/m)	(kV/m)	(deg)			

-															
50304.52	-300.00	2174877.09	17012818.16	884.90	0.127	0.07113	29.2	0.146	0.003	0.00084	17.4	88.9	0.003		
50304.52	-295.00	2174880.12	17012814.18	884.90	0.132	0.07345	29.2	0.151	0.003	0.00087	17.4	88.9	0.003		
50304.52	-290.00	2174883.16	17012810.20	884.90	0.136	0.07589	29.2	0.156	0.003	0.00090	17.3	88.9	0.003		
50304.52	-285.00	2174886.19	17012806.23	884.90	0.140	0.07845	29.2	0.161	0.003	0.00093	17.3	88.9	0.003		
50304.52	-280.00	2174889.22	17012802.25	884.90	0.145	0.08115	29.2	0.166	0.003	0.00096	17.3	88.8	0.003		
50304.52	-275.00	2174892.25	17012798.27	884.90	0.150	0.08400	29.2	0.172	0.003	0.00099	17.3	88.8	0.003		
50304.52	-270.00	2174895.28	17012794.30	884.90	0.155	0.08700	29.2	0.178	0.003	0.00103	17.3	88.8	0.003		
50304.52	-265.00	2174898.31	17012790.32	884.90	0.161	0.09017	29.3	0.185	0.003	0.00106	17.3	88.8	0.004		
50304.52	-260.00	2174901.34	17012786.34	884.90	0.167	0.09352	29.3	0.191	0.004	0.00110	17.3	88.8	0.004		
50304.52	-255.00	2174904.37	17012782.37	884.90	0.173	0.09706	29.3	0.198	0.004	0.00114	17.3	88.8	0.004		
50304.52	-250.00	2174907.40	17012778.39	884.90	0.180	0.10081	29.3	0.206	0.004	0.00118	17.3	88.7	0.004		
50304.52	-245.00	2174910.43	17012774.41	884.90	0.187	0.10479	29.3	0.214	0.004	0.00123	17.3	88.7	0.004		
50304.52	-240.00	2174913.47	17012770.44	884.90	0.194	0.10901	29.3	0.223	0.004	0.00127	17.3	88.7	0.004		
50304.52	-235.00	2174916.50	17012766.46	884.90	0.202	0.11349	29.3	0.232	0.004	0.00132	17.3	88.7	0.004		
50304.52	-230.00	2174919.53	17012762.48	884.90	0.210	0.11826	29.4	0.241	0.004	0.00138	17.3	88.6	0.005		
50304.52	-225.00	2174922.56	17012758.51	884.90	0.219	0.12334	29.4	0.251	0.005	0.00143	17.3	88.6	0.005		
50304.52	-220.00	2174925.59	17012754.53	884.90	0.229	0.12876	29.4	0.262	0.005	0.00149	17.3	88.6	0.005		
50304.52	-215.00	2174928.62	17012750.55	884.90	0.239	0.13455	29.4	0.274	0.005	0.00155	17.3	88.6	0.005		
50304.52	-210.00	2174931.65	17012746.58	884.90	0.250	0.14075	29.4	0.287	0.005	0.00162	17.3	88.5	0.005		
50304.52	-205.00	2174934.68	17012742.60	884.90	0.261	0.14738	29.4	0.300	0.005	0.00169	17.3	88.5	0.006		
50304.52	-200.00	2174937.71	17012738.62	884.90	0.274	0.15450	29.5	0.314	0.006	0.00176	17.3	88.5	0.006		
50304.52	-195.00	2174940.74	17012734.65	884.90	0.287	0.16215	29.5	0.330	0.006	0.00184	17.3	88.5	0.006		
50304.52	-190.00	2174943.77	17012730.67	884.90	0.301	0.17039	29.5	0.346	0.006	0.00193	17.3	88.4	0.006		
50304.52	-185.00	2174946.81	17012726.69	884.90	0.317	0.17928	29.5	0.364	0.006	0.00202	17.3	88.4	0.007		
50304.52	-180.00	2174949.84	17012722.72	884.90	0.333	0.18888	29.5	0.383	0.007	0.00212	17.3	88.4	0.007		
50304.52	-175.00	2174952.87	17012718.74	884.90	0.351	0.19928	29.6	0.404	0.007	0.00222	17.2	88.3	0.007		

50304.52	-170.00	2174955.90	17012714.76	884.90	0.371	0.21056	29.6	0.427	0.008	0.00233	17.2	88.3	0.008
50304.52	-165.00	2174958.93	17012710.79	884.90	0.392	0.22283	29.6	0.451	0.008	0.00245	17.2	88.3	0.008
50304.52	-160.00	2174961.96	17012706.81	884.90	0.415	0.23620	29.6	0.478	0.008	0.00257	17.2	88.2	0.009
50304.52	-155.00	2174964.99	17012702.83	884.90	0.440	0.25080	29.7	0.507	0.009	0.00271	17.2	88.2	0.009
50304.52	-150.00	2174968.02	17012698.86	884.90	0.468	0.26680	29.7	0.539	0.009	0.00285	17.2	88.2	0.010
50304.52	-145.00	2174971.05	17012694.88	884.90	0.498	0.28438	29.7	0.574	0.010	0.00301	17.2	88.1	0.010
50304.52	-140.00	2174974.08	17012690.90	884.90	0.531	0.30374	29.8	0.612	0.010	0.00317	17.1	88.1	0.011
50304.52	-135.00	2174977.12	17012686.93	884.90	0.568	0.32513	29.8	0.654	0.011	0.00335	17.1	88.1	0.011
50304.52	-130.00	2174980.15	17012682.95	884.90	0.608	0.34884	29.8	0.701	0.012	0.00353	17.1	88.0	0.012
50304.52	-125.00	2174983.18	17012678.97	884.90	0.653	0.37520	29.9	0.753	0.012	0.00373	17.0	88.0	0.013
50304.52	-120.00	2174986.21	17012675.00	884.90	0.703	0.40464	29.9	0.811	0.013	0.00395	17.0	88.0	0.014
50304.52	-115.00	2174989.24	17012671.02	884.90	0.759	0.43762	30.0	0.876	0.014	0.00417	16.9	88.0	0.014
50304.52	-110.00	2174992.27	17012667.05	884.90	0.821	0.47472	30.0	0.949	0.015	0.00440	16.9	88.0	0.015
50304.52	-105.00	2174995.30	17012663.07	884.90	0.892	0.51666	30.1	1.030	0.015	0.00465	16.8	88.0	0.016
50304.52	-100.00	2174998.33	17012659.09	884.90	0.971	0.56426	30.2	1.123	0.016	0.00489	16.7	88.0	0.017
50304.52	-95.00	2175001.36	17012655.12	884.90	1.061	0.61858	30.2	1.228	0.017	0.00514	16.5	88.1	0.018
50304.52	-90.00	2175004.39	17012651.14	884.90	1.164	0.68087	30.3	1.348	0.018	0.00537	16.3	88.2	0.019
50304.52	-85.00	2175007.43	17012647.16	884.90	1.281	0.75273	30.4	1.486	0.019	0.00557	16.1	88.3	0.020
50304.52	-80.00	2175010.46	17012643.19	884.90	1.416	0.83610	30.6	1.645	0.020	0.00573	15.8	88.5	0.021
50304.52	-75.00	2175013.49	17012639.21	884.90	1.573	0.93345	30.7	1.829	0.021	0.00579	15.3	88.8	0.022
50304.52	-70.00	2175016.52	17012635.23	884.90	1.754	1.04787	30.9	2.043	0.022	0.00572	14.7	89.2	0.023
50304.52	-65.00	2175019.55	17012631.26	884.90	1.967	1.18329	31.0	2.295	0.022	0.00543	13.7	89.9	0.023
50304.52	-60.00	2175022.58	17012627.28	884.90	2.216	1.34472	31.3	2.592	0.022	0.00481	12.2	91.0	0.023
50304.52	-55.00	2175025.61	17012623.30	884.90	2.510	1.53851	31.5	2.944	0.021	0.00372	9.9	92.7	0.022
50304.52	-50.00	2175028.64	17012619.33	884.90	2.859	1.77277	31.8	3.364	0.019	0.00223	6.6	95.5	0.019
50304.52	-45.00	2175031.67	17012615.35	884.90	3.273	2.05768	32.2	3.866	0.016	0.00306	11.0	100.2	0.016
50304.52	-40.00	2175034.70	17012611.37	884.90	3.765	2.40578	32.6	4.468	0.010	0.00800	37.7	100.0	0.012
50304.52	-35.00	2175037.73	17012607.40	884.90	4.349	2.83180	33.1	5.190	0.007	0.01625	65.3	62.3	0.017
50304.52	-30.00	2175040.77	17012603.42	884.90	5.036	3.35141	33.6	6.049	0.019	0.02888	56.6	66.8	0.034
50304.52	-25.00	2175043.80	17012599.44	884.90	5.831	3.97749	34.3	7.058	0.040	0.04750	50.0	71.5	0.062
50304.52	-20.00	2175046.83	17012595.47	884.90	6.724	4.71171	35.0	8.211	0.068	0.07361	47.2	74.9	0.100
50304.52	-15.00	2175049.86	17012591.49	884.90	7.676	5.52871	35.8	9.460	0.103	0.10756	46.2	77.8	0.149
50304.52	-10.00	2175052.89	17012587.51	884.90	8.598	6.35399	36.5	10.691	0.141	0.14644	46.1	80.9	0.203
50304.52	-5.00	2175055.92	17012583.54	884.90	9.349	7.04960	37.0	11.709	0.174	0.18232	46.3	84.4	0.252
50304.52	0.00	2175058.95	17012579.56	884.90	9.760	7.44062	37.3	12.273	0.194	0.20337	46.4	88.3	0.281
50304.52	5.00	2175061.98	17012575.58	884.90	9.716	7.40226	37.3	12.214	0.192	0.20063	46.3	92.4	0.278
50304.52	10.00	2175065.01	17012571.61	884.90	9.229	6.94777	37.0	11.552	0.170	0.17523	45.9	96.3	0.244
50304.52	15.00	2175068.04	17012567.63	884.90	8.434	6.21809	36.4	10.478	0.135	0.13747	45.5	99.7	0.193
50304.52	20.00	2175071.08	17012563.65	884.90	7.497	5.38637	35.7	9.231	0.097	0.09882	45.4	102.8	0.139
50304.52	25.00	2175074.11	17012559.68	884.90	6.551	4.57987	35.0	7.993	0.064	0.06622	46.2	105.8	0.092
50304.52	30.00	2175077.14	17012555.70	884.90	5.673	3.86317	34.3	6.864	0.036	0.04169	48.8	109.6	0.055
50304.52	35.00	2175080.17	17012551.72	884.90	4.898	3.25561	33.6	5.881	0.017	0.02451	55.3	115.4	0.030
50304.52	40.00	2175083.20	17012547.75	884.90	4.230	2.75279	33.1	5.047	0.007	0.01303	61.8	121.9	0.013
50304.52	45.00	2175086.23	17012543.77	884.90	3.664	2.34095	32.6	4.348	0.011	0.00575	28.0	72.8	0.011
50304.52	50.00	2175089.26	17012539.79	884.90	3.187	2.00443	32.2	3.765	0.016	0.00222	7.9	79.7	0.016
50304.52	55.00	2175092.29	17012535.82	884.90	2.786	1.72883	31.8	3.279	0.019	0.00323	9.5	84.8	0.019
50304.52	60.00	2175095.32	17012531.84	884.90	2.448	1.50202	31.5	2.872	0.021	0.00470	12.6	87.5	0.022
50304.52	65.00	2175098.35	17012527.86	884.90	2.163	1.31418	31.3	2.531	0.022	0.00560	14.4	89.2	0.023
50304.52	70.00	2175101.39	17012523.89	884.90	1.921	1.15754	31.1	2.243	0.022	0.00606	15.5	90.2	0.023
50304.52	75.00	2175104.42	17012519.91	884.90	1.715	1.02599	30.9	1.999	0.021	0.00622	16.2	90.8	0.022
50304.52	80.00	2175107.45	17012515.93	884.90	1.538	0.91471	30.7	1.790	0.021	0.00620	16.7	91.2	0.022
50304.52	85.00	2175110.48	17012511.96	884.90	1.386	0.81993	30.6	1.611	0.020	0.00605	17.0	91.5	0.021
50304.52	90.00	2175113.51	17012507.98	884.90	1.255	0.73869	30.5	1.456	0.019	0.00584	17.2	91.7	0.020
50304.52	95.00	2175116.54	17012504.01	884.90	1.140	0.66860	30.4	1.322	0.018	0.00559	17.3	91.8	0.019
50304.52	100.00	2175119.57	17012500.03	884.90	1.040	0.60777	30.3	1.205	0.017	0.00532	17.4	91.9	0.018
50304.52	105.00	2175122.60	17012496.05	884.90	0.952	0.55470	30.2	1.102	0.016	0.00504	17.5	92.0	0.017
50304.52	110.00	2175125.63	17012492.08	884.90	0.875	0.50815	30.1	1.012	0.015	0.00477	17.5	92.0	0.016
50304.52	115.00	2175128.66	17012488.10	884.90	0.806	0.46711	30.1	0.932	0.014	0.00451	17.6	92.0	0.015
50304.52	120.00	2175132.69	17012484.12	884.90	0.745	0.43078	30.0	0.861	0.013	0.00426	17.6	92.0	0.014
50304.52	125.00	2175134.73	17012480.15	884.90	0.691	0.39846	30.0	0.797	0.013	0.00402	17.6	92.0	0.013
50304.52	130.00	2175137.76	17012476.17	884.90	0.642	0.36961	29.9	0.741	0.012	0.00380	17.6	92.0	0.013
50304.52	135.00	2175140.79	17012472.19	884.90	0.598	0.34374	29.9	0.690	0.011	0.00359	17.6	91.9	0.012
50304.52	140.00	2175143.82	17012468.22	884.90	0.558	0.32047	29.9	0.644	0.011	0.00340	17.7	91.9	0.011
50304.52	145.00	2175146.85	17012464.24	884.90	0.523	0.29947	29.8	0.602	0.010	0.00321	17.7	91.9	0.011
50304.52	150.00	2175149.88	17012460.26	884.90	0.490	0.28046	29.8	0.565	0.010	0.00304	17.7	91.9	0.010
50304.52	155.00	2175152.91	17012456.29	884.90	0.460	0.26318	29.8	0.530	0.009	0.00288	17.7	91.8	0.010
50304.52	160.00	2175155.94	17012452.31	884.90	0.433	0.24745	29.7	0.499	0.009	0.00273	17.7	91.8	0.009
50304.52	165.00	2175158.97	17012448.33	884.90	0.409	0.23309	29.7	0.470	0.008	0.00260	17.7	91.8	0.009
50304.52	170.00	2175162.00	17012444.36	884.90	0.386	0.21993	29.7	0.444	0.008	0.00247	17.6	91.7	0.008
50304.52	175.00	2175165.04	17012440.38	884.90	0.365	0.20786	29.7	0.420	0.007	0.00235	17.6	91.7	0.008
50304.52	180.00	2175168.07	17012436.40	884.90	0.346	0.19676	29.6	0.398	0.007	0.00223	17.6	91.7	0.007
50304.52	185.00	2175171.10	17012432.43	884.90	0.328	0.18652	29.6	0.377	0.007	0.00213	17.6	91.6	0.007
50304.52	190.00	2175174.13	17012428.45	884.90	0.312	0.17706	29.6	0.359	0.006	0.00203	17.6	91.6	0.007
50304.52	195.00	2175177.16	17012424.47	884.90	0.297	0.16831	29.6	0.341	0.006	0.00194	17.6	91.6	0.006
50304.52	200.00	2175180.19	17012420.50	884.90	0.282	0.16019	29.6	0.325	0.006	0.00185	17.6	91.5	0.006
50304.52	205.00	2175183.22	17012416.52	884.90	0.269	0.15265	29.5	0.310	0.006	0.00177	17.6	91.5	0.006
50304.52	210.00	2175186.25	17012412.54	884.90	0.257	0.14563	29.5	0.295	0.005	0.00169	17.6	91.5	0.0

50304.52	235.00	2175201.41	17012392.66	884.90	0.207	0.11691	29.5	0.238	0.004	0.00138	17.6	91.4	0.005
50304.52	240.00	2175204.44	17012388.68	884.90	0.199	0.11221	29.4	0.228	0.004	0.00132	17.6	91.3	0.004
50304.52	245.00	2175207.47	17012384.71	884.90	0.191	0.10778	29.4	0.219	0.004	0.00127	17.6	91.3	0.004
50304.52	250.00	2175210.50	17012380.73	884.90	0.184	0.10362	29.4	0.211	0.004	0.00123	17.6	91.3	0.004
50304.52	255.00	2175213.53	17012376.75	884.90	0.177	0.09969	29.4	0.203	0.004	0.00118	17.6	91.3	0.004
50304.52	260.00	2175216.56	17012372.78	884.90	0.170	0.09599	29.4	0.196	0.004	0.00114	17.6	91.2	0.004
50304.52	265.00	2175219.59	17012368.80	884.90	0.164	0.09250	29.4	0.189	0.003	0.00110	17.6	91.2	0.004
50304.52	270.00	2175222.62	17012364.82	884.90	0.158	0.08919	29.4	0.182	0.003	0.00106	17.6	91.2	0.004
50304.52	275.00	2175225.65	17012360.85	884.90	0.153	0.08606	29.4	0.176	0.003	0.00102	17.6	91.2	0.003
50304.52	280.00	2175228.69	17012356.87	884.90	0.148	0.08310	29.4	0.170	0.003	0.00099	17.6	91.2	0.003
50304.52	285.00	2175231.72	17012352.89	884.90	0.143	0.08029	29.3	0.164	0.003	0.00096	17.6	91.1	0.003
50304.52	290.00	2175234.75	17012348.92	884.90	0.138	0.07762	29.3	0.158	0.003	0.00092	17.6	91.1	0.003
50304.52	295.00	2175237.78	17012344.94	884.90	0.134	0.07509	29.3	0.153	0.003	0.00089	17.6	91.1	0.003
50304.52	300.00	2175240.81	17012340.97	884.90	0.129	0.07268	29.3	0.148	0.003	0.00087	17.6	91.1	0.003

PLS-CADD Version 15.00x64 12:05:42 PM Friday, December 14, 2018
 Sargent & Lundy
 Project Name: 'g:\xcel\w3601_str30(w3315)-str199\w3601_str30(w3315)-str199.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

**** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****

**** User may prefer to add other specific load cases utilizing alternative Strength Factors ****

**** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
 Cross section offset for graph +/-: 300.00 (ft)
 Result interval for graph: 5.00 (ft)
 Electric field limit: 0.00 (kV/m)
 Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure W3601-165 to structure W3601-166

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
5	1	1	34.5	147.000	0	0.858
5	2	1	34.5	147.000	120	0.858
5	3	1	34.5	147.000	-120	0.858
6	1	1	34.5	147.000	0	0.858
6	2	1	34.5	147.000	120	0.858
6	3	1	34.5	147.000	-120	0.858

Calculated EMF Circuit Data For Last Point:

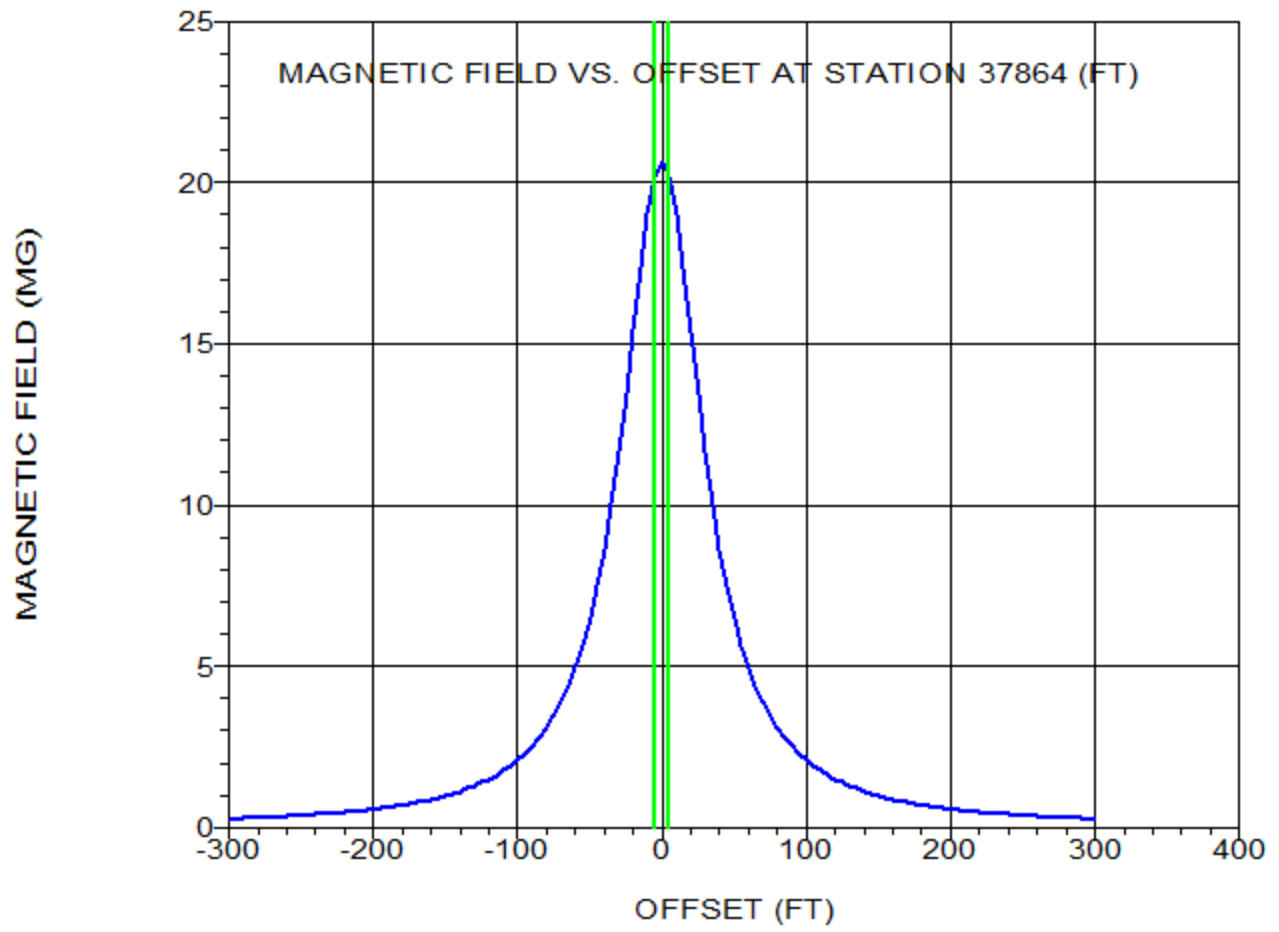
Wire station and offset are based on alignment closest to point on wire.

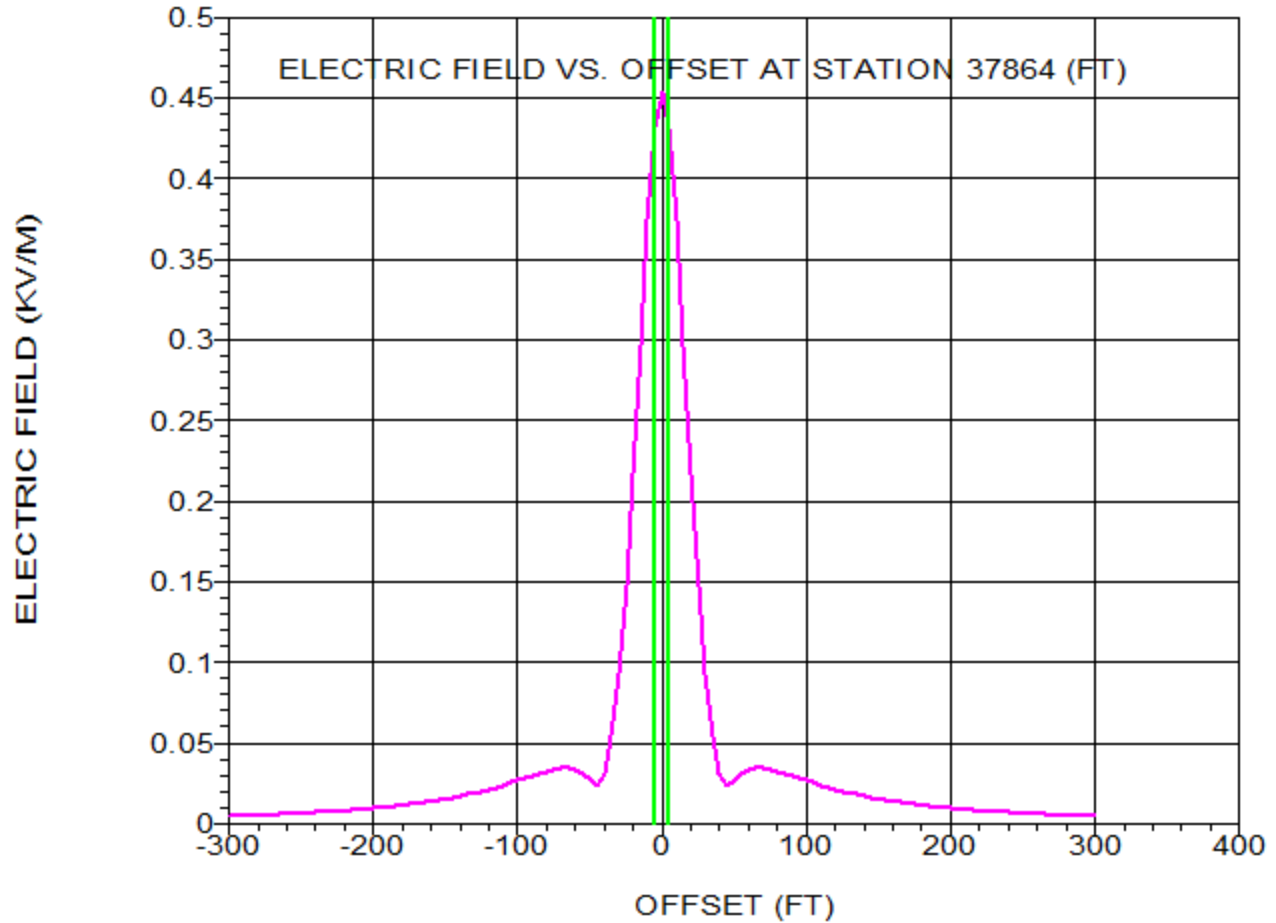
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Wire Voltage To Gnd. (kV)
5	1	212° F Max Sag	RS	Left	2158368.24	16961511.68	974.81	37864.36	4.60	0.858	19.92
5	2	212° F Max Sag	RS	Left	2158368.24	16961511.68	967.81	37864.36	4.60	0.858	19.92
5	3	212° F Max Sag	RS	Left	2158368.24	16961511.68	960.81	37864.36	4.60	0.858	19.92
6	1	212° F Max Sag	RS	Left	2158359.04	16961511.65	974.80	37864.36	-4.60	0.858	19.92
6	2	212° F Max Sag	RS	Left	2158359.04	16961511.65	967.80	37864.36	-4.60	0.858	19.92
6	3	212° F Max Sag	RS	Left	2158359.04	16961511.65	960.80	37864.36	-4.60	0.858	19.92

Maximum magnetic field of 20.61 (mG) found at station 37864.36, offset 0.00 (ft)

Maximum electric field of 0.453 (kV/m) found at station 37864.36, offset 0.00 (ft)





EMF Calculation Results:

Station	Offset	X	Y	Z	B Real	B B Img.	B B Phase Angle	B rms Res.	E Real	E E Img.	E E Phase Angle	E Axis Angle	E rms
Res. (deg)	(ft)	(ft)	(ft)	(ft)	(mG)	(mG)	(deg)	(mG)	(kV/m)	(kV/m)	(deg)		
---	---	---	---	---	---	---	---	---	---	---	---	---	---
37864.36	-300.00	2158063.64	16961510.89	931.31	0.222	0.12873	30.1	0.257	0.004	0.00105	13.8	88.9	0.004
37864.36	-295.00	2158068.64	16961510.90	931.31	0.230	0.13308	30.1	0.265	0.004	0.00109	13.8	88.9	0.005
37864.36	-290.00	2158073.64	16961510.92	931.31	0.238	0.13767	30.1	0.275	0.005	0.00112	13.8	88.9	0.005
37864.36	-285.00	2158078.64	16961510.93	931.31	0.246	0.14249	30.1	0.284	0.005	0.00116	13.8	88.9	0.005
37864.36	-280.00	2158083.64	16961510.94	931.31	0.255	0.14757	30.1	0.294	0.005	0.00120	13.8	88.8	0.005
37864.36	-275.00	2158088.64	16961510.96	931.31	0.264	0.15292	30.1	0.305	0.005	0.00124	13.7	88.8	0.005
37864.36	-270.00	2158093.64	16961510.97	931.31	0.273	0.15857	30.1	0.316	0.005	0.00128	13.7	88.8	0.005
37864.36	-265.00	2158098.64	16961510.98	931.31	0.284	0.16454	30.1	0.328	0.005	0.00133	13.7	88.8	0.006
37864.36	-260.00	2158103.64	16961510.99	931.31	0.294	0.17085	30.1	0.340	0.006	0.00137	13.7	88.8	0.006
37864.36	-255.00	2158108.64	16961511.01	931.31	0.306	0.17753	30.1	0.354	0.006	0.00142	13.7	88.7	0.006
37864.36	-250.00	2158113.64	16961511.02	931.31	0.318	0.18461	30.1	0.368	0.006	0.00148	13.7	88.7	0.006
37864.36	-245.00	2158118.64	16961511.03	931.31	0.331	0.19211	30.1	0.383	0.006	0.00153	13.7	88.7	0.006
37864.36	-240.00	2158123.64	16961511.05	931.31	0.345	0.20008	30.1	0.398	0.007	0.00159	13.7	88.7	0.007
37864.36	-235.00	2158128.64	16961511.06	931.31	0.359	0.20855	30.1	0.415	0.007	0.00165	13.7	88.7	0.007
37864.36	-230.00	2158133.64	16961511.07	931.31	0.375	0.21758	30.2	0.433	0.007	0.00171	13.7	88.6	0.007
37864.36	-225.00	2158138.64	16961511.08	931.31	0.391	0.22719	30.2	0.452	0.007	0.00178	13.6	88.6	0.008
37864.36	-220.00	2158143.64	16961511.10	931.31	0.409	0.23745	30.2	0.473	0.008	0.00186	13.6	88.6	0.008
37864.36	-215.00	2158148.64	16961511.11	931.31	0.427	0.24842	30.2	0.494	0.008	0.00193	13.6	88.6	0.008
37864.36	-210.00	2158153.64	16961511.12	931.31	0.447	0.26017	30.2	0.517	0.008	0.00201	13.6	88.5	0.009
37864.36	-205.00	2158158.64	16961511.14	931.31	0.469	0.27276	30.2	0.542	0.009	0.00210	13.6	88.5	0.009
37864.36	-200.00	2158163.64	16961511.15	931.31	0.492	0.28628	30.2	0.569	0.009	0.00219	13.6	88.5	0.009
37864.36	-195.00	2158168.64	16961511.16	931.31	0.517	0.30082	30.2	0.598	0.010	0.00229	13.5	88.4	0.010
37864.36	-190.00	2158173.64	16961511.17	931.31	0.543	0.31649	30.2	0.629	0.010	0.00239	13.5	88.4	0.010
37864.36	-185.00	2158178.64	16961511.19	931.31	0.572	0.33341	30.2	0.662	0.010	0.00250	13.5	88.4	0.011
37864.36	-180.00	2158183.64	16961511.20	931.31	0.603	0.35171	30.2	0.698	0.011	0.00262	13.5	88.4	0.011
37864.36	-175.00	2158188.64	16961511.21	931.31	0.637	0.37154	30.3	0.737	0.011	0.00274	13.4	88.3	0.012

37864.36	-170.00	2158193.64	16961511.23	931.31	0.673	0.39308	30.3	0.780	0.012	0.00287	13.4	88.3	0.012
37864.36	-165.00	2158198.64	16961511.24	931.31	0.713	0.41653	30.3	0.826	0.013	0.00301	13.3	88.3	0.013
37864.36	-160.00	2158203.64	16961511.25	931.31	0.756	0.44211	30.3	0.876	0.013	0.00315	13.3	88.2	0.014
37864.36	-155.00	2158208.64	16961511.26	931.31	0.803	0.47010	30.3	0.931	0.014	0.00331	13.2	88.2	0.014
37864.36	-150.00	2158213.64	16961511.28	931.31	0.855	0.50079	30.4	0.991	0.015	0.00348	13.2	88.2	0.015
37864.36	-145.00	2158218.64	16961511.29	931.31	0.912	0.53455	30.4	1.057	0.016	0.00365	13.1	88.1	0.016
37864.36	-140.00	2158223.64	16961511.30	931.31	0.975	0.57178	30.4	1.130	0.017	0.00383	13.0	88.1	0.017
37864.36	-135.00	2158228.64	16961511.32	931.31	1.044	0.61298	30.4	1.210	0.017	0.00403	13.0	88.1	0.018
37864.36	-130.00	2158233.64	16961511.33	931.31	1.120	0.65872	30.5	1.299	0.019	0.00423	12.9	88.1	0.019
37864.36	-125.00	2158238.64	16961511.34	931.31	1.205	0.70966	30.5	1.398	0.020	0.00444	12.7	88.0	0.020
37864.36	-120.00	2158243.64	16961511.35	931.31	1.300	0.76663	30.5	1.509	0.021	0.00465	12.6	88.0	0.021
37864.36	-115.00	2158248.64	16961511.37	931.31	1.406	0.83058	30.6	1.633	0.022	0.00486	12.4	88.0	0.023
37864.36	-110.00	2158253.64	16961511.38	931.31	1.524	0.90267	30.6	1.772	0.023	0.00507	12.2	88.0	0.024
37864.36	-105.00	2158258.64	16961511.39	931.31	1.659	0.98429	30.7	1.929	0.025	0.00526	12.0	88.1	0.025
37864.36	-100.00	2158263.64	16961511.41	931.31	1.811	1.07715	30.8	2.107	0.026	0.00543	11.7	88.1	0.027
37864.36	-95.00	2158268.64	16961511.42	931.31	1.983	1.18332	30.8	2.309	0.028	0.00555	11.3	88.2	0.028
37864.36	-90.00	2158273.64	16961511.43	931.31	2.181	1.30537	30.9	2.542	0.029	0.00560	10.9	88.3	0.030
37864.36	-85.00	2158278.64	16961511.44	931.31	2.407	1.44647	31.0	2.808	0.031	0.00554	10.2	88.5	0.031
37864.36	-80.00	2158283.64	16961511.46	931.31	2.669	1.61056	31.1	3.117	0.032	0.00532	9.4	88.8	0.032
37864.36	-75.00	2158288.64	16961511.47	931.31	2.972	1.80258	31.2	3.476	0.033	0.00485	8.3	89.2	0.033
37864.36	-70.00	2158293.64	16961511.48	931.31	3.325	2.02874	31.4	3.895	0.034	0.00402	6.8	89.8	0.034
37864.36	-65.00	2158298.64	16961511.50	931.31	3.739	2.29688	31.6	4.388	0.034	0.00275	4.6	90.6	0.034
37864.36	-60.00	2158303.64	16961511.51	931.31	4.226	2.61684	31.8	4.971	0.033	0.00177	3.1	91.9	0.033
37864.36	-55.00	2158308.64	16961511.52	931.31	4.801	3.00100	32.0	5.662	0.030	0.00433	8.1	93.8	0.030
37864.36	-50.00	2158313.64	16961511.54	931.31	5.481	3.46462	32.3	6.484	0.025	0.00980	21.1	95.6	0.027
37864.36	-45.00	2158318.64	16961511.55	931.31	6.287	4.02609	32.6	7.465	0.018	0.01833	46.1	90.2	0.024
37864.36	-40.00	2158323.64	16961511.56	931.31	7.238	4.70628	33.0	8.633	0.011	0.03120	71.3	72.3	0.031
37864.36	-35.00	2158328.64	16961511.57	931.31	8.351	5.52620	33.5	10.014	0.023	0.05023	65.0	70.3	0.035
37864.36	-30.00	2158333.64	16961511.59	931.31	9.633	6.50109	34.0	11.621	0.052	0.07763	56.3	72.8	0.093
37864.36	-25.00	2158338.64	16961511.60	931.31	11.066	7.62834	34.6	13.440	0.091	0.11551	51.6	75.4	0.147
37864.36	-20.00	2158343.64	16961511.61	931.31	12.591	8.86797	35.2	15.400	0.141	0.16455	49.4	78.0	0.217
37864.36	-15.00	2158348.64	16961511.63	931.31	14.088	10.12067	35.7	17.347	0.197	0.22173	48.4	80.6	0.296
37864.36	-10.00	2158353.64	16961511.64	931.31	15.378	11.22275	36.1	19.038	0.250	0.27839	48.1	83.5	0.374
37864.36	-5.00	2158358.64	16961511.65	931.31	16.258	11.98322	36.4	20.197	0.289	0.32108	48.0	86.7	0.432
37864.36	0.00	2158363.64	16961511.66	931.31	16.570	12.25414	36.5	20.609	0.303	0.33705	48.0	90.0	0.453
37864.36	5.00	2158368.64	16961511.68	931.31	16.257	11.98216	36.4	20.196	0.289	0.32106	48.0	93.3	0.432
37864.36	10.00	2158373.64	16961511.69	931.31	15.377	11.22107	36.1	19.035	0.250	0.27837	48.1	96.5	0.374
37864.36	15.00	2158378.64	16961511.70	931.31	14.086	10.11889	35.7	17.344	0.197	0.22172	48.4	99.4	0.296
37864.36	20.00	2158383.64	16961511.72	931.31	12.589	8.86643	35.2	15.398	0.141	0.16455	49.4	102.0	0.217
37864.36	25.00	2158388.64	16961511.73	931.31	11.064	7.62715	34.6	13.439	0.091	0.11552	51.6	104.6	0.147
37864.36	30.00	2158393.64	16961511.74	931.31	9.632	6.50022	34.0	11.620	0.052	0.07764	56.3	107.2	0.093
37864.36	35.00	2158398.64	16961511.75	931.31	8.350	5.52558	33.5	10.013	0.023	0.05025	65.0	109.7	0.055
37864.36	40.00	2158403.64	16961511.77	931.31	7.237	4.70584	33.0	8.632	0.011	0.03122	71.3	107.7	0.031
37864.36	45.00	2158408.64	16961511.78	931.31	6.286	4.02578	32.6	7.465	0.018	0.01835	46.1	89.8	0.024
37864.36	50.00	2158413.64	16961511.79	931.31	5.481	3.46440	32.3	6.484	0.025	0.00981	21.2	84.4	0.027
37864.36	55.00	2158418.64	16961511.81	931.31	4.800	3.00084	32.0	5.661	0.030	0.00434	8.2	86.2	0.030
37864.36	60.00	2158423.64	16961511.82	931.31	4.226	2.61673	31.8	4.970	0.033	0.00177	3.1	88.1	0.033
37864.36	65.00	2158428.64	16961511.83	931.31	3.739	2.29680	31.6	4.388	0.034	0.00274	4.6	89.4	0.034
37864.36	70.00	2158433.64	16961511.84	931.31	3.325	2.02868	31.4	3.895	0.034	0.00401	6.8	90.2	0.034
37864.36	75.00	2158438.64	16961511.86	931.31	2.972	1.80253	31.2	3.476	0.033	0.00484	8.3	90.8	0.033
37864.36	80.00	2158443.64	16961511.87	931.31	2.669	1.61052	31.1	3.117	0.032	0.00531	9.4	91.2	0.032
37864.36	85.00	2158448.64	16961511.88	931.31	2.407	1.44644	31.0	2.808	0.031	0.00554	10.2	91.5	0.031
37864.36	90.00	2158453.64	16961511.90	931.31	2.181	1.30535	30.9	2.541	0.029	0.00560	10.9	91.7	0.030
37864.36	95.00	2158458.64	16961511.91	931.31	1.983	1.18330	30.8	2.309	0.028	0.00555	11.3	91.8	0.028
37864.36	100.00	2158463.64	16961511.92	931.31	1.810	1.07713	30.8	2.107	0.026	0.00542	11.7	91.9	0.027
37864.36	105.00	2158468.64	16961511.93	931.31	1.659	0.98428	30.7	1.929	0.025	0.00526	12.0	91.9	0.025
37864.36	110.00	2158473.64	16961511.95	931.31	1.524	0.90266	30.6	1.772	0.023	0.00506	12.2	92.0	0.024
37864.36	115.00	2158478.64	16961511.96	931.31	1.405	0.83057	30.6	1.633	0.022	0.00486	12.4	92.0	0.023
37864.36	120.00	2158483.64	16961511.97	931.31	1.300	0.76663	30.5	1.509	0.021	0.00465	12.6	92.0	0.021
37864.36	125.00	2158488.64	16961511.99	931.31	1.205	0.70966	30.5	1.398	0.020	0.00443	12.7	92.0	0.020
37864.36	130.00	2158493.64	16961512.00	931.31	1.120	0.65871	30.5	1.299	0.019	0.00423	12.9	91.9	0.019
37864.36	135.00	2158498.64	16961512.01	931.31	1.044	0.61298	30.4	1.210	0.017	0.00403	13.0	91.9	0.018
37864.36	140.00	2158503.64	16961512.02	931.31	0.975	0.57178	30.4	1.130	0.017	0.00383	13.0	91.9	0.017
37864.36	145.00	2158508.64	16961512.04	931.31	0.912	0.53454	30.4	1.057	0.016	0.00365	13.1	91.9	0.016
37864.36	150.00	2158513.64	16961512.05	931.31	0.855	0.50079	30.4	0.991	0.015	0.00348	13.2	91.8	0.015
37864.36	155.00	2158518.64	16961512.06	931.31	0.803	0.47009	30.3	0.931	0.014	0.00331	13.2	91.8	0.014
37864.36	160.00	2158523.64	16961512.08	931.31	0.756	0.44211	30.3	0.876	0.013	0.00315	13.3	91.8	0.014
37864.36	165.00	2158528.64	16961512.09	931.31	0.713	0.41652	30.3	0.826	0.013	0.00301	13.3	91.7	0.013
37864.36	170.00	2158533.64	16961512.10	931.31	0.673	0.39308	30.3	0.780	0.012	0.00287	13.4	91.7	0.012
37864.36	175.00	2158538.64	16961512.11	931.31	0.637	0.37154	30.3	0.737	0.011	0.00274	13.4	91.7	0.012
37864.36	180.00	2158543.64	16961512.13	931.31	0.603	0.35171	30.2	0.698	0.011	0.00261	13.5	91.6	0.011
37864.36	185.00	2158548.64	16961512.14	931.31	0.572	0.33341	30.2	0.662	0.010	0.00250	13.5	91.6	0.011
37864.36	190.00	2158553.64	16961512.15	931.31	0.543	0.31649	30.2	0.629	0.010	0.00239	13.5	91.6	0.010
37864.36	195.00	2158558.64	16961512.17	931.31	0.517	0.30082	30.2	0.598	0.010	0.00229	13.5	91.6	0.010
37864.36	200.00	2158563.64	16961512.18	931.31	0.492	0.28628	30.2	0.569	0.009	0.00219	13.6	91.5	0.009
37864.36	205.00	2158568.64	16961512.19	931.31	0.469	0.27276	30.2	0.542	0.009	0.00210	13.6	91.5	0.009
37864.36	210.00	2158573.64	16961512.20	931.31	0.447	0.26017	30.2	0.517	0.008	0.00201	13.6		

37864.36	235.00	2158598.64	16961512.27	931.31	0.359	0.20855	30.1	0.415	0.007	0.00165	13.7	91.3	0.007
37864.36	240.00	2158603.64	16961512.28	931.31	0.345	0.20008	30.1	0.398	0.007	0.00159	13.7	91.3	0.007
37864.36	245.00	2158608.64	16961512.29	931.31	0.331	0.19211	30.1	0.383	0.006	0.00153	13.7	91.3	0.006
37864.36	250.00	2158613.64	16961512.31	931.31	0.318	0.18460	30.1	0.368	0.006	0.00148	13.7	91.3	0.006
37864.36	255.00	2158618.64	16961512.32	931.31	0.306	0.17753	30.1	0.354	0.006	0.00142	13.7	91.3	0.006
37864.36	260.00	2158623.64	16961512.33	931.31	0.294	0.17085	30.1	0.340	0.006	0.00137	13.7	91.2	0.006
37864.36	265.00	2158628.64	16961512.35	931.31	0.284	0.16454	30.1	0.328	0.005	0.00133	13.7	91.2	0.006
37864.36	270.00	2158633.64	16961512.36	931.31	0.273	0.15857	30.1	0.316	0.005	0.00128	13.7	91.2	0.005
37864.36	275.00	2158638.64	16961512.37	931.31	0.264	0.15292	30.1	0.305	0.005	0.00124	13.7	91.2	0.005
37864.36	280.00	2158643.64	16961512.38	931.31	0.255	0.14757	30.1	0.294	0.005	0.00120	13.8	91.2	0.005
37864.36	285.00	2158648.64	16961512.40	931.31	0.246	0.14249	30.1	0.284	0.005	0.00116	13.8	91.1	0.005
37864.36	290.00	2158653.64	16961512.41	931.31	0.238	0.13767	30.1	0.275	0.005	0.00112	13.8	91.1	0.005
37864.36	295.00	2158658.64	16961512.42	931.31	0.230	0.13308	30.1	0.265	0.004	0.00109	13.8	91.1	0.005
37864.36	300.00	2158663.64	16961512.44	931.31	0.222	0.12873	30.1	0.257	0.004	0.00105	13.8	91.1	0.004

PLS-CADD Version 15.00x64 12:09:45 PM Friday, December 14, 2018
Sargent & Lundy
Project Name: 'g:\xcel\w3601_str30(w3315)-str199\w3601_str30(w3315)-str199.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

***** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly *****

***** User may prefer to add other specific load cases utilizing alternative Strength Factors *****

***** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER *****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
Cross section offset for graph +/-: 300.00 (ft)
Result interval for graph: 5.00 (ft)
Electric field limit: 0.00 (kV/m)
Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure W3315-30 to structure W3601-52

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
5	1	1	34.5	147.000	0	0.858
5	2	1	34.5	147.000	120	0.858
5	3	1	34.5	147.000	-120	0.858

Calculated EMF Circuit Data For Last Point:

Wire station and offset are based on alignment closest to point on wire.

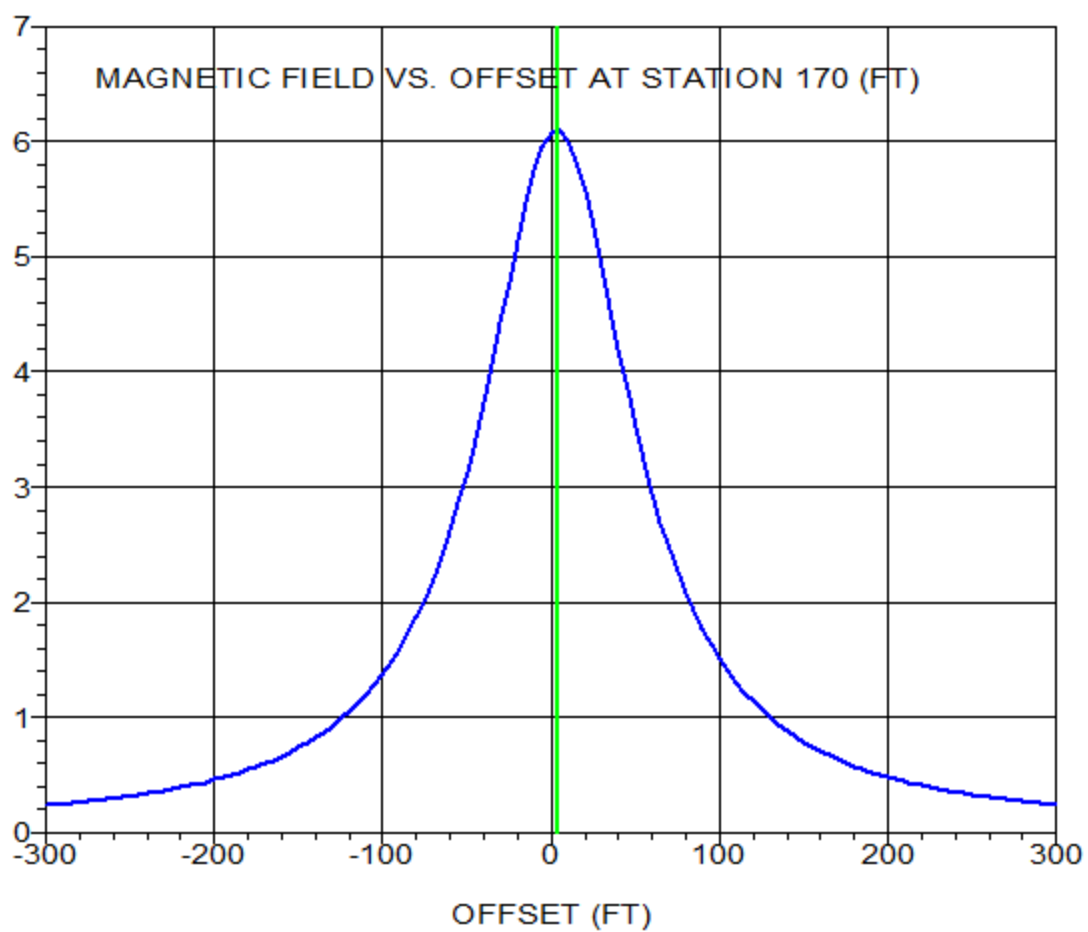
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

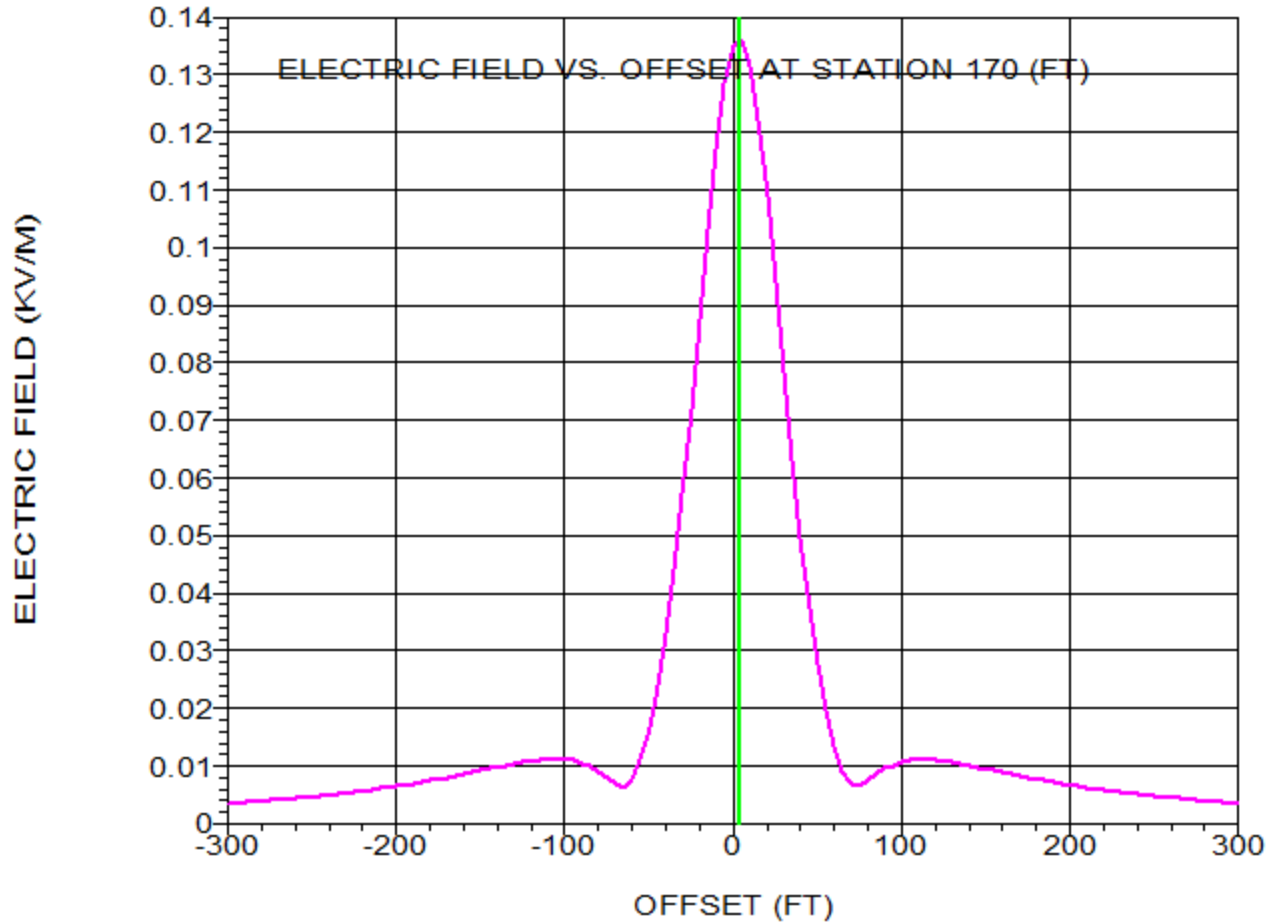
Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Wire Eqv. Diameter (in)	Wire Voltage To Gnd. (kV)
5	1	212° F	Max Sag	RS	Left	2150777.69	16931340.34	707.24	169.58	3.39	0.858 19.92
5	2	212° F	Max Sag	RS	Left	2150777.70	16931340.33	696.23	169.57	3.40	0.858 19.92
5	3	212° F	Max Sag	RS	Left	2150777.79	16931340.31	684.74	169.57	3.49	0.858 19.92

Maximum magnetic field of 6.10 (mG) found at station 169.65, offset 5.00 (ft)

Maximum electric field of 0.136 (kV/m) found at station 169.65, offset 5.00 (ft)

MAGNETIC FIELD (MG)





EMF Calculation Results:

Station	Offset	X	Y	Z	B	B	B	Phase	B	E	E	E	Phase	E	E	Axis	E
(ft)	(ft)	(ft)	(ft)	(ft)	Real	Img.	Angle	Res.	Real	Img.	Angle	Angle	Angle	Angle	Angle	Angle	Res.
					(mG)	(mG)	(deg)	(mG)	(KV/m)	(KV/m)	(deg)	(deg)	(deg)	(deg)	(deg)	(deg)	(KV/m)
169.65	-300.00	2150485.41	16931421.68	636.15	0.199	0.12224	31.6	0.234	0.003	0.00102	17.3	89.0	0.003				
169.65	-295.00	2150490.23	16931420.34	636.15	0.205	0.12562	31.6	0.240	0.003	0.00105	17.3	89.0	0.004				
169.65	-290.00	2150495.04	16931419.00	636.15	0.210	0.12916	31.6	0.247	0.003	0.00108	17.3	89.0	0.004				
169.65	-285.00	2150499.86	16931417.66	636.15	0.216	0.13288	31.5	0.254	0.004	0.00111	17.3	89.0	0.004				
169.65	-280.00	2150504.68	16931416.33	636.15	0.223	0.13679	31.5	0.261	0.004	0.00114	17.3	89.0	0.004				
169.65	-275.00	2150509.49	16931414.99	636.15	0.230	0.14089	31.5	0.269	0.004	0.00117	17.3	89.0	0.004				
169.65	-270.00	2150514.31	16931413.65	636.15	0.237	0.14521	31.5	0.278	0.004	0.00121	17.3	88.9	0.004				
169.65	-265.00	2150519.13	16931412.31	636.15	0.244	0.14975	31.5	0.286	0.004	0.00125	17.3	88.9	0.004				
169.65	-260.00	2150523.95	16931410.97	636.15	0.252	0.15454	31.5	0.295	0.004	0.00129	17.2	88.9	0.004				
169.65	-255.00	2150528.76	16931409.63	636.15	0.260	0.15959	31.5	0.305	0.004	0.00132	17.2	88.9	0.004				
169.65	-250.00	2150533.58	16931408.29	636.15	0.269	0.16492	31.5	0.315	0.004	0.00137	17.2	88.9	0.005				
169.65	-245.00	2150538.40	16931406.95	636.15	0.278	0.17056	31.5	0.326	0.005	0.00141	17.2	88.9	0.005				
169.65	-240.00	2150543.21	16931405.61	636.15	0.288	0.17652	31.5	0.338	0.005	0.00145	17.2	88.9	0.005				
169.65	-235.00	2150548.03	16931404.27	636.15	0.298	0.18284	31.5	0.350	0.005	0.00150	17.1	88.9	0.005				
169.65	-230.00	2150552.85	16931402.93	636.15	0.309	0.18953	31.5	0.362	0.005	0.00155	17.1	88.8	0.005				
169.65	-225.00	2150557.67	16931401.59	636.15	0.320	0.19664	31.5	0.376	0.005	0.00160	17.1	88.8	0.005				
169.65	-220.00	2150562.48	16931400.25	636.15	0.333	0.20419	31.5	0.390	0.005	0.00165	17.0	88.8	0.006				
169.65	-215.00	2150567.30	16931398.91	636.15	0.346	0.21223	31.6	0.406	0.006	0.00171	17.0	88.8	0.006				
169.65	-210.00	2150572.12	16931397.57	636.15	0.359	0.22079	31.6	0.422	0.006	0.00176	17.0	88.8	0.006				
169.65	-205.00	2150576.94	16931396.23	636.15	0.374	0.22992	31.6	0.439	0.006	0.00182	16.9	88.8	0.006				
169.65	-200.00	2150581.75	16931394.89	636.15	0.390	0.23967	31.6	0.458	0.006	0.00188	16.9	88.8	0.006				
169.65	-195.00	2150586.57	16931393.55	636.15	0.407	0.25011	31.6	0.477	0.006	0.00194	16.8	88.8	0.007				
169.65	-190.00	2150591.39	16931392.21	636.15	0.425	0.26128	31.6	0.499	0.007	0.00201	16.8	88.8	0.007				
169.65	-185.00	2150596.20	16931390.88	636.15	0.444	0.27327	31.6	0.521	0.007	0.00207	16.7	88.8	0.007				
169.65	-180.00	2150601.02	16931389.54	636.15	0.465	0.28615	31.6	0.546	0.007	0.00214	16.6	88.8	0.007				
169.65	-175.00	2150605.84	16931388.20	636.15	0.487	0.30001	31.7	0.572	0.007	0.00221	16.6	88.8	0.008				
169.65	-170.00	2150610.66	16931386.86	636.15	0.510	0.31495	31.7	0.600	0.008	0.00227	16.5	88.8	0.008				
169.65	-165.00	2150615.47	16931385.52	636.15	0.536	0.33109	31.7	0.630	0.008	0.00234	16.4	88.8	0.008				

169.65	-160.00	2150620.29	16931384.18	636.15	0.564	0.34854	31.7	0.663	0.008	0.00241	16.2	88.8	0.009
169.65	-155.00	2150625.11	16931382.84	636.15	0.594	0.36745	31.8	0.698	0.009	0.00247	16.1	88.8	0.009
169.65	-150.00	2150629.93	16931381.50	636.15	0.626	0.38799	31.8	0.736	0.009	0.00253	15.9	88.9	0.009
169.65	-145.00	2150634.74	16931380.16	636.15	0.661	0.41033	31.8	0.778	0.009	0.00258	15.8	88.9	0.010
169.65	-140.00	2150639.56	16931378.82	636.15	0.699	0.43468	31.9	0.823	0.009	0.00263	15.5	89.0	0.010
169.65	-135.00	2150644.38	16931377.48	636.15	0.740	0.46129	31.9	0.872	0.010	0.00266	15.3	89.0	0.010
169.65	-130.00	2150649.19	16931376.14	636.15	0.786	0.49042	32.0	0.926	0.010	0.00268	15.0	89.1	0.010
169.65	-125.00	2150654.01	16931374.80	636.15	0.835	0.52238	32.0	0.985	0.010	0.00268	14.6	89.2	0.011
169.65	-120.00	2150658.83	16931373.46	636.15	0.889	0.55753	32.1	1.049	0.011	0.00266	14.1	89.4	0.011
169.65	-115.00	2150663.65	16931372.12	636.15	0.948	0.59628	32.2	1.120	0.011	0.00259	13.6	89.5	0.011
169.65	-110.00	2150668.46	16931370.78	636.15	1.013	0.63909	32.3	1.197	0.011	0.00249	12.9	89.8	0.011
169.65	-105.00	2150673.28	16931369.44	636.15	1.084	0.68650	32.3	1.283	0.011	0.00232	12.0	90.1	0.011
169.65	-100.00	2150678.10	16931368.10	636.15	1.163	0.73912	32.4	1.378	0.011	0.00208	10.8	90.4	0.011
169.65	-95.00	2150682.92	16931366.77	636.15	1.249	0.79767	32.6	1.482	0.011	0.00175	9.2	90.9	0.011
169.65	-90.00	2150687.73	16931365.43	636.15	1.345	0.86296	32.7	1.598	0.010	0.00130	7.1	91.6	0.011
169.65	-85.00	2150692.55	16931364.09	636.15	1.451	0.93591	32.8	1.727	0.010	0.00077	4.4	92.5	0.010
169.65	-80.00	2150697.37	16931362.75	636.15	1.568	1.01755	33.0	1.869	0.009	0.00063	4.0	93.7	0.009
169.65	-75.00	2150702.18	16931361.41	636.15	1.698	1.10907	33.2	2.028	0.008	0.00155	11.0	95.0	0.008
169.65	-70.00	2150707.00	16931360.07	636.15	1.842	1.21176	33.3	2.205	0.006	0.00299	25.0	95.4	0.007
169.65	-65.00	2150711.82	16931358.73	636.15	2.001	1.32700	33.6	2.401	0.004	0.00490	48.2	90.0	0.006
169.65	-60.00	2150716.64	16931357.39	636.15	2.176	1.45624	33.8	2.619	0.002	0.00738	72.5	78.8	0.007
169.65	-55.00	2150721.45	16931356.05	636.15	2.369	1.60090	34.0	2.860	0.003	0.01057	71.8	75.5	0.011
169.65	-50.00	2150726.27	16931354.71	636.15	2.581	1.76220	34.3	3.125	0.008	0.01462	62.2	76.5	0.016
169.65	-45.00	2150731.09	16931353.37	636.15	2.811	1.94098	34.6	3.416	0.013	0.01971	55.8	78.0	0.024
169.65	-40.00	2150735.90	16931352.03	636.15	3.058	2.13727	35.0	3.731	0.020	0.02599	52.0	79.4	0.033
169.65	-35.00	2150740.72	16931350.69	636.15	3.320	2.34987	35.3	4.067	0.029	0.03360	49.6	80.5	0.044
169.65	-30.00	2150745.54	16931349.35	636.15	3.592	2.57566	35.6	4.420	0.038	0.04256	48.1	81.6	0.057
169.65	-25.00	2150750.36	16931348.01	636.15	3.868	2.80892	36.0	4.780	0.049	0.05275	47.3	82.7	0.072
169.65	-20.00	2150755.17	16931346.67	636.15	4.136	3.04068	36.3	5.133	0.060	0.06378	46.9	83.8	0.087
169.65	-15.00	2150759.99	16931345.33	636.15	4.383	3.25852	36.6	5.462	0.071	0.07495	46.7	84.9	0.103
169.65	-10.00	2150764.81	16931343.99	636.15	4.594	3.44709	36.9	5.744	0.080	0.08523	46.7	86.2	0.117
169.65	-5.00	2150769.63	16931342.65	636.15	4.752	3.58999	37.1	5.956	0.088	0.09342	46.7	87.6	0.128
169.65	-0.00	2150774.44	16931341.32	636.15	4.843	3.67265	37.2	6.078	0.092	0.09835	46.8	89.0	0.135
169.65	5.00	2150779.26	16931339.98	636.15	4.857	3.68572	37.2	6.097	0.093	0.09926	46.8	90.4	0.136
169.65	10.00	2150784.08	16931338.64	636.15	4.794	3.62762	37.1	6.012	0.090	0.09599	46.8	91.9	0.132
169.65	15.00	2150788.89	16931337.30	636.15	4.659	3.50499	37.0	5.830	0.084	0.08909	46.8	93.2	0.122
169.65	20.00	2150793.71	16931335.96	636.15	4.466	3.33081	36.7	5.571	0.075	0.07959	46.8	94.5	0.109
169.65	25.00	2150798.53	16931334.62	636.15	4.229	3.12123	36.4	5.256	0.064	0.06871	47.0	95.7	0.094
169.65	30.00	2150803.35	16931333.28	636.15	3.966	2.89231	36.1	4.909	0.053	0.05758	47.4	96.8	0.078
169.65	35.00	2150808.16	16931331.94	636.15	3.691	2.65771	35.8	4.548	0.042	0.04702	48.1	97.9	0.063
169.65	40.00	2150812.98	16931330.60	636.15	3.416	2.42773	35.4	4.191	0.032	0.03755	49.3	98.9	0.050
169.65	45.00	2150817.80	16931329.26	636.15	3.149	2.20926	35.1	3.846	0.024	0.02939	51.3	100.0	0.038
169.65	50.00	2150822.62	16931327.92	636.15	2.895	2.00629	34.7	3.522	0.016	0.02257	54.6	101.2	0.028
169.65	55.00	2150827.43	16931326.58	636.15	2.658	1.82067	34.4	3.222	0.010	0.01701	59.9	102.6	0.020
169.65	60.00	2150832.25	16931325.24	636.15	2.439	1.65274	34.1	2.947	0.005	0.01254	68.2	103.8	0.013
169.65	65.00	2150837.07	16931323.90	636.15	2.239	1.50190	33.9	2.696	0.002	0.00899	76.5	103.0	0.009
169.65	70.00	2150841.88	16931322.56	636.15	2.057	1.36702	33.6	2.470	0.003	0.00622	61.3	95.5	0.007
169.65	75.00	2150846.70	16931321.22	636.15	1.892	1.24674	33.4	2.266	0.006	0.00406	36.3	86.7	0.007
169.65	80.00	2150851.52	16931319.88	636.15	1.743	1.13958	33.2	2.082	0.007	0.00240	18.3	85.0	0.008
169.65	85.00	2150856.34	16931318.54	636.15	1.608	1.04413	33.0	1.917	0.009	0.00118	7.8	86.0	0.009
169.65	90.00	2150861.15	16931317.20	636.15	1.486	0.95904	32.8	1.769	0.010	0.00051	3.1	87.1	0.010
169.65	95.00	2150865.97	16931315.87	636.15	1.376	0.88309	32.7	1.635	0.010	0.00084	4.7	88.1	0.010
169.65	100.00	2150870.79	16931314.53	636.15	1.277	0.81519	32.6	1.515	0.011	0.00133	7.2	88.8	0.011
169.65	105.00	2150875.60	16931313.19	636.15	1.187	0.75435	32.4	1.406	0.011	0.00172	9.1	89.4	0.011
169.65	110.00	2150880.42	16931311.85	636.15	1.105	0.69974	32.3	1.308	0.011	0.00201	10.5	89.8	0.011
169.65	115.00	2150885.24	16931310.51	636.15	1.032	0.65060	32.2	1.220	0.011	0.00221	11.6	90.1	0.011
169.65	120.00	2150890.06	16931309.17	636.15	0.965	0.60629	32.2	1.139	0.011	0.00236	12.4	90.4	0.011
169.65	125.00	2150894.87	16931307.83	636.15	0.904	0.56622	32.1	1.066	0.010	0.00245	13.1	90.6	0.011
169.65	130.00	2150899.69	16931306.49	636.15	0.848	0.52992	32.0	1.000	0.010	0.00250	13.7	90.7	0.011
169.65	135.00	2150904.51	16931305.15	636.15	0.797	0.49695	31.9	0.939	0.010	0.00252	14.1	90.8	0.010
169.65	140.00	2150909.33	16931303.81	636.15	0.751	0.46693	31.9	0.884	0.010	0.00252	14.5	90.9	0.010
169.65	145.00	2150914.14	16931302.47	636.15	0.708	0.43955	31.8	0.833	0.009	0.00249	14.8	91.0	0.010
169.65	150.00	2150918.96	16931301.13	636.15	0.669	0.41451	31.8	0.787	0.009	0.00246	15.0	91.1	0.009
169.65	155.00	2150923.78	16931299.79	636.15	0.633	0.39156	31.7	0.744	0.009	0.00242	15.3	91.1	0.009
169.65	160.00	2150928.59	16931298.45	636.15	0.600	0.37049	31.7	0.705	0.009	0.00237	15.4	91.2	0.009
169.65	165.00	2150933.41	16931297.11	636.15	0.569	0.35111	31.7	0.669	0.008	0.00231	15.6	91.2	0.009
169.65	170.00	2150938.23	16931295.77	636.15	0.541	0.33324	31.6	0.635	0.008	0.00225	15.7	91.2	0.008
169.65	175.00	2150943.05	16931294.43	636.15	0.515	0.31674	31.6	0.604	0.008	0.00219	15.9	91.2	0.008
169.65	180.00	2150947.86	16931293.09	636.15	0.490	0.30147	31.6	0.576	0.007	0.00213	16.0	91.2	0.008
169.65	185.00	2150952.68	16931291.76	636.15	0.468	0.28732	31.6	0.549	0.007	0.00206	16.1	91.2	0.007
169.65	190.00	2150957.50	16931290.42	636.15	0.447	0.27418	31.5	0.524	0.007	0.00200	16.2	91.2	0.007
169.65	195.00	2150962.32	16931289.08	636.15	0.427	0.26197	31.5	0.501	0.007	0.00194	16.2	91.2	0.007
169.65	200.00	2150967.13	16931287.74	636.15	0.409	0.25059	31.5	0.479	0.006	0.00188	16.3	91.2	0.007
169.65	205.00	2150971.95	16931286.40	636.15	0.392	0.23997	31.5	0.459	0.006	0.00182	16.4	91.2	0.006
169.65	210.00	2150976.77	16931285.06	636.15	0.376	0.23006	31.5	0.440	0.006	0.00176	16.4	91.2	0.006
169.65	215.00	2150981.58	16931283.72	636.15	0.361	0.22079	31.5	0.423	0.006	0.00171	16.5	91.2	0.006
169.65	220.00	2150986.40	16931282.38	636.15	0.347	0.21210	31.5	0.406	0.006	0.00165	16.5	91.2	0.006
169.65	225.00	2150991.22	16931281.04	636.15	0.333	0.20395	31.5	0.391	0.005	0.00160	16.5	91.2	0.006

169.65	245.00	2151010.49	16931275.68	636.15	0.288	0.17594	31.4	0.337	0.005	0.00141	16.7	91.1	0.005
169.65	250.00	2151015.30	16931274.34	636.15	0.278	0.16991	31.4	0.326	0.005	0.00136	16.7	91.1	0.005
169.65	255.00	2151020.12	16931273.00	636.15	0.269	0.16422	31.4	0.315	0.004	0.00132	16.7	91.1	0.005
169.65	260.00	2151024.94	16931271.66	636.15	0.260	0.15884	31.4	0.305	0.004	0.00128	16.7	91.1	0.004
169.65	265.00	2151029.76	16931270.32	636.15	0.252	0.15374	31.4	0.295	0.004	0.00124	16.8	91.1	0.004
169.65	270.00	2151034.57	16931268.98	636.15	0.244	0.14891	31.4	0.286	0.004	0.00120	16.8	91.1	0.004
169.65	275.00	2151039.39	16931267.64	636.15	0.236	0.14434	31.4	0.277	0.004	0.00117	16.8	91.1	0.004
169.65	280.00	2151044.21	16931266.31	636.15	0.229	0.13999	31.4	0.268	0.004	0.00113	16.8	91.1	0.004
169.65	285.00	2151049.03	16931264.97	636.15	0.222	0.13586	31.4	0.261	0.004	0.00110	16.8	91.0	0.004
169.65	290.00	2151053.84	16931263.63	636.15	0.216	0.13194	31.4	0.253	0.004	0.00107	16.8	91.0	0.004
169.65	295.00	2151058.66	16931262.29	636.15	0.210	0.12820	31.4	0.246	0.003	0.00104	16.9	91.0	0.004
169.65	300.00	2151063.48	16931260.95	636.15	0.204	0.12464	31.4	0.239	0.003	0.00101	16.9	91.0	0.003

PLS-CADD Version 15.00x64 12:34:12 PM Friday, December 14, 2018
 Sargent & Lundy
 Project Name: 'g:\xcel\w3603_str199(w3601)-byf_tp\w3603_str199(w3601)-byf_tp.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

***** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly *****

***** User may prefer to add other specific load cases utilizing alternative Strength Factors *****

***** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER *****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
 Cross section offset for graph +/-: 300.00 (ft)
 Result interval for graph: 5.00 (ft)
 Electric field limit: 0.00 (kV/m)
 Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure W3603-72 to structure W3603-73

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
5	1	1	34.5	176.000	0	0.000
5	2	1	34.5	176.000	120	0.000
5	3	1	34.5	176.000	-120	0.000
6	1	1	34.5	176.000	0	0.858
6	2	1	34.5	176.000	120	0.858
6	3	1	34.5	176.000	-120	0.858

Calculated EMF Circuit Data For Last Point:

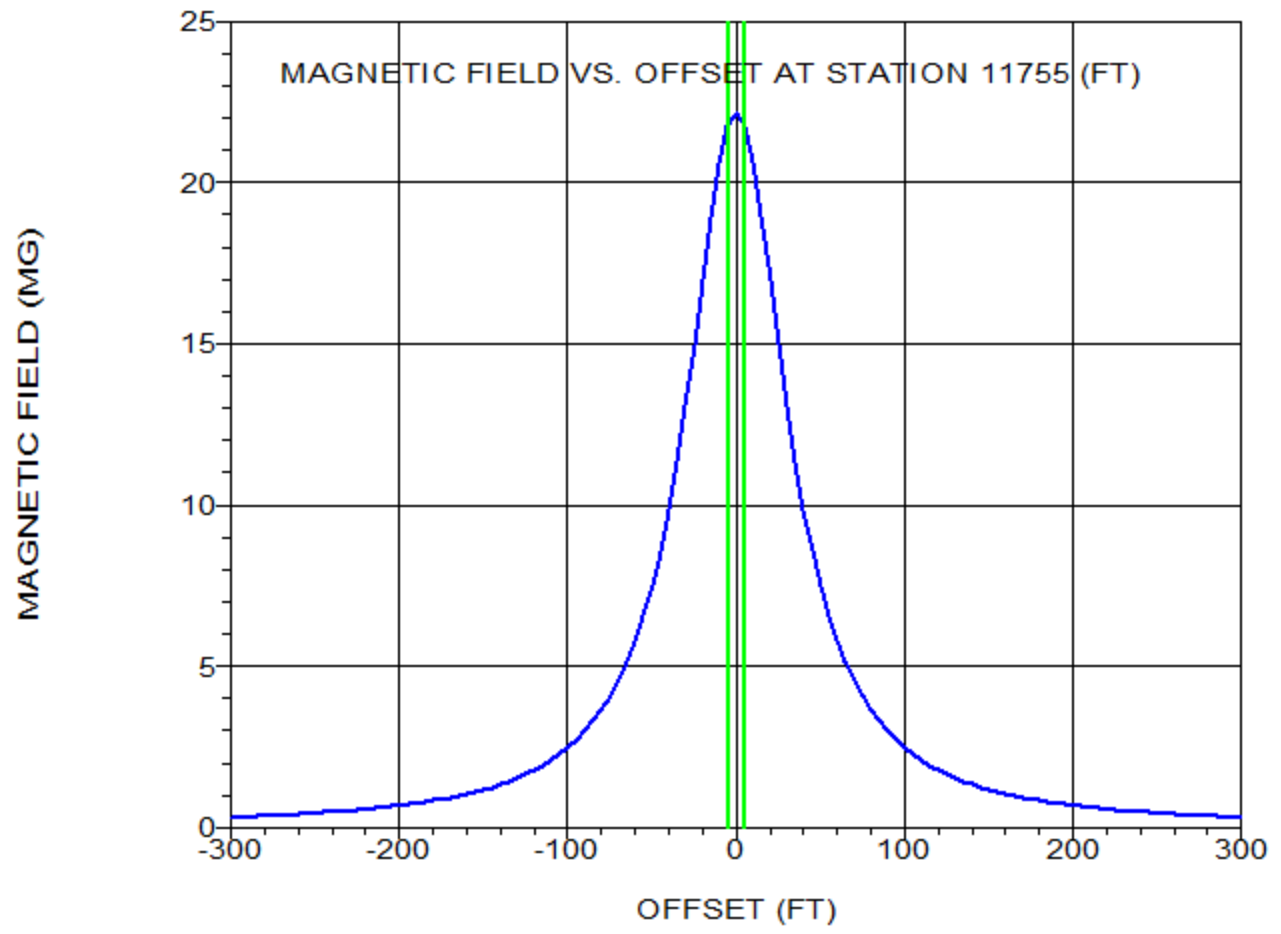
Wire station and offset are based on alignment closest to point on wire.

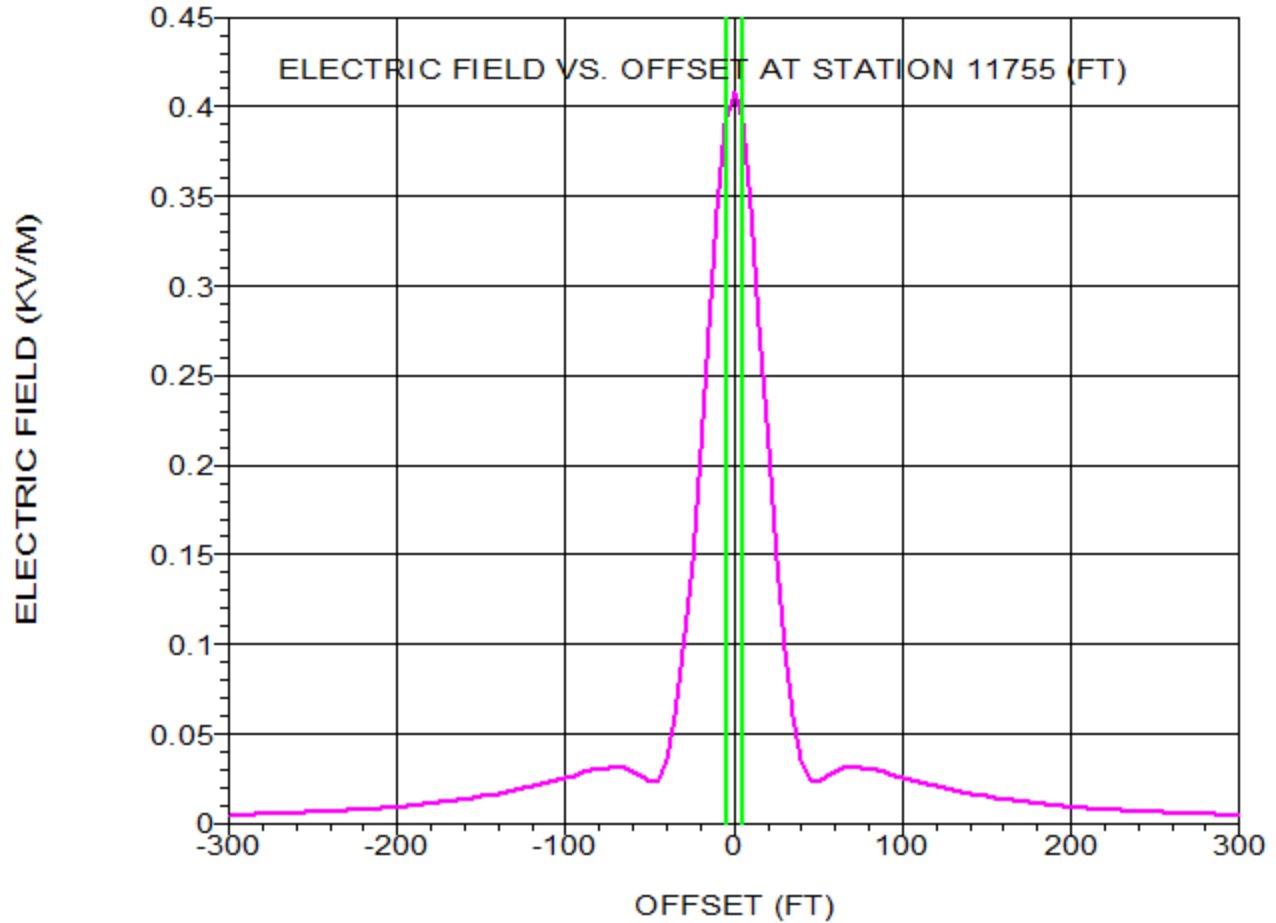
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Wire Voltage To Gnd. (kV)
5	1	212° F	Max Sag	RS	Left	2165832.35	16978350.78	834.70	11754.48	4.63	19.92
5	2	212° F	Max Sag	RS	Left	2165832.35	16978350.78	827.70	11754.48	4.63	19.92
5	3	212° F	Max Sag	RS	Left	2165832.35	16978350.78	820.70	11754.48	4.63	19.92
6	1	212° F	Max Sag	RS	Left	2165823.15	16978350.56	834.68	11754.48	-4.57	19.92
6	2	212° F	Max Sag	RS	Left	2165823.15	16978350.56	827.68	11754.48	-4.57	19.92
6	3	212° F	Max Sag	RS	Left	2165823.15	16978350.56	820.68	11754.48	-4.57	19.92

Maximum magnetic field of 22.15 (mG) found at station 11754.48, offset 0.00 (ft)

Maximum electric field of 0.409 (kV/m) found at station 11754.48, offset 0.00 (ft)





EMF Calculation Results:

Station	Offset	X	Y	Z	B	B B	B Phase	B rms	E	E E	E Phase	E Axis	E rms
Res.					Real	Img.	Angle	Res.	Real	Img.	Angle	Angle	
(ft)	(ft)	(ft)	(ft)	(ft)	(mG)	(mG)	(deg)	(mG)	(kV/m)	(kV/m)	(deg)		
(deg)(kV/m)													

11754.53	-300.00	2165527.80	16978343.73	789.30	0.266	0.15389	30.1	0.307	0.004	0.00102	13.3	88.9	0.004
11754.53	-295.00	2165532.80	16978343.85	789.30	0.274	0.15910	30.1	0.317	0.004	0.00105	13.3	88.9	0.005
11754.53	-290.00	2165537.80	16978343.97	789.30	0.284	0.16457	30.1	0.328	0.005	0.00108	13.3	88.9	0.005
11754.53	-285.00	2165542.79	16978344.08	789.30	0.294	0.17032	30.1	0.340	0.005	0.00112	13.3	88.9	0.005
11754.53	-280.00	2165547.79	16978344.20	789.30	0.304	0.17638	30.1	0.352	0.005	0.00115	13.2	88.8	0.005
11754.53	-275.00	2165552.79	16978344.31	789.30	0.315	0.18277	30.1	0.364	0.005	0.00119	13.2	88.8	0.005
11754.53	-270.00	2165557.79	16978344.43	789.30	0.327	0.18951	30.1	0.378	0.005	0.00123	13.2	88.8	0.005
11754.52	-265.00	2165562.79	16978344.54	789.30	0.339	0.19663	30.1	0.392	0.005	0.00128	13.2	88.8	0.006
11754.52	-260.00	2165567.79	16978344.66	789.30	0.352	0.20416	30.1	0.407	0.006	0.00132	13.2	88.8	0.006
11754.52	-255.00	2165572.79	16978344.77	789.30	0.365	0.21213	30.1	0.423	0.006	0.00137	13.2	88.8	0.006
11754.52	-250.00	2165577.78	16978344.89	789.30	0.380	0.22056	30.1	0.439	0.006	0.00142	13.2	88.7	0.006
11754.52	-245.00	2165582.78	16978345.01	789.30	0.395	0.22951	30.1	0.457	0.006	0.00147	13.2	88.7	0.006
11754.52	-240.00	2165587.78	16978345.12	789.30	0.412	0.23901	30.1	0.476	0.007	0.00152	13.2	88.7	0.007
11754.52	-235.00	2165592.78	16978345.24	789.30	0.429	0.24911	30.2	0.496	0.007	0.00158	13.1	88.7	0.007
11754.52	-230.00	2165597.78	16978345.35	789.30	0.447	0.25987	30.2	0.517	0.007	0.00164	13.1	88.6	0.007
11754.52	-225.00	2165602.78	16978345.47	789.30	0.467	0.27132	30.2	0.540	0.007	0.00171	13.1	88.6	0.008
11754.52	-220.00	2165607.78	16978345.58	789.30	0.488	0.28355	30.2	0.564	0.008	0.00177	13.1	88.6	0.008
11754.52	-215.00	2165612.78	16978345.70	789.30	0.510	0.29661	30.2	0.590	0.008	0.00185	13.1	88.6	0.008
11754.52	-210.00	2165617.77	16978345.81	789.30	0.534	0.31060	30.2	0.618	0.008	0.00192	13.0	88.5	0.009
11754.52	-205.00	2165622.77	16978345.93	789.30	0.559	0.32559	30.2	0.647	0.009	0.00200	13.0	88.5	0.009
11754.51	-200.00	2165627.77	16978346.05	789.30	0.587	0.34168	30.2	0.679	0.009	0.00209	13.0	88.5	0.009
11754.51	-195.00	2165632.77	16978346.16	789.30	0.616	0.35898	30.2	0.713	0.009	0.00218	13.0	88.5	0.010
11754.51	-190.00	2165637.77	16978346.28	789.30	0.648	0.37762	30.2	0.750	0.010	0.00227	12.9	88.4	0.010
11754.51	-185.00	2165642.77	16978346.39	789.30	0.682	0.39773	30.2	0.790	0.010	0.00237	12.9	88.4	0.011
11754.51	-180.00	2165647.77	16978346.51	789.30	0.719	0.41948	30.3	0.832	0.011	0.00248	12.8	88.4	0.011
11754.51	-175.00	2165652.76	16978346.62	789.30	0.759	0.44304	30.3	0.879	0.011	0.00259	12.8	88.3	0.012

11754.51	-170.00	2165657.76	16978346.74	789.30	0.802	0.46862	30.3	0.929	0.012	0.00271	12.8	88.3	0.012
11754.51	-165.00	2165662.76	16978346.85	789.30	0.849	0.49645	30.3	0.984	0.013	0.00283	12.7	88.3	0.013
11754.51	-160.00	2165667.76	16978346.97	789.30	0.901	0.52680	30.3	1.043	0.013	0.00296	12.6	88.3	0.014
11754.51	-155.00	2165672.76	16978347.09	789.30	0.957	0.55598	30.3	1.108	0.014	0.00310	12.6	88.2	0.014
11754.51	-150.00	2165677.76	16978347.20	789.30	1.018	0.59636	30.4	1.180	0.015	0.00325	12.5	88.2	0.015
11754.51	-145.00	2165682.76	16978347.32	789.30	1.085	0.63633	30.4	1.258	0.015	0.00340	12.4	88.2	0.016
11754.51	-140.00	2165687.76	16978347.43	789.30	1.159	0.68040	30.4	1.344	0.016	0.00356	12.3	88.2	0.017
11754.50	-135.00	2165692.75	16978347.55	789.30	1.240	0.72911	30.4	1.439	0.017	0.00372	12.2	88.1	0.018
11754.50	-130.00	2165697.75	16978347.66	789.30	1.330	0.78314	30.5	1.544	0.018	0.00388	12.1	88.1	0.019
11754.50	-125.00	2165702.75	16978347.78	789.30	1.430	0.84327	30.5	1.661	0.019	0.00405	11.9	88.1	0.020
11754.50	-120.00	2165707.75	16978347.90	789.30	1.542	0.91042	30.6	1.791	0.020	0.00422	11.7	88.1	0.021
11754.50	-115.00	2165712.75	16978348.01	789.30	1.666	0.98571	30.6	1.936	0.021	0.00437	11.5	88.1	0.022
11754.50	-110.00	2165717.75	16978348.13	789.30	1.806	1.07047	30.7	2.099	0.023	0.00451	11.2	88.1	0.023
11754.50	-105.00	2165722.73	16978348.24	789.30	1.963	1.16629	30.7	2.283	0.024	0.00463	10.9	88.2	0.024
11754.50	-100.00	2165727.74	16978348.36	789.30	2.141	1.27510	30.8	2.492	0.025	0.00471	10.5	88.3	0.026
11754.50	-95.00	2165732.74	16978348.47	789.30	2.342	1.39926	30.9	2.728	0.027	0.00472	10.0	88.4	0.027
11754.50	-90.00	2165737.73	16978348.59	789.30	2.572	1.54165	30.9	2.999	0.028	0.00464	9.4	88.5	0.028
11754.50	-85.00	2165742.74	16978348.70	789.30	2.835	1.70582	31.0	3.309	0.029	0.00442	8.6	88.7	0.030
11754.50	-80.00	2165747.74	16978348.82	789.30	3.137	1.89615	31.1	3.666	0.030	0.00401	7.6	89.1	0.030
11754.50	-75.00	2165752.74	16978348.94	789.30	3.487	2.11806	31.3	4.080	0.031	0.00332	6.1	89.5	0.031
11754.49	-70.00	2165757.74	16978349.05	789.30	3.892	2.37833	31.4	4.561	0.031	0.00230	4.2	90.2	0.031
11754.49	-65.00	2165762.74	16978349.17	789.30	4.365	2.68533	31.6	5.125	0.031	0.00138	2.6	91.1	0.031
11754.49	-60.00	2165767.73	16978349.28	789.30	4.917	3.04950	31.8	5.786	0.029	0.00310	6.0	92.5	0.029
11754.49	-55.00	2165772.73	16978349.40	789.30	5.565	3.48361	32.0	6.566	0.026	0.00706	15.1	94.1	0.027
11754.49	-50.00	2165777.73	16978349.51	789.30	6.326	4.00307	32.3	7.486	0.021	0.01315	32.4	93.8	0.024
11754.49	-45.00	2165782.73	16978349.63	789.30	7.218	4.62570	32.7	8.573	0.013	0.02216	59.5	83.0	0.024
11754.49	-40.00	2165787.73	16978349.74	789.30	8.259	5.37074	33.0	9.852	0.011	0.03527	73.3	72.3	0.036
11754.49	-35.00	2165792.73	16978349.86	789.30	9.462	6.25571	33.5	11.343	0.027	0.05403	63.4	72.4	0.060
11754.49	-30.00	2165797.73	16978349.98	789.30	10.826	7.28999	34.0	13.052	0.054	0.08016	55.8	74.5	0.097
11754.49	-25.00	2165802.72	16978350.09	789.30	12.326	8.46287	34.5	14.952	0.091	0.11509	51.7	76.8	0.147
11754.49	-20.00	2165807.72	16978350.21	789.30	13.894	9.72642	35.0	16.960	0.135	0.15877	49.6	79.0	0.208
11754.49	-15.00	2165812.72	16978350.32	789.30	15.408	10.97878	35.5	18.919	0.183	0.20810	48.7	81.4	0.277
11754.49	-10.00	2165817.72	16978350.44	789.30	16.695	12.06443	35.9	20.598	0.228	0.25571	48.3	84.1	0.343
11754.48	-5.00	2165822.72	16978350.55	789.30	17.566	12.80821	36.1	21.740	0.261	0.29099	48.1	87.0	0.391
11754.48	0.00	2165827.72	16978350.67	789.30	17.877	13.07436	36.2	22.148	0.273	0.30417	48.1	90.0	0.409
11754.48	5.00	2165832.72	16978350.78	789.30	17.572	12.81270	36.1	21.747	0.261	0.29127	48.1	93.0	0.391
11754.48	10.00	2165837.72	16978350.90	789.30	16.705	12.07287	35.9	20.611	0.229	0.25620	48.3	95.9	0.343
11754.48	15.00	2165842.71	16978351.02	789.30	15.422	10.99002	35.5	18.937	0.184	0.20868	48.6	98.5	0.278
11754.48	20.00	2165847.71	16978351.13	789.30	13.910	9.73895	35.0	16.980	0.136	0.15934	49.6	100.9	0.209
11754.48	25.00	2165852.71	16978351.25	789.30	12.342	8.47536	34.5	14.972	0.091	0.11558	51.7	103.2	0.147
11754.48	30.00	2165857.71	16978351.36	789.30	10.841	7.30156	34.0	13.071	0.055	0.08055	55.7	105.4	0.097
11754.48	35.00	2165862.71	16978351.48	789.30	9.476	6.26596	33.5	11.360	0.027	0.05432	63.2	107.6	0.060
11754.48	40.00	2165867.71	16978351.59	789.30	8.271	5.37958	33.0	9.867	0.011	0.03548	73.3	107.7	0.036
11754.48	45.00	2165872.71	16978351.71	789.30	7.228	4.63322	32.7	8.586	0.013	0.02231	59.9	97.3	0.024
11754.48	50.00	2165877.70	16978351.82	789.30	6.335	4.00941	32.3	7.497	0.021	0.01326	32.8	86.3	0.024
11754.48	55.00	2165882.70	16978351.94	789.30	5.573	3.48896	32.0	6.575	0.026	0.00714	15.4	85.9	0.027
11754.47	60.00	2165887.70	16978352.06	789.30	4.924	3.05401	31.8	5.794	0.029	0.00315	6.2	87.5	0.029
11754.47	65.00	2165892.70	16978352.17	789.30	4.371	2.68915	31.6	5.132	0.031	0.00138	2.6	88.8	0.031
11754.47	70.00	2165897.70	16978352.29	789.30	3.897	2.38157	31.4	4.567	0.031	0.00227	4.2	89.8	0.031
11754.47	75.00	2165902.70	16978352.40	789.30	3.491	2.12083	31.3	4.085	0.031	0.00330	6.1	90.5	0.031
11754.47	80.00	2165907.70	16978352.52	789.30	3.141	1.89852	31.1	3.670	0.030	0.00399	7.5	90.9	0.030
11754.47	85.00	2165912.70	16978352.63	789.30	2.838	1.70787	31.0	3.313	0.029	0.00441	8.6	91.3	0.029
11754.47	90.00	2165917.69	16978352.75	789.30	2.575	1.54343	30.9	3.002	0.028	0.00463	9.4	91.5	0.028
11754.47	95.00	2165922.69	16978352.86	789.30	2.345	1.40081	30.9	2.731	0.027	0.00471	10.0	91.6	0.027
11754.47	100.00	2165927.69	16978352.98	789.30	2.143	1.27646	30.8	2.494	0.025	0.00470	10.5	91.7	0.026
11754.47	105.00	2165932.69	16978353.10	789.30	1.965	1.16748	30.7	2.286	0.024	0.00463	10.9	91.8	0.024
11754.47	110.00	2165937.69	16978353.21	789.30	1.808	1.07153	30.7	2.101	0.023	0.00451	11.2	91.9	0.023
11754.47	115.00	2165942.69	16978353.33	789.30	1.668	0.98665	30.6	1.938	0.022	0.00437	11.5	91.9	0.022
11754.47	120.00	2165947.69	16978353.44	789.30	1.543	0.91126	30.6	1.792	0.020	0.00421	11.7	91.9	0.021
11754.46	125.00	2165952.68	16978353.56	789.30	1.432	0.84401	30.5	1.662	0.019	0.00405	11.9	91.9	0.020
11754.46	130.00	2165957.68	16978353.67	789.30	1.332	0.78381	30.5	1.545	0.018	0.00388	12.0	91.9	0.019
11754.46	135.00	2165962.68	16978353.79	789.30	1.241	0.72971	30.5	1.440	0.017	0.00372	12.2	91.9	0.018
11754.46	140.00	2165967.68	16978353.90	789.30	1.160	0.68094	30.4	1.345	0.016	0.00356	12.3	91.8	0.017
11754.46	145.00	2165972.68	16978354.02	789.30	1.086	0.63683	30.4	1.259	0.015	0.00340	12.4	91.8	0.016
11754.46	150.00	2165977.68	16978354.14	789.30	1.019	0.59681	30.4	1.180	0.015	0.00325	12.5	91.8	0.015
11754.46	155.00	2165982.68	16978354.25	789.30	0.957	0.56040	30.3	1.109	0.014	0.00310	12.6	91.8	0.014
11754.46	160.00	2165987.68	16978354.37	789.30	0.901	0.52718	30.3	1.044	0.013	0.00296	12.6	91.7	0.014
11754.46	165.00	2165992.67	16978354.48	789.30	0.850	0.49679	30.3	0.984	0.013	0.00283	12.7	91.7	0.013
11754.46	170.00	2165997.67	16978354.60	789.30	0.803	0.46893	30.3	0.930	0.012	0.00271	12.7	91.7	0.012
11754.46	175.00	2166002.67	16978354.71	789.30	0.759	0.44333	30.3	0.879	0.011	0.00259	12.8	91.7	0.012
11754.46	180.00	2166007.67	16978354.83	789.30	0.719	0.41974	30.3	0.833	0.011	0.00248	12.8	91.6	0.011
11754.46	185.00	2166012.67	16978354.94	789.30	0.683	0.39798	30.2	0.790	0.010	0.00237	12.9	91.6	0.011
11754.45	190.00	2166017.67	16978355.06	789.30	0.648	0.37785	30.2	0.750	0.010	0.00227	12.9	91.6	0.010
11754.45	195.00	2166022.67	16978355.18	789.30	0.617	0.35919	30.2	0.714	0.009	0.00218	12.9	91.5	0.010
11754.45	200.00	2166027.66	16978355.29	789.30	0.587	0.34187	30.2	0.679	0.009	0.00209	13.0	91.5	0.009
11754.45	205.00	2166032.66	16978355.41	789.30	0.560	0.32577	30.2	0.648	0.009	0.00200	13.0	91.5	0.009
11754.45	210.00	2166037.66	16978355.52	789.30	0.534	0.31077	30.2	0.618	0.008	0.00192	13.0		

11754.45	235.00	2166062.66	16978356.10	789.30	0.429	0.24924	30.2	0.496	0.007	0.00158	13.1	91.3	0.007
11754.45	240.00	2166067.65	16978356.22	789.30	0.412	0.23913	30.1	0.476	0.007	0.00152	13.1	91.3	0.007
11754.45	245.00	2166072.65	16978356.33	789.30	0.395	0.22962	30.1	0.457	0.006	0.00147	13.2	91.3	0.006
11754.45	250.00	2166077.65	16978356.45	789.30	0.380	0.22067	30.1	0.440	0.006	0.00142	13.2	91.3	0.006
11754.44	255.00	2166082.65	16978356.56	789.30	0.366	0.21222	30.1	0.423	0.006	0.00137	13.2	91.2	0.006
11754.44	260.00	2166087.65	16978356.68	789.30	0.352	0.20425	30.1	0.407	0.006	0.00132	13.2	91.2	0.006
11754.44	265.00	2166092.65	16978356.79	789.30	0.339	0.19672	30.1	0.392	0.005	0.00128	13.2	91.2	0.006
11754.44	270.00	2166097.65	16978356.91	789.30	0.327	0.18960	30.1	0.378	0.005	0.00123	13.2	91.2	0.005
11754.44	275.00	2166102.64	16978357.02	789.30	0.315	0.18285	30.1	0.364	0.005	0.00119	13.2	91.2	0.005
11754.44	280.00	2166107.64	16978357.14	789.30	0.304	0.17646	30.1	0.352	0.005	0.00115	13.2	91.2	0.005
11754.44	285.00	2166112.64	16978357.26	789.30	0.294	0.17039	30.1	0.340	0.005	0.00112	13.3	91.1	0.005
11754.44	290.00	2166117.64	16978357.37	789.30	0.284	0.16463	30.1	0.328	0.005	0.00108	13.3	91.1	0.005
11754.44	295.00	2166122.64	16978357.49	789.30	0.275	0.15916	30.1	0.317	0.004	0.00105	13.3	91.1	0.005
11754.44	300.00	2166127.64	16978357.60	789.30	0.266	0.15395	30.1	0.307	0.004	0.00102	13.3	91.1	0.004

PLS-CADD Version 15.00x64 12:31:28 PM Friday, December 14, 2018
 Sargent & Lundy
 Project Name: 'g:\xcel\w3603_str199(w3601)-byf_tp\w3603_str199(w3601)-byf_tp.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

***** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly *****

***** User may prefer to add other specific load cases utilizing alternative Strength Factors *****

***** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER *****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
 Cross section offset for graph +/-: 300.00 (ft)
 Result interval for graph: 5.00 (ft)
 Electric field limit: 0.00 (kV/m)
 Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure WXXXX-Tap to structure WXXXX-Tap 2

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
6	1	1	34.5	176.000	0	0.858
6	2	1	34.5	176.000	120	0.858
6	3	1	34.5	176.000	-120	0.858

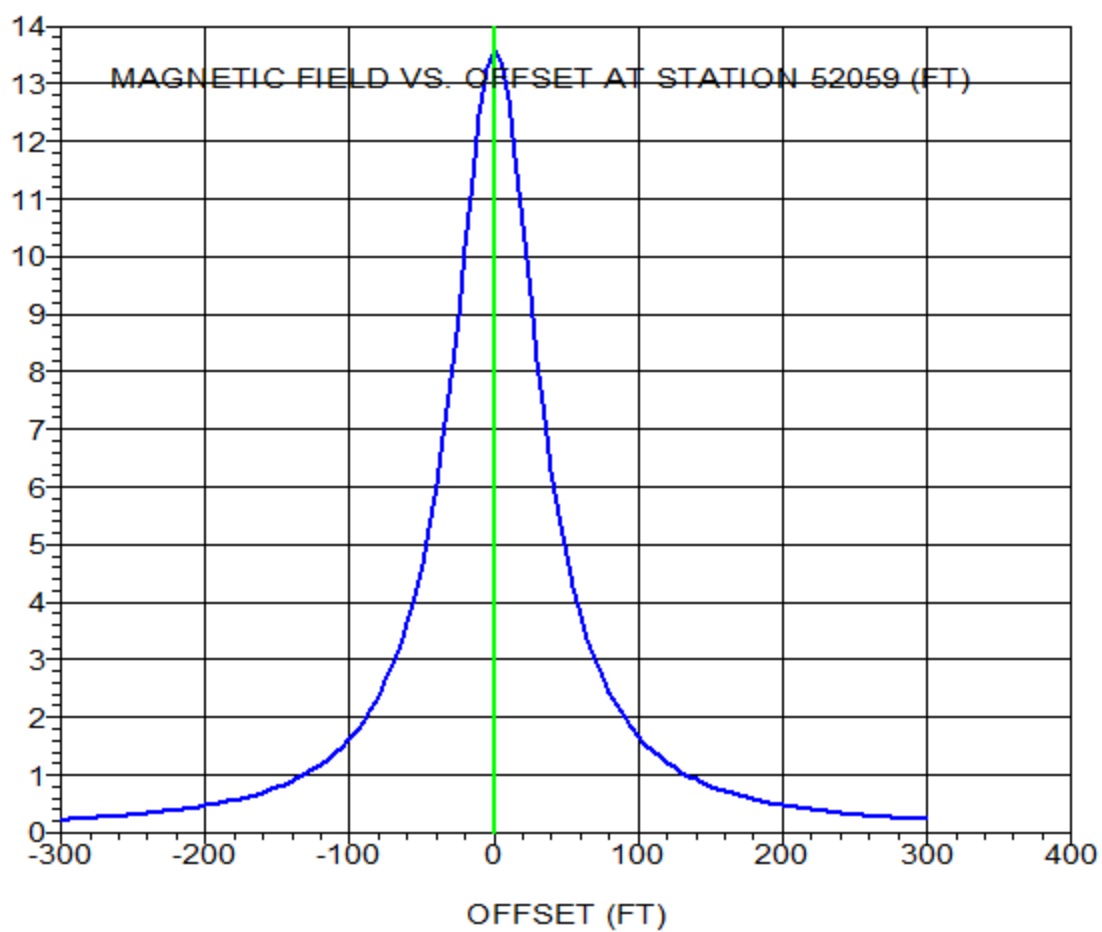
Calculated EMF Circuit Data For Last Point:

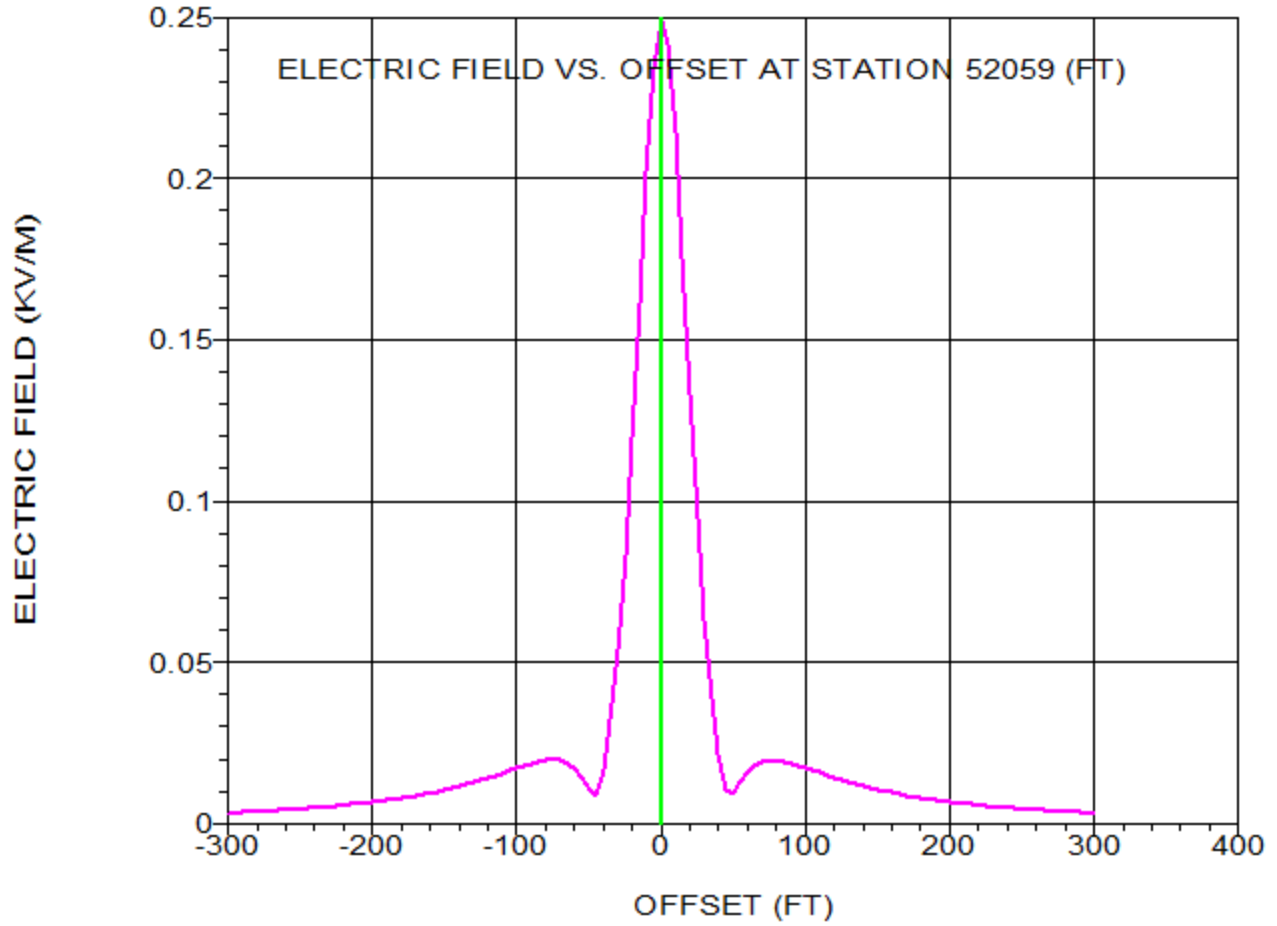
Wire station and offset are based on alignment closest to point on wire.
 In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Wire Voltage To Gnd. (kV)	
6	1	212° F	Max Sag	RS	Left	2174376.08	17012236.48	887.49	52059.07	0.74	0.858	19.92
6	2	212° F	Max Sag	RS	Left	2174376.13	17012236.48	878.01	52059.07	0.78	0.858	19.92
6	3	212° F	Max Sag	RS	Left	2174376.16	17012236.47	868.53	52059.07	0.82	0.858	19.92

Maximum magnetic field of 13.60 (mG) found at station 52059.09, offset 0.00 (ft)
 Maximum electric field of 0.249 (kV/m) found at station 52059.09, offset 0.00 (ft)

MAGNETIC FIELD (MG)





EMF Calculation Results:

Station	Offset	X	Y	Z	B Real	B B Img.	B Phase Angle	B rms Res.	E Real	E E Img.	E Phase Angle	E Axis Angle	E rms
Res.	(ft)	(ft)	(ft)	(ft)	(mG)	(mG)	(deg)	(mG)	(kV/m)	(kV/m)	(deg)		
(deg)	(kV/m)												

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52059.09	-300.00	2174075.43	17012228.98	836.32	0.190	0.11044	30.2	0.220	0.003	0.00100	18.4	88.9	0.003
52059.09	-295.00	2174080.43	17012229.11	836.32	0.196	0.11393	30.2	0.227	0.003	0.00103	18.4	88.9	0.003
52059.09	-290.00	2174085.43	17012229.23	836.32	0.202	0.11760	30.2	0.234	0.003	0.00107	18.4	88.9	0.003
52059.09	-285.00	2174090.43	17012229.36	836.32	0.209	0.12147	30.2	0.242	0.003	0.00110	18.4	88.9	0.003
52059.09	-280.00	2174095.43	17012229.48	836.32	0.216	0.12553	30.2	0.250	0.003	0.00114	18.4	88.9	0.004
52059.09	-275.00	2174100.43	17012229.61	836.32	0.223	0.12982	30.2	0.258	0.004	0.00118	18.4	88.8	0.004
52059.09	-270.00	2174105.42	17012229.73	836.32	0.231	0.13434	30.2	0.267	0.004	0.00122	18.4	88.8	0.004
52059.09	-265.00	2174110.42	17012229.86	836.32	0.239	0.13911	30.2	0.276	0.004	0.00126	18.4	88.8	0.004
52059.09	-260.00	2174115.42	17012229.98	836.32	0.247	0.14414	30.2	0.286	0.004	0.00130	18.4	88.8	0.004
52059.09	-255.00	2174120.42	17012230.11	836.32	0.257	0.14947	30.2	0.297	0.004	0.00135	18.4	88.8	0.004
52059.09	-250.00	2174125.42	17012230.23	836.32	0.266	0.15512	30.2	0.308	0.004	0.00140	18.4	88.8	0.004
52059.09	-245.00	2174130.42	17012230.36	836.32	0.276	0.16110	30.2	0.320	0.004	0.00145	18.4	88.7	0.005
52059.09	-240.00	2174135.41	17012230.48	836.32	0.287	0.16744	30.2	0.332	0.005	0.00151	18.4	88.7	0.005
52059.09	-235.00	2174140.41	17012230.61	836.32	0.299	0.17418	30.3	0.346	0.005	0.00157	18.4	88.7	0.005
52059.09	-230.00	2174145.41	17012230.73	836.32	0.311	0.18136	30.3	0.360	0.005	0.00163	18.4	88.7	0.005
52059.09	-225.00	2174150.41	17012230.86	836.32	0.324	0.18899	30.3	0.375	0.005	0.00169	18.4	88.6	0.005
52059.09	-220.00	2174155.41	17012230.98	836.32	0.338	0.19714	30.3	0.391	0.005	0.00176	18.4	88.6	0.006
52059.09	-215.00	2174160.41	17012231.10	836.32	0.352	0.20584	30.3	0.408	0.006	0.00183	18.4	88.6	0.006
52059.09	-210.00	2174165.41	17012231.23	836.32	0.368	0.21514	30.3	0.426	0.006	0.00191	18.4	88.6	0.006
52059.09	-205.00	2174170.40	17012231.35	836.32	0.385	0.22510	30.3	0.446	0.006	0.00199	18.4	88.6	0.006
52059.09	-200.00	2174175.40	17012231.48	836.32	0.403	0.23579	30.3	0.467	0.006	0.00208	18.4	88.5	0.007
52059.09	-195.00	2174180.40	17012231.60	836.32	0.422	0.24727	30.3	0.489	0.007	0.00217	18.4	88.5	0.007
52059.09	-190.00	2174185.40	17012231.73	836.32	0.443	0.25963	30.4	0.514	0.007	0.00226	18.4	88.5	0.007
52059.09	-185.00	2174190.40	17012231.85	836.32	0.466	0.27295	30.4	0.540	0.007	0.00237	18.4	88.5	0.008
52059.09	-180.00	2174195.40	17012231.98	836.32	0.490	0.28734	30.4	0.568	0.007	0.00248	18.4	88.4	0.008
52059.09	-175.00	2174200.39	17012232.10	836.32	0.516	0.30292	30.4	0.598	0.008	0.00259	18.4	88.4	0.008

52059.09	-170.00	2174205.39	17012232.23	836.32	0.544	0.31981	30.4	0.631	0.008	0.00272	18.4	88.4	0.009
52059.09	-165.00	2174210.39	17012232.35	836.32	0.575	0.33816	30.5	0.667	0.009	0.00285	18.4	88.4	0.009
52059.09	-160.00	2174215.39	17012232.48	836.32	0.608	0.35816	30.5	0.706	0.009	0.00299	18.4	88.3	0.009
52059.09	-155.00	2174220.39	17012232.60	836.32	0.645	0.37999	30.5	0.748	0.009	0.00314	18.4	88.3	0.010
52059.09	-150.00	2174225.39	17012232.73	836.32	0.684	0.40388	30.6	0.795	0.010	0.00329	18.3	88.3	0.010
52059.09	-145.00	2174230.39	17012232.85	836.32	0.728	0.43011	30.6	0.845	0.010	0.00346	18.3	88.3	0.011
52059.09	-140.00	2174235.38	17012232.98	836.32	0.775	0.45896	30.6	0.901	0.011	0.00364	18.3	88.3	0.012
52059.09	-135.00	2174240.38	17012233.10	836.32	0.828	0.49081	30.7	0.962	0.012	0.00382	18.3	88.2	0.012
52059.09	-130.00	2174245.38	17012233.23	836.32	0.886	0.52606	30.7	1.030	0.012	0.00402	18.3	88.2	0.013
52059.09	-125.00	2174250.38	17012233.35	836.32	0.950	0.56521	30.8	1.105	0.013	0.00422	18.2	88.2	0.013
52059.09	-120.00	2174255.38	17012233.48	836.32	1.021	0.60883	30.8	1.188	0.013	0.00443	18.2	88.3	0.014
52059.09	-115.00	2174260.38	17012233.60	836.32	1.100	0.65763	30.9	1.281	0.014	0.00464	18.1	88.3	0.015
52059.09	-110.00	2174265.37	17012233.72	836.32	1.188	0.71241	30.9	1.385	0.015	0.00486	18.1	88.3	0.016
52059.09	-105.00	2174270.37	17012233.85	836.32	1.287	0.77416	31.0	1.502	0.016	0.00507	18.0	88.4	0.016
52059.09	-100.00	2174275.37	17012233.97	836.32	1.398	0.84405	31.1	1.633	0.016	0.00527	17.8	88.5	0.017
52059.09	-95.00	2174280.37	17012234.10	836.32	1.524	0.92353	31.2	1.782	0.017	0.00544	17.7	88.6	0.018
52059.09	-90.00	2174285.37	17012234.22	836.32	1.666	1.01433	31.3	1.951	0.018	0.00557	17.4	88.8	0.019
52059.09	-85.00	2174290.37	17012234.35	836.32	1.828	1.11857	31.5	2.143	0.018	0.00563	17.1	89.1	0.019
52059.09	-80.00	2174295.36	17012234.47	836.32	2.013	1.23885	31.6	2.364	0.019	0.00559	16.6	89.5	0.020
52059.09	-75.00	2174300.36	17012234.60	836.32	2.225	1.37839	31.8	2.618	0.019	0.00538	15.8	90.1	0.020
52059.09	-70.00	2174305.36	17012234.72	836.32	2.469	1.54112	32.0	2.911	0.019	0.00495	14.7	91.0	0.019
52059.09	-65.00	2174310.36	17012234.85	836.32	2.751	1.71391	32.2	3.251	0.018	0.00417	12.9	92.3	0.019
52059.09	-60.00	2174315.36	17012234.97	836.32	3.077	1.95677	32.5	3.647	0.017	0.00297	10.1	94.5	0.017
52059.09	-55.00	2174320.36	17012235.10	836.32	3.456	2.22301	32.8	4.109	0.014	0.00173	6.9	98.2	0.014
52059.09	-50.00	2174325.36	17012235.22	836.32	3.896	2.53941	33.1	4.650	0.011	0.00348	18.2	103.8	0.011
52059.09	-45.00	2174330.35	17012235.35	836.32	4.406	2.91626	33.5	5.284	0.006	0.00817	53.6	78.4	0.008
52059.09	-40.00	2174335.35	17012235.47	836.32	4.996	3.36488	34.0	6.024	0.008	0.01537	62.6	64.0	0.017
52059.09	-35.00	2174340.35	17012235.60	836.32	5.674	3.89645	34.5	6.883	0.019	0.02582	53.2	69.7	0.032
52059.09	-30.00	2174345.35	17012235.72	836.32	6.440	4.51915	35.1	7.867	0.036	0.04051	48.5	73.6	0.054
52059.09	-25.00	2174350.35	17012235.85	836.32	7.285	5.23267	35.7	8.970	0.057	0.06037	46.5	76.3	0.083
52059.09	-20.00	2174355.35	17012235.97	836.32	8.183	6.01891	36.3	10.158	0.083	0.08573	45.8	78.7	0.120
52059.09	-15.00	2174360.34	17012236.09	836.32	9.077	6.82954	37.0	11.359	0.112	0.11537	45.8	81.0	0.161
52059.09	-10.00	2174365.34	17012236.22	836.32	9.874	7.57568	37.5	12.445	0.140	0.14555	46.1	83.5	0.202
52059.09	-5.00	2174370.34	17012236.34	836.32	10.456	8.13337	37.9	13.247	0.162	0.16980	46.4	86.4	0.235
52059.09	0.00	2174375.34	17012236.47	836.32	10.709	8.37957	38.0	13.598	0.172	0.18103	46.5	89.5	0.249
52059.09	5.00	2174380.34	17012236.59	836.32	10.575	8.25085	38.0	13.413	0.167	0.17534	46.5	92.6	0.242
52059.09	10.00	2174385.34	17012236.72	836.32	10.086	7.78090	37.6	12.739	0.148	0.15478	46.2	95.6	0.214
52059.09	15.00	2174390.34	17012236.84	836.32	9.343	7.08010	37.2	11.722	0.122	0.12583	45.9	98.2	0.175
52059.09	20.00	2174395.33	17012236.97	836.32	8.467	6.27776	36.6	10.540	0.093	0.09551	45.7	100.5	0.133
52059.09	25.00	2174400.33	17012237.09	836.32	7.562	5.47598	35.9	9.336	0.066	0.06852	46.1	102.8	0.095
52059.09	30.00	2174405.33	17012237.22	836.32	6.694	4.73549	35.3	8.200	0.043	0.04683	47.6	105.3	0.063
52059.09	35.00	2174410.33	17012237.34	836.32	5.901	4.08265	34.7	7.175	0.025	0.03050	51.1	108.6	0.039
52059.09	40.00	2174415.33	17012237.47	836.32	5.195	3.52226	34.1	6.276	0.011	0.01873	58.7	113.5	0.022
52059.09	45.00	2174420.33	17012237.59	836.32	4.578	3.04809	33.7	5.500	0.005	0.01053	63.9	116.0	0.011
52059.09	50.00	2174425.32	17012237.72	836.32	4.043	2.64946	33.2	4.834	0.009	0.00501	30.0	76.2	0.009
52059.09	55.00	2174430.32	17012237.84	836.32	3.582	2.31489	32.9	4.265	0.013	0.00190	8.4	79.8	0.013
52059.09	60.00	2174435.32	17012237.97	836.32	3.185	2.03367	32.6	3.779	0.016	0.00232	8.4	84.3	0.016
52059.09	65.00	2174440.32	17012238.09	836.32	2.843	1.79650	32.3	3.363	0.017	0.00364	11.8	87.0	0.018
52059.09	70.00	2174445.32	17012238.22	836.32	2.548	1.59560	32.1	3.007	0.018	0.00456	14.0	88.6	0.019
52059.09	75.00	2174450.32	17012238.34	836.32	2.293	1.42457	31.8	2.700	0.019	0.00512	15.3	89.6	0.019
52059.09	80.00	2174455.32	17012238.47	836.32	2.072	1.27819	31.7	2.435	0.019	0.00540	16.2	90.3	0.019
52059.09	85.00	2174460.31	17012238.59	836.32	1.879	1.15224	31.5	2.204	0.018	0.00551	16.8	90.7	0.019
52059.09	90.00	2174465.31	17012238.71	836.32	1.711	1.04328	31.4	2.004	0.018	0.00549	17.2	91.1	0.019
52059.09	95.00	2174470.31	17012238.84	836.32	1.563	0.94854	31.3	1.828	0.017	0.00539	17.5	91.3	0.018
52059.09	100.00	2174475.31	17012238.96	836.32	1.432	0.86575	31.2	1.673	0.016	0.00524	17.7	91.4	0.017
52059.09	105.00	2174480.31	17012239.09	836.32	1.317	0.79305	31.1	1.537	0.016	0.00505	17.8	91.6	0.016
52059.09	110.00	2174485.31	17012239.21	836.32	1.214	0.72893	31.0	1.416	0.015	0.00485	17.9	91.6	0.016
52059.09	115.00	2174490.30	17012239.34	836.32	1.123	0.67213	30.9	1.309	0.014	0.00464	18.0	91.7	0.015
52059.09	120.00	2174495.30	17012239.46	836.32	1.041	0.62161	30.8	1.213	0.014	0.00443	18.1	91.7	0.014
52059.09	125.00	2174500.30	17012239.59	836.32	0.968	0.57649	30.8	1.127	0.013	0.00422	18.1	91.7	0.014
52059.09	130.00	2174505.30	17012239.71	836.32	0.902	0.53606	30.7	1.049	0.012	0.00402	18.2	91.7	0.013
52059.09	135.00	2174510.30	17012239.84	836.32	0.842	0.49970	30.7	0.979	0.012	0.00383	18.2	91.7	0.012
52059.09	140.00	2174515.30	17012239.96	836.32	0.788	0.46689	30.6	0.916	0.011	0.00364	18.2	91.7	0.012
52059.09	145.00	2174520.29	17012240.09	836.32	0.739	0.43719	30.6	0.859	0.011	0.00347	18.2	91.7	0.011
52059.09	150.00	2174525.29	17012240.21	836.32	0.695	0.41023	30.6	0.807	0.010	0.00330	18.3	91.7	0.011
52059.09	155.00	2174530.29	17012240.34	836.32	0.654	0.38569	30.5	0.759	0.010	0.00314	18.3	91.7	0.010
52059.09	160.00	2174535.29	17012240.46	836.32	0.617	0.36328	30.5	0.716	0.009	0.00299	18.3	91.7	0.010
52059.09	165.00	2174540.29	17012240.59	836.32	0.583	0.34278	30.5	0.676	0.009	0.00285	18.3	91.6	0.009
52059.09	170.00	2174545.29	17012240.71	836.32	0.551	0.32398	30.4	0.639	0.008	0.00272	18.3	91.6	0.009
52059.09	175.00	2174550.29	17012240.84	836.32	0.522	0.30669	30.4	0.606	0.008	0.00260	18.3	91.6	0.008
52059.09	180.00	2174555.28	17012240.96	836.32	0.496	0.29077	30.4	0.575	0.007	0.00248	18.3	91.6	0.008
52059.09	185.00	2174560.28	17012241.08	836.32	0.471	0.27606	30.4	0.546	0.007	0.00237	18.3	91.5	0.008
52059.09	190.00	2174565.28	17012241.21	836.32	0.448	0.26246	30.4	0.519	0.007	0.00226	18.3	91.5	0.007
52059.09	195.00	2174570.28	17012241.33	836.32	0.427	0.24985	30.3	0.495	0.007	0.00217	18.3	91.5	0.007
52059.09	200.00	2174575.28	17012241.46	836.32	0.407	0.23814	30.3	0.472	0.006	0.00207	18.3	91.5	0.007
52059.09	205.00	2174580.28	17012241.58	836.32	0.389	0.22725	30.3	0.450	0.006	0.00199	18.3	91.4	0.006
52059.09	210.00	2174585.27	17012241.71	836.32	0.372	0.21711	30.3	0.430	0.006	0.00191	18.3	91.4	

52059.09	235.00	2174610.27	17012242.33	836.32	0.301	0.17549	30.2	0.348	0.005	0.00156	18.3	91.3	0.005
52059.09	240.00	2174615.27	17012242.46	836.32	0.289	0.16865	30.2	0.335	0.005	0.00150	18.3	91.3	0.005
52059.09	245.00	2174620.26	17012242.58	836.32	0.279	0.16221	30.2	0.322	0.004	0.00145	18.3	91.3	0.005
52059.09	250.00	2174625.26	17012242.71	836.32	0.268	0.15615	30.2	0.310	0.004	0.00140	18.3	91.3	0.004
52059.09	255.00	2174630.26	17012242.83	836.32	0.258	0.15043	30.2	0.299	0.004	0.00135	18.3	91.2	0.004
52059.09	260.00	2174635.26	17012242.96	836.32	0.249	0.14504	30.2	0.288	0.004	0.00130	18.3	91.2	0.004
52059.09	265.00	2174640.26	17012243.08	836.32	0.241	0.13994	30.2	0.278	0.004	0.00125	18.3	91.2	0.004
52059.09	270.00	2174645.26	17012243.21	836.32	0.232	0.13512	30.2	0.269	0.004	0.00121	18.3	91.2	0.004
52059.09	275.00	2174650.25	17012243.33	836.32	0.225	0.13055	30.2	0.260	0.004	0.00117	18.3	91.2	0.004
52059.09	280.00	2174655.25	17012243.46	836.32	0.217	0.12622	30.2	0.251	0.003	0.00113	18.3	91.1	0.004
52059.09	285.00	2174660.25	17012243.58	836.32	0.210	0.12211	30.2	0.243	0.003	0.00109	18.3	91.1	0.003
52059.09	290.00	2174665.25	17012243.70	836.32	0.204	0.11821	30.2	0.235	0.003	0.00106	18.2	91.1	0.003
52059.09	295.00	2174670.25	17012243.83	836.32	0.197	0.11451	30.1	0.228	0.003	0.00103	18.2	91.1	0.003
52059.09	300.00	2174675.25	17012243.95	836.32	0.191	0.11098	30.1	0.221	0.003	0.00099	18.2	91.1	0.003

PLS-CADD Version 15.00x64 12:35:13 PM Friday, December 14, 2018
 Sargent & Lundy
 Project Name: 'g:\xcel\w3603_str199(w3601)-byf_tp\w3603_str199(w3601)-byf_tp.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

***** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly *****

***** User may prefer to add other specific load cases utilizing alternative Strength Factors *****

***** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER *****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
 Cross section offset for graph +/-: 300.00 (ft)
 Result interval for graph: 5.00 (ft)
 Electric field limit: 0.00 (kV/m)
 Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure W3603-175 to structure W3603-176

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
5	1	1	34.5	176.000	0	0.000
5	2	1	34.5	176.000	120	0.000
5	3	1	34.5	176.000	-120	0.000

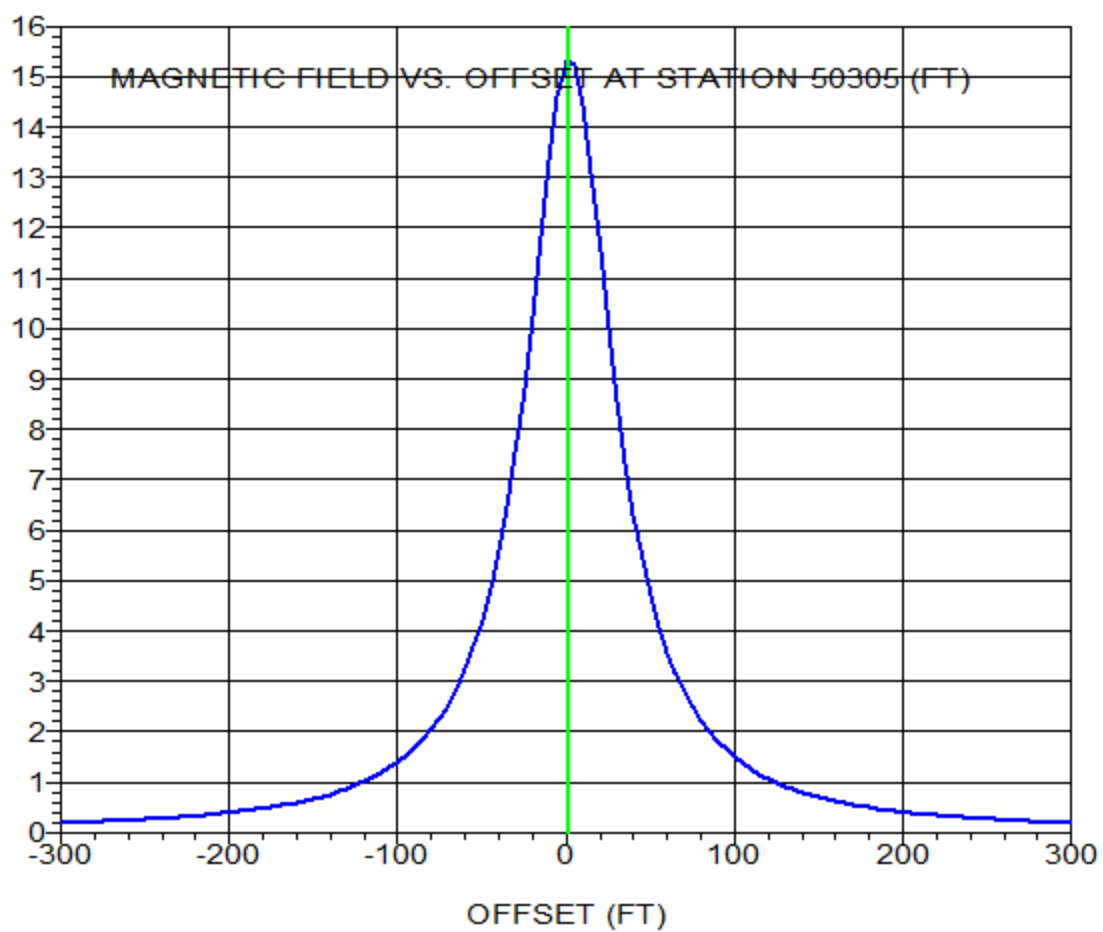
Calculated EMF Circuit Data For Last Point:

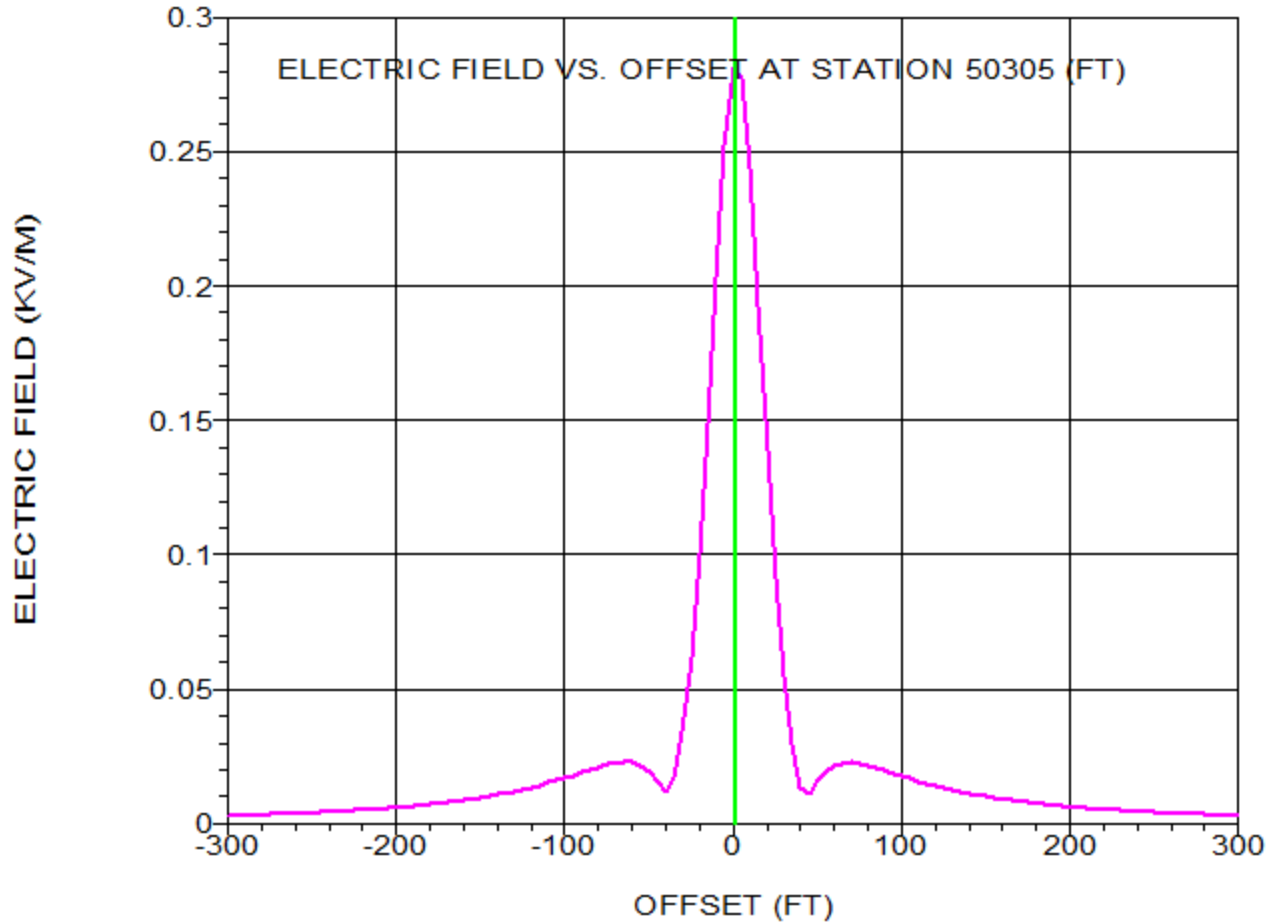
Wire station and offset are based on alignment closest to point on wire.
 In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Wire Voltage To Gnd. (kV)
5	1	212° F	Max Sag	RS	Left	2175060.22	17012577.96	929.47	50304.56	2.04	19.92
5	2	212° F	Max Sag	RS	Left	2175060.28	17012577.88	921.25	50304.56	2.14	19.92
5	3	212° F	Max Sag	RS	Left	2175060.22	17012577.96	913.33	50304.56	2.04	19.92

Maximum magnetic field of 15.32 (mG) found at station 50304.52, offset 0.00 (ft)
 Maximum electric field of 0.281 (kV/m) found at station 50304.52, offset 0.00 (ft)

MAGNETIC FIELD (MG)





EMF Calculation Results:

Station	Offset	X	Y	Z	B Real	B B Img.	B Phase Angle	B rms Res.	E Real	E E Img.	E Phase Angle	E Axis Angle	E rms
Res.	(ft)	(ft)	(ft)	(ft)	(mG)	(mG)	(deg)	(mG)	(kV/m)	(kV/m)	(deg)		
(deg)	(kV/m)												

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50304.52	-300.00	2174877.09	17012818.16	884.90	0.159	0.08878	29.2	0.182	0.003	0.00084	17.4	88.9	0.003
50304.52	-295.00	2174880.12	17012814.18	884.90	0.164	0.09168	29.2	0.188	0.003	0.00087	17.4	88.9	0.003
50304.52	-290.00	2174883.16	17012810.20	884.90	0.170	0.09472	29.2	0.194	0.003	0.00090	17.3	88.9	0.003
50304.52	-285.00	2174886.19	17012806.23	884.90	0.175	0.09793	29.2	0.201	0.003	0.00093	17.3	88.9	0.003
50304.52	-280.00	2174889.22	17012802.25	884.90	0.181	0.10130	29.2	0.208	0.003	0.00096	17.3	88.8	0.003
50304.52	-275.00	2174892.25	17012798.27	884.90	0.187	0.10485	29.2	0.215	0.003	0.00099	17.3	88.8	0.003
50304.52	-270.00	2174895.28	17012794.30	884.90	0.194	0.10860	29.2	0.222	0.003	0.00103	17.3	88.8	0.003
50304.52	-265.00	2174898.31	17012790.32	884.90	0.201	0.11255	29.3	0.230	0.003	0.00106	17.3	88.8	0.004
50304.52	-260.00	2174901.34	17012786.34	884.90	0.208	0.11673	29.3	0.239	0.004	0.00110	17.3	88.8	0.004
50304.52	-255.00	2174904.37	17012782.37	884.90	0.216	0.12115	29.3	0.248	0.004	0.00114	17.3	88.8	0.004
50304.52	-250.00	2174907.40	17012778.39	884.90	0.224	0.12583	29.3	0.257	0.004	0.00118	17.3	88.7	0.004
50304.52	-245.00	2174910.43	17012774.41	884.90	0.233	0.13080	29.3	0.267	0.004	0.00123	17.3	88.7	0.004
50304.52	-240.00	2174913.47	17012770.44	884.90	0.242	0.13607	29.3	0.278	0.004	0.00127	17.3	88.7	0.004
50304.52	-235.00	2174916.50	17012766.46	884.90	0.252	0.14166	29.3	0.289	0.004	0.00132	17.3	88.7	0.004
50304.52	-230.00	2174919.53	17012762.48	884.90	0.262	0.14762	29.4	0.301	0.004	0.00138	17.3	88.6	0.005
50304.52	-225.00	2174922.56	17012758.51	884.90	0.274	0.15396	29.4	0.314	0.005	0.00143	17.3	88.6	0.005
50304.52	-220.00	2174925.59	17012754.53	884.90	0.285	0.16073	29.4	0.328	0.005	0.00149	17.3	88.6	0.005
50304.52	-215.00	2174928.62	17012750.55	884.90	0.298	0.16795	29.4	0.342	0.005	0.00155	17.3	88.6	0.005
50304.52	-210.00	2174931.65	17012746.58	884.90	0.312	0.17569	29.4	0.358	0.005	0.00162	17.3	88.5	0.005
50304.52	-205.00	2174934.68	17012742.60	884.90	0.326	0.18397	29.4	0.374	0.005	0.00169	17.3	88.5	0.006
50304.52	-200.00	2174937.71	17012738.62	884.90	0.341	0.19285	29.5	0.392	0.006	0.00176	17.3	88.5	0.006
50304.52	-195.00	2174940.74	17012734.65	884.90	0.358	0.20241	29.5	0.411	0.006	0.00184	17.3	88.5	0.006
50304.52	-190.00	2174943.77	17012730.67	884.90	0.376	0.21269	29.5	0.432	0.006	0.00193	17.3	88.4	0.006
50304.52	-185.00	2174946.81	17012726.69	884.90	0.395	0.22378	29.5	0.454	0.006	0.00202	17.3	88.4	0.007
50304.52	-180.00	2174949.84	17012722.72	884.90	0.416	0.23577	29.5	0.478	0.007	0.00212	17.3	88.4	0.007
50304.52	-175.00	2174952.87	17012718.74	884.90	0.439	0.24874	29.6	0.504	0.007	0.00222	17.2	88.3	0.007

50304.52	-170.00	2174955.90	17012714.76	884.90	0.463	0.26282	29.6	0.532	0.008	0.00233	17.2	88.3	0.008
50304.52	-165.00	2174958.93	17012710.79	884.90	0.490	0.27814	29.6	0.563	0.008	0.00245	17.2	88.3	0.008
50304.52	-160.00	2174961.96	17012706.81	884.90	0.518	0.29483	29.6	0.596	0.008	0.00257	17.2	88.2	0.009
50304.52	-155.00	2174964.99	17012702.83	884.90	0.550	0.31306	29.7	0.633	0.009	0.00271	17.2	88.2	0.009
50304.52	-150.00	2174968.02	17012698.86	884.90	0.584	0.33303	29.7	0.672	0.009	0.00285	17.2	88.2	0.010
50304.52	-145.00	2174971.05	17012694.88	884.90	0.622	0.35497	29.7	0.716	0.010	0.00301	17.2	88.1	0.010
50304.52	-140.00	2174974.08	17012690.90	884.90	0.663	0.37914	29.8	0.764	0.010	0.00317	17.1	88.1	0.011
50304.52	-135.00	2174977.12	17012686.93	884.90	0.709	0.40583	29.8	0.817	0.011	0.00335	17.1	88.1	0.011
50304.52	-130.00	2174980.15	17012682.95	884.90	0.759	0.43543	29.8	0.875	0.012	0.00353	17.1	88.0	0.012
50304.52	-125.00	2174983.18	17012678.97	884.90	0.815	0.46834	29.9	0.940	0.012	0.00373	17.0	88.0	0.013
50304.52	-120.00	2174986.21	17012675.00	884.90	0.878	0.50508	29.9	1.013	0.013	0.00395	17.0	88.0	0.014
50304.52	-115.00	2174989.24	17012671.02	884.90	0.947	0.54625	30.0	1.094	0.014	0.00417	16.9	88.0	0.014
50304.52	-110.00	2174992.27	17012667.05	884.90	1.025	0.59256	30.0	1.184	0.015	0.00440	16.9	88.0	0.015
50304.52	-105.00	2174995.30	17012663.07	884.90	1.113	0.64490	30.1	1.286	0.015	0.00465	16.8	88.0	0.016
50304.52	-100.00	2174998.33	17012659.09	884.90	1.212	0.70433	30.2	1.402	0.016	0.00489	16.7	88.0	0.017
50304.52	-95.00	2175001.36	17012655.12	884.90	1.324	0.77212	30.2	1.533	0.017	0.00514	16.5	88.1	0.018
50304.52	-90.00	2175004.39	17012651.14	884.90	1.452	0.84989	30.3	1.683	0.018	0.00537	16.3	88.2	0.019
50304.52	-85.00	2175007.43	17012647.16	884.90	1.599	0.93957	30.4	1.855	0.019	0.00557	16.1	88.3	0.020
50304.52	-80.00	2175010.46	17012643.19	884.90	1.768	1.04364	30.6	2.053	0.020	0.00573	15.8	88.5	0.021
50304.52	-75.00	2175013.49	17012639.21	884.90	1.963	1.16515	30.7	2.283	0.021	0.00579	15.3	88.8	0.022
50304.52	-70.00	2175016.52	17012635.23	884.90	2.190	1.30798	30.9	2.551	0.022	0.00572	14.7	89.2	0.023
50304.52	-65.00	2175019.55	17012631.26	884.90	2.455	1.47702	31.0	2.865	0.022	0.00543	13.7	89.9	0.023
50304.52	-60.00	2175022.58	17012627.28	884.90	2.766	1.67851	31.3	3.235	0.022	0.00481	12.2	91.0	0.023
50304.52	-55.00	2175025.61	17012623.30	884.90	3.133	1.92041	31.5	3.675	0.021	0.00372	9.9	92.7	0.022
50304.52	-50.00	2175028.64	17012619.33	884.90	3.568	2.21282	31.8	4.199	0.019	0.00223	6.6	95.5	0.019
50304.52	-45.00	2175031.67	17012615.35	884.90	4.085	2.56845	32.2	4.826	0.016	0.00306	11.0	100.2	0.016
50304.52	-40.00	2175034.70	17012611.37	884.90	4.700	3.00296	32.6	5.577	0.010	0.00800	37.7	100.0	0.012
50304.52	-35.00	2175037.73	17012607.40	884.90	5.428	3.53473	33.1	6.478	0.007	0.01625	65.3	62.3	0.017
50304.52	-30.00	2175040.77	17012603.42	884.90	6.286	4.18332	33.6	7.551	0.019	0.02888	56.6	66.8	0.034
50304.52	-25.00	2175043.80	17012599.44	884.90	7.279	4.96481	34.3	8.811	0.040	0.04750	50.0	71.5	0.062
50304.52	-20.00	2175046.83	17012595.47	884.90	8.394	5.88129	35.0	10.249	0.068	0.07361	47.2	74.9	0.100
50304.52	-15.00	2175049.86	17012591.49	884.90	9.581	6.90108	35.8	11.808	0.103	0.10756	46.2	77.8	0.149
50304.52	-10.00	2175052.89	17012587.51	884.90	10.732	7.93123	36.5	13.345	0.141	0.14644	46.1	80.9	0.203
50304.52	-5.00	2175055.92	17012583.54	884.90	11.669	8.79951	37.0	14.615	0.174	0.18232	46.3	84.4	0.252
50304.52	0.00	2175058.95	17012579.56	884.90	12.182	9.28758	37.3	15.319	0.194	0.20337	46.4	88.3	0.281
50304.52	5.00	2175061.98	17012575.58	884.90	12.127	9.23971	37.3	15.246	0.192	0.20063	46.3	92.4	0.278
50304.52	10.00	2175065.01	17012571.61	884.90	11.520	8.67239	37.0	14.420	0.170	0.17523	45.9	96.3	0.244
50304.52	15.00	2175068.04	17012567.63	884.90	10.527	7.76159	36.4	13.079	0.135	0.13747	45.5	99.7	0.193
50304.52	20.00	2175071.08	17012563.65	884.90	9.358	6.72341	35.7	11.522	0.097	0.09882	45.4	102.8	0.139
50304.52	25.00	2175074.11	17012559.68	884.90	8.177	5.71672	35.0	9.977	0.064	0.06622	46.2	105.8	0.092
50304.52	30.00	2175077.14	17012555.70	884.90	7.082	4.82212	34.3	8.568	0.036	0.04169	48.8	109.6	0.055
50304.52	35.00	2175080.17	17012551.72	884.90	6.114	4.06374	33.6	7.341	0.017	0.02451	55.3	115.4	0.030
50304.52	40.00	2175083.20	17012547.75	884.90	5.281	3.43610	33.1	6.300	0.007	0.01303	61.8	121.9	0.013
50304.52	45.00	2175086.23	17012543.77	884.90	4.574	2.92203	32.6	5.428	0.011	0.00575	28.0	72.8	0.011
50304.52	50.00	2175089.26	17012539.79	884.90	3.979	2.50198	32.2	4.700	0.016	0.00222	7.9	79.7	0.016
50304.52	55.00	2175092.29	17012535.82	884.90	3.478	2.15797	31.8	4.093	0.019	0.00323	9.5	84.8	0.019
50304.52	60.00	2175095.32	17012531.84	884.90	3.056	1.87486	31.5	3.585	0.021	0.00470	12.6	87.5	0.022
50304.52	65.00	2175098.35	17012527.86	884.90	2.700	1.64040	31.3	3.159	0.022	0.00560	14.4	89.2	0.023
50304.52	70.00	2175101.39	17012523.89	884.90	2.398	1.44488	31.1	2.800	0.022	0.00606	15.5	90.2	0.023
50304.52	75.00	2175104.42	17012519.91	884.90	2.141	1.28066	30.9	2.495	0.021	0.00622	16.2	90.8	0.022
50304.52	80.00	2175107.45	17012515.93	884.90	1.920	1.14176	30.7	2.234	0.021	0.00620	16.7	91.2	0.022
50304.52	85.00	2175110.48	17012511.96	884.90	1.731	1.02346	30.6	2.011	0.020	0.00605	17.0	91.5	0.021
50304.52	90.00	2175113.51	17012507.98	884.90	1.566	0.92205	30.5	1.818	0.019	0.00584	17.2	91.7	0.020
50304.52	95.00	2175116.54	17012504.01	884.90	1.423	0.83456	30.4	1.650	0.018	0.00559	17.3	91.8	0.019
50304.52	100.00	2175119.57	17012500.03	884.90	1.299	0.75864	30.3	1.504	0.017	0.00532	17.4	91.9	0.018
50304.52	105.00	2175122.60	17012496.05	884.90	1.189	0.69239	30.2	1.376	0.016	0.00504	17.5	92.0	0.017
50304.52	110.00	2175125.63	17012492.08	884.90	1.092	0.63429	30.1	1.263	0.015	0.00477	17.5	92.0	0.016
50304.52	115.00	2175128.66	17012488.10	884.90	1.007	0.58307	30.1	1.163	0.014	0.00451	17.6	92.0	0.015
50304.52	120.00	2175131.69	17012484.12	884.90	0.930	0.53771	30.0	1.075	0.013	0.00426	17.6	92.0	0.014
50304.52	125.00	2175134.73	17012480.15	884.90	0.862	0.49737	30.0	0.995	0.013	0.00402	17.6	92.0	0.013
50304.52	130.00	2175137.76	17012476.17	884.90	0.801	0.46135	29.9	0.925	0.012	0.00380	17.6	92.0	0.013
50304.52	135.00	2175140.79	17012472.19	884.90	0.746	0.42907	29.9	0.861	0.011	0.00359	17.6	91.9	0.012
50304.52	140.00	2175143.82	17012468.22	884.90	0.697	0.40002	29.9	0.804	0.011	0.00340	17.7	91.9	0.011
50304.52	145.00	2175146.85	17012464.24	884.90	0.652	0.37381	29.8	0.752	0.010	0.00321	17.7	91.9	0.011
50304.52	150.00	2175149.88	17012460.26	884.90	0.612	0.35007	29.8	0.705	0.010	0.00304	17.7	91.9	0.010
50304.52	155.00	2175152.91	17012456.29	884.90	0.575	0.32851	29.8	0.662	0.009	0.00288	17.7	91.8	0.010
50304.52	160.00	2175155.94	17012452.31	884.90	0.541	0.30888	29.7	0.623	0.009	0.00273	17.7	91.8	0.009
50304.52	165.00	2175158.97	17012448.33	884.90	0.510	0.29095	29.7	0.587	0.008	0.00260	17.7	91.8	0.009
50304.52	170.00	2175162.00	17012444.36	884.90	0.482	0.27453	29.7	0.554	0.008	0.00247	17.6	91.7	0.008
50304.52	175.00	2175165.04	17012440.38	884.90	0.456	0.25946	29.7	0.524	0.007	0.00235	17.6	91.7	0.008
50304.52	180.00	2175168.07	17012436.40	884.90	0.432	0.24560	29.6	0.497	0.007	0.00223	17.6	91.7	0.007
50304.52	185.00	2175171.10	17012432.43	884.90	0.410	0.23282	29.6	0.471	0.007	0.00213	17.6	91.6	0.007
50304.52	190.00	2175174.13	17012428.45	884.90	0.389	0.22102	29.6	0.448	0.006	0.00203	17.6	91.6	0.007
50304.52	195.00	2175177.16	17012424.47	884.90	0.370	0.21009	29.6	0.426	0.006	0.00194	17.6	91.6	0.006
50304.52	200.00	2175180.19	17012420.50	884.90	0.353	0.19996	29.6	0.405	0.006	0.00185	17.6	91.5	0.006
50304.52	205.00	2175183.22	17012416.52	884.90	0.336	0.19054	29.5	0.386	0.006	0.00177	17.6	91.5	0.006
50304.52	210.00	2175186.25	17012412.54	884.90	0.321	0.18178	29.5	0.369	0.005	0.00169	17.6	91.	

50304.52	235.00	2175201.41	17012392.66	884.90	0.258	0.14594	29.5	0.297	0.004	0.00138	17.6	91.4	0.005
50304.52	240.00	2175204.44	17012388.68	884.90	0.248	0.14006	29.4	0.285	0.004	0.00132	17.6	91.3	0.004
50304.52	245.00	2175207.47	17012384.71	884.90	0.238	0.13454	29.4	0.274	0.004	0.00127	17.6	91.3	0.004
50304.52	250.00	2175210.50	17012380.73	884.90	0.229	0.12934	29.4	0.263	0.004	0.00123	17.6	91.3	0.004
50304.52	255.00	2175213.53	17012376.75	884.90	0.221	0.12444	29.4	0.253	0.004	0.00118	17.6	91.3	0.004
50304.52	260.00	2175216.56	17012372.78	884.90	0.213	0.11982	29.4	0.244	0.004	0.00114	17.6	91.2	0.004
50304.52	265.00	2175219.59	17012368.80	884.90	0.205	0.11546	29.4	0.235	0.003	0.00110	17.6	91.2	0.004
50304.52	270.00	2175222.62	17012364.82	884.90	0.198	0.11133	29.4	0.227	0.003	0.00106	17.6	91.2	0.004
50304.52	275.00	2175225.65	17012360.85	884.90	0.191	0.10742	29.4	0.219	0.003	0.00102	17.6	91.2	0.003
50304.52	280.00	2175228.69	17012356.87	884.90	0.184	0.10373	29.4	0.212	0.003	0.00099	17.6	91.2	0.003
50304.52	285.00	2175231.72	17012352.89	884.90	0.178	0.10022	29.3	0.205	0.003	0.00096	17.6	91.1	0.003
50304.52	290.00	2175234.75	17012348.92	884.90	0.172	0.09689	29.3	0.198	0.003	0.00092	17.6	91.1	0.003
50304.52	295.00	2175237.78	17012344.94	884.90	0.167	0.09373	29.3	0.191	0.003	0.00089	17.6	91.1	0.003
50304.52	300.00	2175240.81	17012340.97	884.90	0.162	0.09072	29.3	0.185	0.003	0.00087	17.6	91.1	0.003

PLS-CADD Version 15.00x64 3:23:46 PM Monday, December 17, 2018
 Sargent & Lundy
 Project Name: 'g:\xcel\w3601_str30(w3315)-str199\w3601_str30(w3315)-str199.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

**** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****

**** User may prefer to add other specific load cases utilizing alternative Strength Factors ****

**** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
 Cross section offset for graph +/-: 300.00 (ft)
 Result interval for graph: 5.00 (ft)
 Electric field limit: 0.00 (kV/m)
 Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure W3601-165 to structure W3601-166

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
5	1	1	34.5	122.000	0	0.858
5	2	1	34.5	122.000	120	0.858
5	3	1	34.5	122.000	-120	0.858
6	1	1	34.5	122.000	0	0.858
6	2	1	34.5	122.000	120	0.858
6	3	1	34.5	122.000	-120	0.858

Calculated EMF Circuit Data For Last Point:

Wire station and offset are based on alignment closest to point on wire.

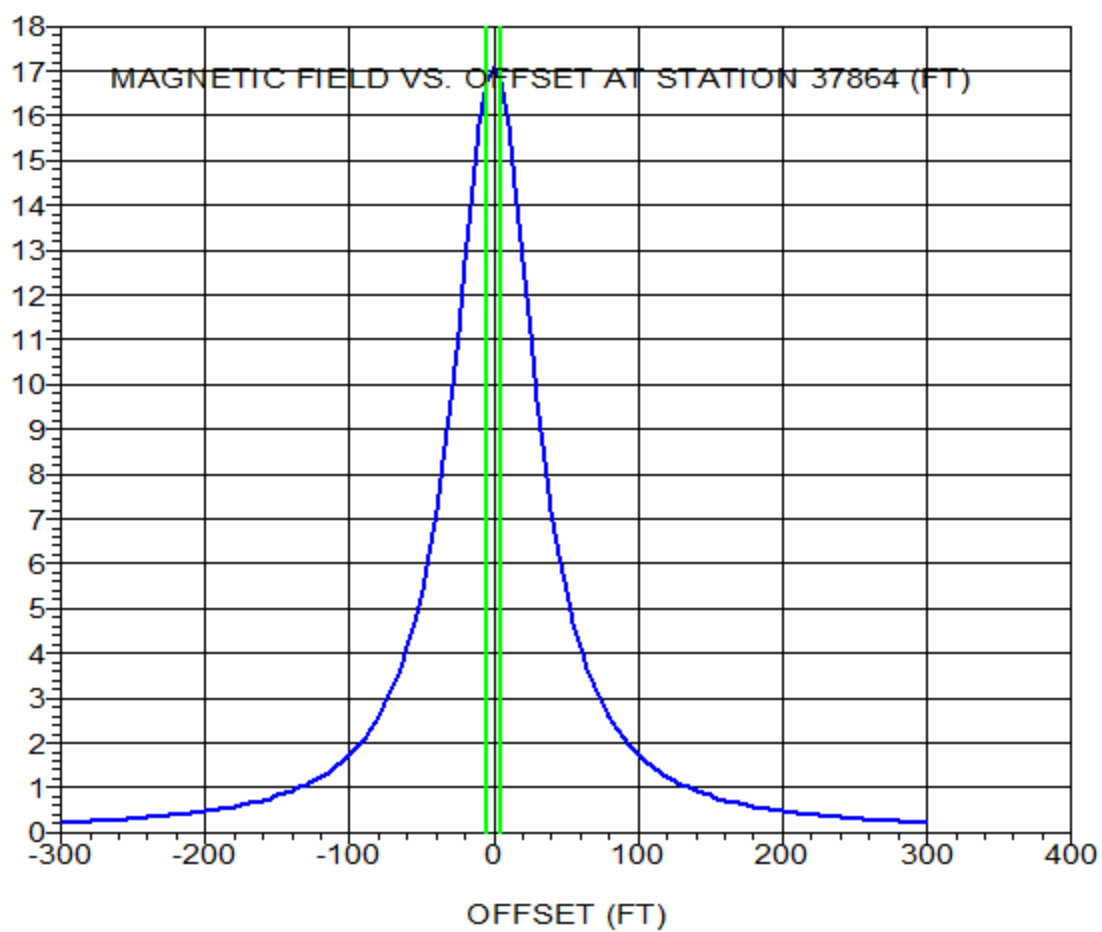
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

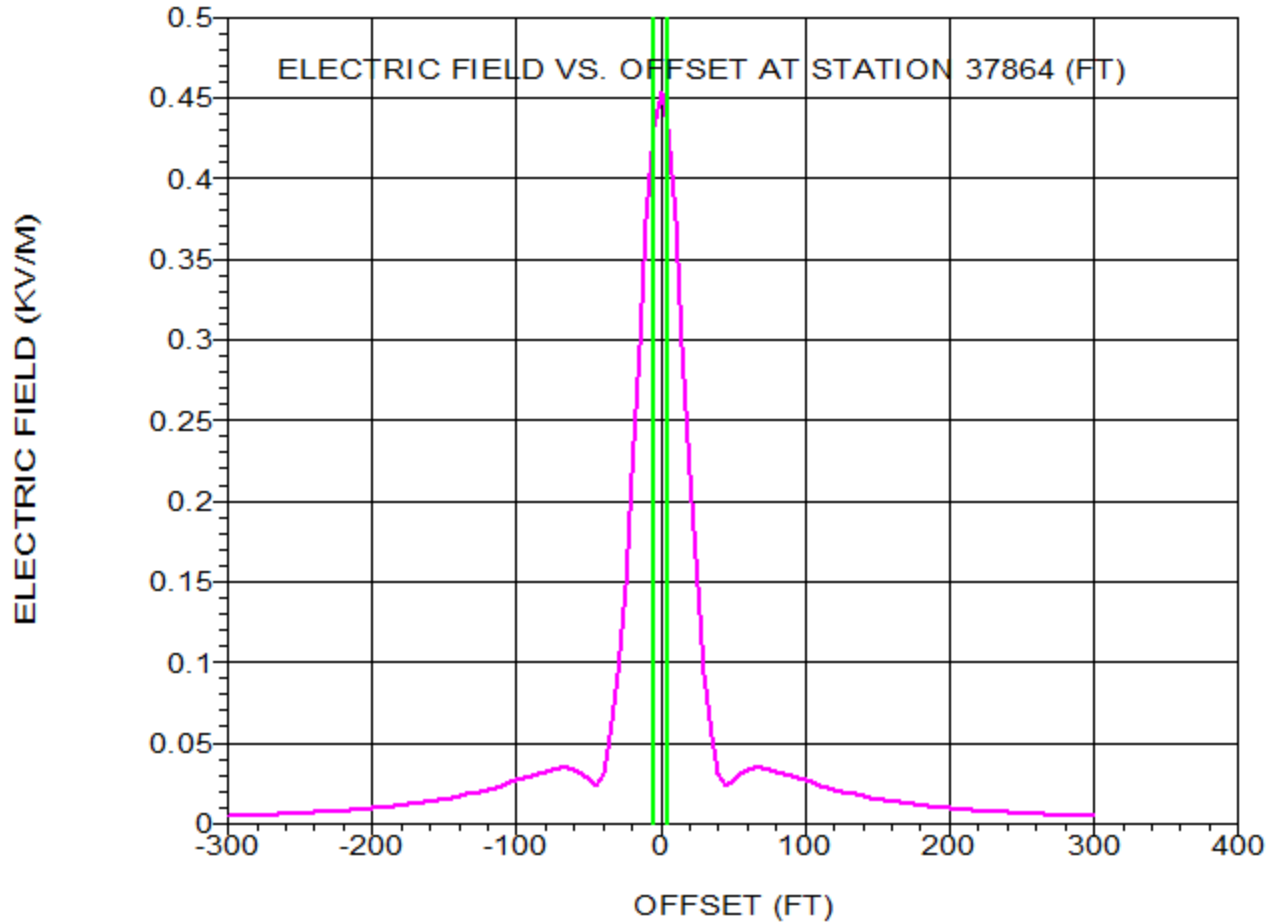
Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Wire Voltage To Gnd. (kV)
5	1	212° F Max Sag RS		Left	2158368.24	16961511.68	974.81	37864.36	4.60	0.858	19.92
5	2	212° F Max Sag RS		Left	2158368.24	16961511.68	967.81	37864.36	4.60	0.858	19.92
5	3	212° F Max Sag RS		Left	2158368.24	16961511.68	960.81	37864.36	4.60	0.858	19.92
6	1	212° F Max Sag RS		Left	2158359.04	16961511.65	974.80	37864.36	-4.60	0.858	19.92
6	2	212° F Max Sag RS		Left	2158359.04	16961511.65	967.80	37864.36	-4.60	0.858	19.92
6	3	212° F Max Sag RS		Left	2158359.04	16961511.65	960.80	37864.36	-4.60	0.858	19.92

Maximum magnetic field of 17.10 (mG) found at station 37864.36, offset 0.00 (ft)

Maximum electric field of 0.453 (kV/m) found at station 37864.36, offset 0.00 (ft)

MAGNETIC FIELD (MG)





EMF Calculation Results:

Station	Offset	X	Y	Z	B Real	B Img.	B B Phase Angle	B rms Res.	E Real	E Img.	E E Phase Angle	E Axis Angle	E rms
Res. (deg)	(ft)	(ft)	(ft)	(ft)	(mG)	(mG)	(deg)	(mG)	(kV/m)	(kV/m)	(deg)		(kV/m)
---	---	---	---	---	---	---	---	---	---	---	---	---	---
37864.36	-300.00	2158063.64	16961510.89	931.31	0.184	0.10683	30.1	0.213	0.004	0.00105	13.8	88.9	0.004
37864.36	-295.00	2158068.64	16961510.90	931.31	0.191	0.11045	30.1	0.220	0.004	0.00109	13.8	88.9	0.005
37864.36	-290.00	2158073.64	16961510.92	931.31	0.197	0.11425	30.1	0.228	0.005	0.00112	13.8	88.9	0.005
37864.36	-285.00	2158078.64	16961510.93	931.31	0.204	0.11826	30.1	0.236	0.005	0.00116	13.8	88.9	0.005
37864.36	-280.00	2158083.64	16961510.94	931.31	0.211	0.12247	30.1	0.244	0.005	0.00120	13.8	88.8	0.005
37864.36	-275.00	2158088.64	16961510.96	931.31	0.219	0.12692	30.1	0.253	0.005	0.00124	13.7	88.8	0.005
37864.36	-270.00	2158093.64	16961510.97	931.31	0.227	0.13160	30.1	0.262	0.005	0.00128	13.7	88.8	0.005
37864.36	-265.00	2158098.64	16961510.98	931.31	0.235	0.13656	30.1	0.272	0.005	0.00133	13.7	88.8	0.006
37864.36	-260.00	2158103.64	16961510.99	931.31	0.244	0.14179	30.1	0.283	0.006	0.00137	13.7	88.8	0.006
37864.36	-255.00	2158108.64	16961511.01	931.31	0.254	0.14734	30.1	0.294	0.006	0.00142	13.7	88.7	0.006
37864.36	-250.00	2158113.64	16961511.02	931.31	0.264	0.15321	30.1	0.305	0.006	0.00148	13.7	88.7	0.006
37864.36	-245.00	2158118.64	16961511.03	931.31	0.275	0.15944	30.1	0.318	0.006	0.00153	13.7	88.7	0.006
37864.36	-240.00	2158123.64	16961511.05	931.31	0.286	0.16605	30.1	0.331	0.007	0.00159	13.7	88.7	0.007
37864.36	-235.00	2158128.64	16961511.06	931.31	0.298	0.17309	30.1	0.345	0.007	0.00165	13.7	88.7	0.007
37864.36	-230.00	2158133.64	16961511.07	931.31	0.311	0.18057	30.2	0.359	0.007	0.00171	13.7	88.6	0.007
37864.36	-225.00	2158138.64	16961511.08	931.31	0.324	0.18855	30.2	0.375	0.007	0.00178	13.6	88.6	0.008
37864.36	-220.00	2158143.64	16961511.10	931.31	0.339	0.19707	30.2	0.392	0.008	0.00186	13.6	88.6	0.008
37864.36	-215.00	2158148.64	16961511.11	931.31	0.355	0.20618	30.2	0.410	0.008	0.00193	13.6	88.6	0.008
37864.36	-210.00	2158153.64	16961511.12	931.31	0.371	0.21592	30.2	0.429	0.008	0.00201	13.6	88.5	0.009
37864.36	-205.00	2158158.64	16961511.14	931.31	0.389	0.22637	30.2	0.450	0.009	0.00210	13.6	88.5	0.009
37864.36	-200.00	2158163.64	16961511.15	931.31	0.408	0.23759	30.2	0.472	0.009	0.00219	13.6	88.5	0.009
37864.36	-195.00	2158168.64	16961511.16	931.31	0.429	0.24966	30.2	0.496	0.010	0.00229	13.5	88.4	0.010
37864.36	-190.00	2158173.64	16961511.17	931.31	0.451	0.26267	30.2	0.522	0.010	0.00239	13.5	88.4	0.010
37864.36	-185.00	2158178.64	16961511.19	931.31	0.475	0.27671	30.2	0.550	0.010	0.00250	13.5	88.4	0.011
37864.36	-180.00	2158183.64	16961511.20	931.31	0.501	0.29189	30.2	0.579	0.011	0.00262	13.5	88.4	0.011
37864.36	-175.00	2158188.64	16961511.21	931.31	0.528	0.30835	30.3	0.612	0.011	0.00274	13.4	88.3	0.012

37864.36	-170.00	2158193.64	16961511.23	931.31	0.559	0.32623	30.3	0.647	0.012	0.00287	13.4	88.3	0.012
37864.36	-165.00	2158198.64	16961511.24	931.31	0.592	0.34569	30.3	0.685	0.013	0.00301	13.3	88.3	0.013
37864.36	-160.00	2158203.64	16961511.25	931.31	0.628	0.36692	30.3	0.727	0.013	0.00315	13.3	88.2	0.014
37864.36	-155.00	2158208.64	16961511.26	931.31	0.667	0.39015	30.3	0.773	0.014	0.00331	13.2	88.2	0.014
37864.36	-150.00	2158213.64	16961511.28	931.31	0.710	0.41562	30.4	0.822	0.015	0.00348	13.2	88.2	0.015
37864.36	-145.00	2158218.64	16961511.29	931.31	0.757	0.44364	30.4	0.877	0.016	0.00365	13.1	88.1	0.016
37864.36	-140.00	2158223.64	16961511.30	931.31	0.809	0.47454	30.4	0.938	0.017	0.00383	13.0	88.1	0.017
37864.36	-135.00	2158228.64	16961511.32	931.31	0.866	0.50873	30.4	1.004	0.017	0.00403	13.0	88.1	0.018
37864.36	-130.00	2158233.64	16961511.33	931.31	0.929	0.54669	30.5	1.078	0.019	0.00423	12.9	88.1	0.019
37864.36	-125.00	2158238.64	16961511.34	931.31	1.000	0.58897	30.5	1.161	0.020	0.00444	12.7	88.0	0.020
37864.36	-120.00	2158243.64	16961511.35	931.31	1.079	0.63625	30.5	1.252	0.021	0.00465	12.6	88.0	0.021
37864.36	-115.00	2158248.64	16961511.37	931.31	1.166	0.68932	30.6	1.355	0.022	0.00486	12.4	88.0	0.023
37864.36	-110.00	2158253.64	16961511.38	931.31	1.265	0.74915	30.6	1.470	0.023	0.00507	12.2	88.0	0.024
37864.36	-105.00	2158258.64	16961511.39	931.31	1.377	0.81689	30.7	1.601	0.025	0.00526	12.0	88.1	0.025
37864.36	-100.00	2158263.64	16961511.41	931.31	1.503	0.89396	30.8	1.748	0.026	0.00543	11.7	88.1	0.027
37864.36	-95.00	2158268.64	16961511.42	931.31	1.646	0.98208	30.8	1.917	0.028	0.00555	11.3	88.2	0.028
37864.36	-90.00	2158273.64	16961511.43	931.31	1.810	1.08337	30.9	2.109	0.029	0.00560	10.9	88.3	0.030
37864.36	-85.00	2158278.64	16961511.44	931.31	1.998	1.20047	31.0	2.331	0.031	0.00554	10.2	88.5	0.031
37864.36	-80.00	2158283.64	16961511.46	931.31	2.215	1.33665	31.1	2.587	0.032	0.00532	9.4	88.8	0.032
37864.36	-75.00	2158288.64	16961511.47	931.31	2.467	1.49602	31.2	2.885	0.033	0.00485	8.3	89.2	0.033
37864.36	-70.00	2158293.64	16961511.48	931.31	2.760	1.68372	31.4	3.233	0.034	0.00402	6.8	89.8	0.034
37864.36	-65.00	2158298.64	16961511.50	931.31	3.103	1.90625	31.6	3.642	0.034	0.00275	4.6	90.6	0.034
37864.36	-60.00	2158303.64	16961511.51	931.31	3.507	2.17180	31.8	4.125	0.033	0.00177	3.1	91.9	0.033
37864.36	-55.00	2158308.64	16961511.52	931.31	3.984	2.49062	32.0	4.699	0.030	0.00433	8.1	93.8	0.030
37864.36	-50.00	2158313.64	16961511.54	931.31	4.549	2.87540	32.3	5.381	0.025	0.00980	21.1	95.6	0.027
37864.36	-45.00	2158318.64	16961511.55	931.31	5.217	3.34138	32.6	6.196	0.018	0.01833	46.1	90.2	0.024
37864.36	-40.00	2158323.64	16961511.56	931.31	6.007	3.90589	33.0	7.165	0.011	0.03120	71.3	72.3	0.031
37864.36	-35.00	2158328.64	16961511.57	931.31	6.931	4.58637	33.5	8.311	0.023	0.05023	65.0	70.3	0.055
37864.36	-30.00	2158333.64	16961511.59	931.31	7.995	5.39546	34.0	9.645	0.052	0.07763	56.3	72.8	0.093
37864.36	-25.00	2158338.64	16961511.60	931.31	9.184	6.33100	34.6	11.155	0.091	0.11551	51.6	75.4	0.147
37864.36	-20.00	2158343.64	16961511.61	931.31	10.449	7.35981	35.2	12.781	0.141	0.16455	49.4	78.0	0.217
37864.36	-15.00	2158348.64	16961511.63	931.31	11.692	8.39947	35.7	14.397	0.197	0.22173	48.4	80.6	0.296
37864.36	-10.00	2158353.64	16961511.64	931.31	12.763	9.31412	36.1	15.800	0.250	0.27839	48.1	83.5	0.374
37864.36	-5.00	2158358.64	16961511.65	931.31	13.493	9.94526	36.4	16.762	0.289	0.32108	48.0	86.7	0.432
37864.36	0.00	2158363.64	16961511.66	931.31	13.752	10.17010	36.5	17.104	0.303	0.33705	48.0	90.0	0.453
37864.36	5.00	2158368.64	16961511.68	931.31	13.492	9.94438	36.4	16.761	0.289	0.32106	48.0	93.3	0.432
37864.36	10.00	2158373.64	16961511.69	931.31	12.761	9.31273	36.1	15.798	0.250	0.27837	48.1	96.5	0.374
37864.36	15.00	2158378.64	16961511.70	931.31	11.691	8.39799	35.7	14.394	0.197	0.22172	48.4	99.4	0.296
37864.36	20.00	2158383.64	16961511.72	931.31	10.448	7.35854	35.2	12.779	0.141	0.16455	49.4	102.0	0.217
37864.36	25.00	2158388.64	16961511.73	931.31	9.183	6.33001	34.6	11.153	0.091	0.11552	51.6	104.6	0.147
37864.36	30.00	2158393.64	16961511.74	931.31	7.994	5.39474	34.0	9.644	0.052	0.07764	56.3	107.2	0.093
37864.36	35.00	2158398.64	16961511.75	931.31	6.930	4.58586	33.5	8.310	0.023	0.05025	65.0	109.7	0.055
37864.36	40.00	2158403.64	16961511.77	931.31	6.006	3.90553	33.0	7.164	0.011	0.03122	71.3	107.7	0.031
37864.36	45.00	2158408.64	16961511.78	931.31	5.217	3.34113	32.6	6.195	0.018	0.01835	46.1	89.8	0.024
37864.36	50.00	2158413.64	16961511.79	931.31	4.549	2.87522	32.3	5.381	0.025	0.00981	21.2	84.4	0.027
37864.36	55.00	2158418.64	16961511.81	931.31	3.984	2.49049	32.0	4.698	0.030	0.00434	8.2	86.2	0.030
37864.36	60.00	2158423.64	16961511.82	931.31	3.507	2.17171	31.8	4.125	0.033	0.00177	3.1	88.1	0.033
37864.36	65.00	2158428.64	16961511.83	931.31	3.103	1.90618	31.6	3.642	0.034	0.00274	4.6	89.4	0.034
37864.36	70.00	2158433.64	16961511.84	931.31	2.760	1.68367	31.4	3.233	0.034	0.00401	6.8	90.2	0.034
37864.36	75.00	2158438.64	16961511.86	931.31	2.466	1.49598	31.2	2.885	0.033	0.00484	8.3	90.8	0.033
37864.36	80.00	2158443.64	16961511.87	931.31	2.215	1.33662	31.1	2.587	0.032	0.00531	9.4	91.2	0.032
37864.36	85.00	2158448.64	16961511.88	931.31	1.998	1.20045	31.0	2.331	0.031	0.00554	10.2	91.5	0.031
37864.36	90.00	2158453.64	16961511.90	931.31	1.810	1.08335	30.9	2.109	0.029	0.00560	10.9	91.7	0.030
37864.36	95.00	2158458.64	16961511.91	931.31	1.646	0.98206	30.8	1.917	0.028	0.00555	11.3	91.8	0.028
37864.36	100.00	2158463.64	16961511.92	931.31	1.503	0.89395	30.8	1.748	0.026	0.00542	11.7	91.9	0.027
37864.36	105.00	2158468.64	16961511.93	931.31	1.377	0.81688	30.7	1.601	0.025	0.00526	12.0	91.9	0.025
37864.36	110.00	2158473.64	16961511.95	931.31	1.265	0.74914	30.6	1.470	0.023	0.00506	12.2	92.0	0.024
37864.36	115.00	2158478.64	16961511.96	931.31	1.166	0.68932	30.6	1.355	0.022	0.00486	12.4	92.0	0.023
37864.36	120.00	2158483.64	16961511.97	931.31	1.079	0.63625	30.5	1.252	0.021	0.00465	12.6	92.0	0.021
37864.36	125.00	2158488.64	16961511.99	931.31	1.000	0.58897	30.5	1.161	0.020	0.00443	12.7	92.0	0.020
37864.36	130.00	2158493.64	16961512.00	931.31	0.929	0.54669	30.5	1.078	0.019	0.00423	12.9	91.9	0.019
37864.36	135.00	2158498.64	16961512.01	931.31	0.866	0.50873	30.4	1.004	0.017	0.00403	13.0	91.9	0.018
37864.36	140.00	2158503.64	16961512.02	931.31	0.809	0.47454	30.4	0.938	0.017	0.00383	13.0	91.9	0.017
37864.36	145.00	2158508.64	16961512.04	931.31	0.757	0.44364	30.4	0.877	0.016	0.00365	13.1	91.9	0.016
37864.36	150.00	2158513.64	16961512.05	931.31	0.710	0.41562	30.4	0.822	0.015	0.00348	13.2	91.8	0.015
37864.36	155.00	2158518.64	16961512.06	931.31	0.667	0.39015	30.3	0.773	0.014	0.00331	13.2	91.8	0.014
37864.36	160.00	2158523.64	16961512.08	931.31	0.628	0.36692	30.3	0.727	0.013	0.00315	13.3	91.8	0.014
37864.36	165.00	2158528.64	16961512.09	931.31	0.592	0.34569	30.3	0.685	0.013	0.00301	13.3	91.7	0.013
37864.36	170.00	2158533.64	16961512.10	931.31	0.559	0.32623	30.3	0.647	0.012	0.00287	13.4	91.7	0.012
37864.36	175.00	2158538.64	16961512.11	931.31	0.528	0.30835	30.3	0.612	0.011	0.00274	13.4	91.7	0.012
37864.36	180.00	2158543.64	16961512.13	931.31	0.501	0.29189	30.2	0.579	0.011	0.00261	13.5	91.6	0.011
37864.36	185.00	2158548.64	16961512.14	931.31	0.475	0.27671	30.2	0.550	0.010	0.00250	13.5	91.6	0.011
37864.36	190.00	2158553.64	16961512.15	931.31	0.451	0.26267	30.2	0.522	0.010	0.00239	13.5	91.6	0.010
37864.36	195.00	2158558.64	16961512.17	931.31	0.429	0.24966	30.2	0.496	0.010	0.00229	13.5	91.6	0.010
37864.36	200.00	2158563.64	16961512.18	931.31	0.408	0.23759	30.2	0.472	0.009	0.00219	13.6	91.5	0.009
37864.36	205.00	2158568.64	16961512.19	931.31	0.389	0.22637	30.2	0.450	0.009	0.00210	13.6	91.5	0.009
37864.36	210.00	2158573.64	16961512.20	931.31	0.371	0.21592	30.2	0.429	0.008	0.00201	13.6	91.5	

37864.36	235.00	2158598.64	16961512.27	931.31	0.298	0.17309	30.1	0.345	0.007	0.00165	13.7	91.3	0.007
37864.36	240.00	2158603.64	16961512.28	931.31	0.286	0.16605	30.1	0.331	0.007	0.00159	13.7	91.3	0.007
37864.36	245.00	2158608.64	16961512.29	931.31	0.275	0.15944	30.1	0.318	0.006	0.00153	13.7	91.3	0.006
37864.36	250.00	2158613.64	16961512.31	931.31	0.264	0.15321	30.1	0.305	0.006	0.00148	13.7	91.3	0.006
37864.36	255.00	2158618.64	16961512.32	931.31	0.254	0.14734	30.1	0.294	0.006	0.00142	13.7	91.3	0.006
37864.36	260.00	2158623.64	16961512.33	931.31	0.244	0.14179	30.1	0.283	0.006	0.00137	13.7	91.2	0.006
37864.36	265.00	2158628.64	16961512.35	931.31	0.235	0.13656	30.1	0.272	0.005	0.00133	13.7	91.2	0.006
37864.36	270.00	2158633.64	16961512.36	931.31	0.227	0.13160	30.1	0.262	0.005	0.00128	13.7	91.2	0.005
37864.36	275.00	2158638.64	16961512.37	931.31	0.219	0.12692	30.1	0.253	0.005	0.00124	13.7	91.2	0.005
37864.36	280.00	2158643.64	16961512.38	931.31	0.211	0.12247	30.1	0.244	0.005	0.00120	13.8	91.2	0.005
37864.36	285.00	2158648.64	16961512.40	931.31	0.204	0.11826	30.1	0.236	0.005	0.00116	13.8	91.1	0.005
37864.36	290.00	2158653.64	16961512.41	931.31	0.197	0.11425	30.1	0.228	0.005	0.00112	13.8	91.1	0.005
37864.36	295.00	2158658.64	16961512.42	931.31	0.191	0.11045	30.1	0.220	0.004	0.00109	13.8	91.1	0.005
37864.36	300.00	2158663.64	16961512.44	931.31	0.184	0.10683	30.1	0.213	0.004	0.00105	13.8	91.1	0.004

PLS-CADD Version 15.00x64 3:21:47 PM Monday, December 17, 2018
 Sargent & Lundy
 Project Name: 'g:\xcel\w3601_str30(w3315)-str199\w3601_str30(w3315)-str199.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

***** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly *****

***** User may prefer to add other specific load cases utilizing alternative Strength Factors *****

***** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER *****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
 Cross section offset for graph +/-: 300.00 (ft)
 Result interval for graph: 5.00 (ft)
 Electric field limit: 0.00 (kV/m)
 Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure W3315-30 to structure W3601-52

EMF Circuit Data:

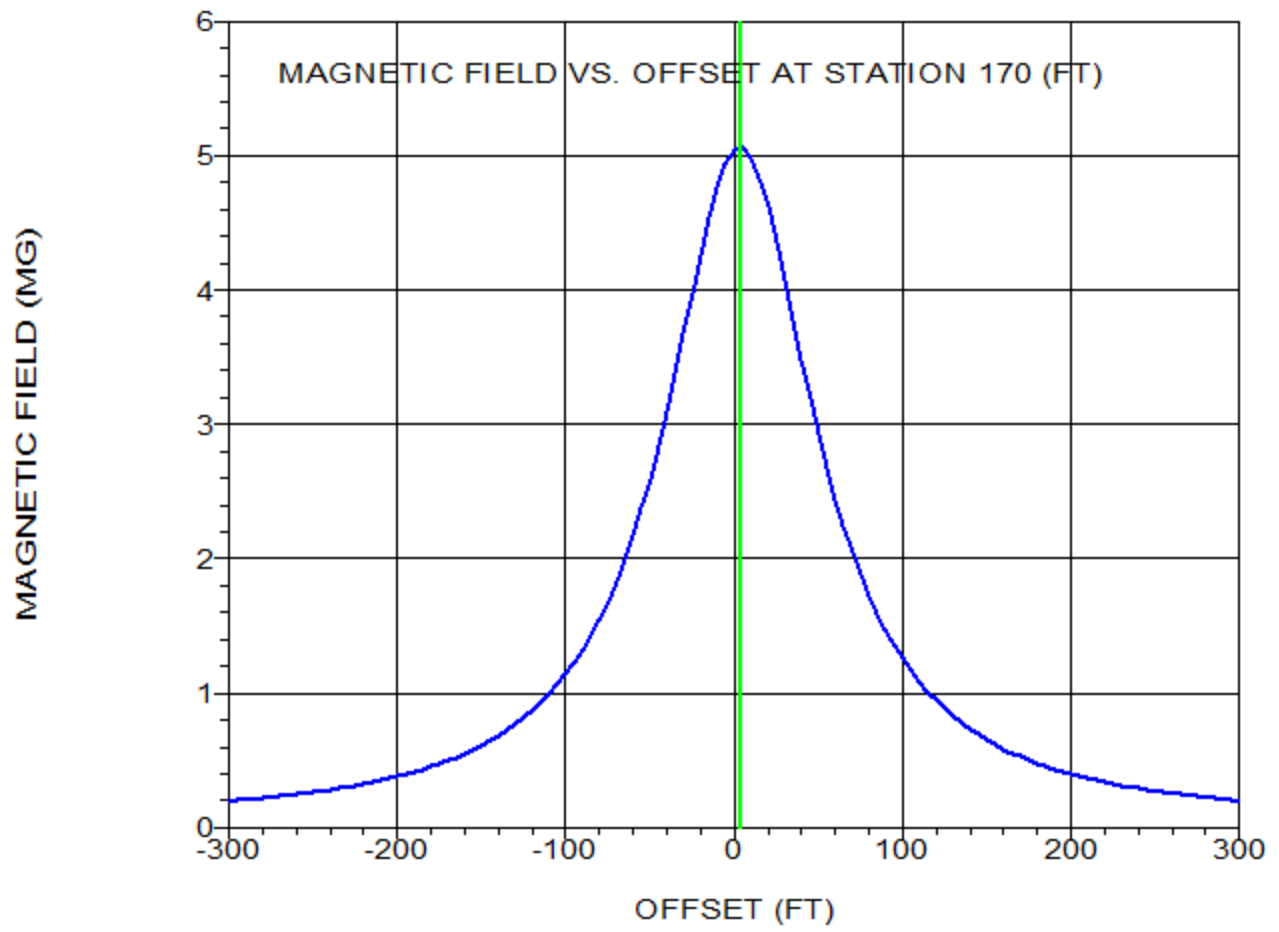
Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
5	1	1	34.5	122.000	0	0.858
5	2	1	34.5	122.000	120	0.858
5	3	1	34.5	122.000	-120	0.858

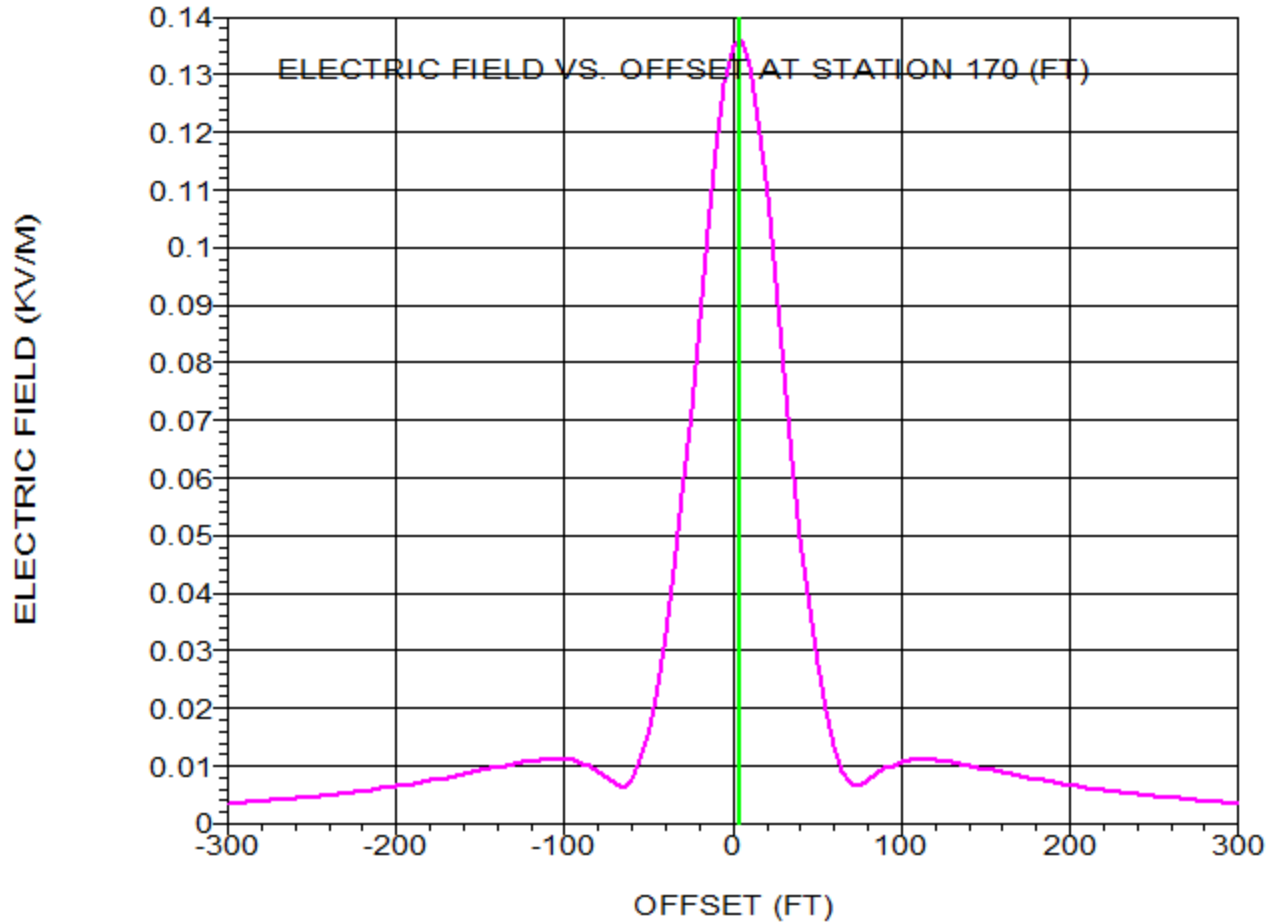
Calculated EMF Circuit Data For Last Point:

Wire station and offset are based on alignment closest to point on wire.
 In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Wire Eqv. Diameter (in)	Wire Voltage To Gnd. (kV)
5	1	212° F	Max Sag	RS	Left	2150777.69	16931340.34	707.24	169.58	3.39	0.858 19.92
5	2	212° F	Max Sag	RS	Left	2150777.70	16931340.33	696.23	169.57	3.40	0.858 19.92
5	3	212° F	Max Sag	RS	Left	2150777.79	16931340.31	684.74	169.57	3.49	0.858 19.92

Maximum magnetic field of 5.06 (mG) found at station 169.65, offset 5.00 (ft)
 Maximum electric field of 0.136 (kV/m) found at station 169.65, offset 5.00 (ft)





EMF Calculation Results:

Station	Offset	X	Y	Z	B	B	B	Phase	B	rms	E	E	E	Phase	E	Axis	E	rms
(ft)	(ft)	(ft)	(ft)	(ft)	Real	Img.	Angle	(deg)	Res.	Real	Real	Img.	Angle	(deg)	Angle	(deg)	Res.	(kv/m)
169.65	-300.00	2150485.41	16931421.68	636.15	0.165	0.10145	31.6	0.194	0.003	0.00102	17.3	89.0	0.003					
169.65	-295.00	2150490.23	16931420.34	636.15	0.170	0.10426	31.6	0.199	0.003	0.00105	17.3	89.0	0.004					
169.65	-290.00	2150495.04	16931419.00	636.15	0.175	0.10720	31.6	0.205	0.003	0.00108	17.3	89.0	0.004					
169.65	-285.00	2150499.86	16931417.66	636.15	0.180	0.11028	31.5	0.211	0.004	0.00111	17.3	89.0	0.004					
169.65	-280.00	2150504.68	16931416.33	636.15	0.185	0.11352	31.5	0.217	0.004	0.00114	17.3	89.0	0.004					
169.65	-275.00	2150509.49	16931414.99	636.15	0.191	0.11693	31.5	0.224	0.004	0.00117	17.3	89.0	0.004					
169.65	-270.00	2150514.31	16931413.65	636.15	0.196	0.12051	31.5	0.230	0.004	0.00121	17.3	88.9	0.004					
169.65	-265.00	2150519.13	16931412.31	636.15	0.203	0.12428	31.5	0.238	0.004	0.00125	17.3	88.9	0.004					
169.65	-260.00	2150523.95	16931410.97	636.15	0.209	0.12826	31.5	0.245	0.004	0.00129	17.2	88.9	0.004					
169.65	-255.00	2150528.76	16931409.63	636.15	0.216	0.13245	31.5	0.253	0.004	0.00132	17.2	88.9	0.004					
169.65	-250.00	2150533.58	16931408.29	636.15	0.223	0.13688	31.5	0.262	0.004	0.00137	17.2	88.9	0.005					
169.65	-245.00	2150538.40	16931406.95	636.15	0.231	0.14155	31.5	0.271	0.005	0.00141	17.2	88.9	0.005					
169.65	-240.00	2150543.21	16931405.61	636.15	0.239	0.14650	31.5	0.280	0.005	0.00145	17.2	88.9	0.005					
169.65	-235.00	2150548.03	16931404.27	636.15	0.247	0.15174	31.5	0.290	0.005	0.00150	17.1	88.9	0.005					
169.65	-230.00	2150552.85	16931402.93	636.15	0.256	0.15730	31.5	0.301	0.005	0.00155	17.1	88.8	0.005					
169.65	-225.00	2150557.67	16931401.59	636.15	0.266	0.16320	31.5	0.312	0.005	0.00160	17.1	88.8	0.005					
169.65	-220.00	2150562.48	16931400.25	636.15	0.276	0.16947	31.5	0.324	0.005	0.00165	17.0	88.8	0.006					
169.65	-215.00	2150567.30	16931398.91	636.15	0.287	0.17613	31.6	0.337	0.006	0.00171	17.0	88.8	0.006					
169.65	-210.00	2150572.12	16931397.57	636.15	0.298	0.18324	31.6	0.350	0.006	0.00176	17.0	88.8	0.006					
169.65	-205.00	2150576.94	16931396.23	636.15	0.311	0.19082	31.6	0.365	0.006	0.00182	16.9	88.8	0.006					
169.65	-200.00	2150581.75	16931394.89	636.15	0.324	0.19891	31.6	0.380	0.006	0.00188	16.9	88.8	0.006					
169.65	-195.00	2150586.57	16931393.55	636.15	0.338	0.20757	31.6	0.396	0.006	0.00194	16.8	88.8	0.007					
169.65	-190.00	2150591.39	16931392.21	636.15	0.352	0.21685	31.6	0.414	0.007	0.00201	16.8	88.8	0.007					
169.65	-185.00	2150596.20	16931390.88	636.15	0.368	0.22679	31.6	0.433	0.007	0.00207	16.7	88.8	0.007					
169.65	-180.00	2150601.02	16931389.54	636.15	0.386	0.23748	31.6	0.453	0.007	0.00214	16.6	88.8	0.007					
169.65	-175.00	2150605.84	16931388.20	636.15	0.404	0.24899	31.7	0.474	0.007	0.00221	16.6	88.8	0.008					
169.65	-170.00	2150610.66	16931386.86	636.15	0.424	0.26139	31.7	0.498	0.008	0.00227	16.5	88.8	0.008					
169.65	-165.00	2150615.47	16931385.52	636.15	0.445	0.27478	31.7	0.523	0.008	0.00234	16.4	88.8	0.008					
169.65	-160.00	2150620.29	16931384.18	636.15	0.468	0.28926	31.7	0.550	0.008	0.00241	16.2	88.8	0.009					

169.65	-155.00	2150625.11	16931382.84	636.15	0.493	0.30496	31.8	0.579	0.009	0.00247	16.1	88.8	0.009
169.65	-150.00	2150629.93	16931381.50	636.15	0.519	0.32200	31.8	0.611	0.009	0.00253	15.9	88.9	0.009
169.65	-145.00	2150634.74	16931380.16	636.15	0.549	0.34055	31.8	0.646	0.009	0.00258	15.8	88.9	0.010
169.65	-140.00	2150639.56	16931378.82	636.15	0.580	0.36076	31.9	0.683	0.009	0.00263	15.5	89.0	0.010
169.65	-135.00	2150644.38	16931377.48	636.15	0.615	0.38284	31.9	0.724	0.010	0.00266	15.3	89.0	0.010
169.65	-130.00	2150649.19	16931376.14	636.15	0.652	0.40702	32.0	0.769	0.010	0.00268	15.0	89.1	0.010
169.65	-125.00	2150654.01	16931374.80	636.15	0.693	0.43354	32.0	0.817	0.010	0.00268	14.6	89.2	0.011
169.65	-120.00	2150658.83	16931373.46	636.15	0.738	0.46272	32.1	0.871	0.011	0.00266	14.1	89.4	0.011
169.65	-115.00	2150663.65	16931372.12	636.15	0.787	0.49487	32.2	0.929	0.011	0.00259	13.6	89.5	0.011
169.65	-110.00	2150668.46	16931370.78	636.15	0.840	0.53040	32.3	0.994	0.011	0.00249	12.9	89.8	0.011
169.65	-105.00	2150673.28	16931369.44	636.15	0.900	0.56975	32.3	1.065	0.011	0.00232	12.0	90.1	0.011
169.65	-100.00	2150678.10	16931368.10	636.15	0.965	0.61342	32.4	1.143	0.011	0.00208	10.8	90.4	0.011
169.65	-95.00	2150682.92	16931366.77	636.15	1.037	0.66202	32.6	1.230	0.011	0.00175	9.2	90.9	0.011
169.65	-90.00	2150687.73	16931365.43	636.15	1.116	0.71620	32.7	1.326	0.010	0.00130	7.1	91.6	0.011
169.65	-85.00	2150692.55	16931364.09	636.15	1.204	0.77674	32.8	1.433	0.010	0.00077	4.4	92.5	0.010
169.65	-80.00	2150697.37	16931362.75	636.15	1.301	0.84450	33.0	1.551	0.009	0.00063	4.0	93.7	0.009
169.65	-75.00	2150702.18	16931361.41	636.15	1.409	0.92045	33.2	1.683	0.008	0.00155	11.0	95.0	0.008
169.65	-70.00	2150707.00	16931360.07	636.15	1.529	1.00567	33.3	1.830	0.006	0.00299	25.0	95.4	0.007
169.65	-65.00	2150711.82	16931358.73	636.15	1.660	1.10132	33.6	1.993	0.004	0.00490	48.2	90.0	0.006
169.65	-60.00	2150716.64	16931357.39	636.15	1.806	1.20858	33.8	2.173	0.002	0.00738	72.5	78.8	0.007
169.65	-55.00	2150721.45	16931356.05	636.15	1.966	1.32863	34.0	2.373	0.003	0.01057	71.8	75.5	0.011
169.65	-50.00	2150726.27	16931354.71	636.15	2.142	1.46251	34.3	2.594	0.008	0.01462	62.2	76.5	0.016
169.65	-45.00	2150731.09	16931353.37	636.15	2.333	1.61088	34.6	2.835	0.013	0.01971	55.8	78.0	0.024
169.65	-40.00	2150735.90	16931352.03	636.15	2.538	1.77379	35.0	3.096	0.020	0.02599	52.0	79.4	0.033
169.65	-35.00	2150740.72	16931350.69	636.15	2.755	1.95023	35.3	3.376	0.029	0.03360	49.6	80.5	0.044
169.65	-30.00	2150745.54	16931349.35	636.15	2.981	2.13762	35.6	3.668	0.038	0.04256	48.1	81.6	0.057
169.65	-25.00	2150750.36	16931348.01	636.15	3.210	2.33121	36.0	3.967	0.049	0.05275	47.3	82.7	0.072
169.65	-20.00	2150755.17	16931346.67	636.15	3.432	2.52356	36.3	4.260	0.060	0.06378	46.9	83.8	0.087
169.65	-15.00	2150759.99	16931345.33	636.15	3.638	2.70435	36.6	4.533	0.071	0.07495	46.7	84.9	0.103
169.65	-10.00	2150764.81	16931343.99	636.15	3.813	2.86085	36.9	4.767	0.080	0.08523	46.7	86.2	0.117
169.65	-5.00	2150769.63	16931342.65	636.15	3.944	2.97945	37.1	4.943	0.088	0.09342	46.7	87.6	0.128
169.65	-0.00	2150774.44	16931341.32	636.15	4.019	3.04805	37.2	5.044	0.092	0.09835	46.8	89.0	0.135
169.65	5.00	2150779.26	16931339.98	636.15	4.031	3.05889	37.2	5.060	0.093	0.09926	46.8	90.4	0.136
169.65	10.00	2150784.08	16931338.64	636.15	3.979	3.01068	37.1	4.989	0.090	0.09599	46.8	91.9	0.132
169.65	15.00	2150788.89	16931337.30	636.15	3.867	2.90890	37.0	4.839	0.084	0.08909	46.8	93.2	0.122
169.65	20.00	2150793.71	16931335.96	636.15	3.706	2.76435	36.7	4.623	0.075	0.07959	46.8	94.5	0.109
169.65	25.00	2150798.53	16931334.62	636.15	3.510	2.59041	36.4	4.362	0.064	0.06871	47.0	95.7	0.094
169.65	30.00	2150803.35	16931333.28	636.15	3.292	2.40042	36.1	4.074	0.053	0.05758	47.4	96.8	0.078
169.65	35.00	2150808.16	16931331.94	636.15	3.063	2.20572	35.8	3.775	0.042	0.04702	48.1	97.9	0.063
169.65	40.00	2150812.98	16931330.60	636.15	2.835	2.01485	35.4	3.478	0.032	0.03755	49.3	98.9	0.050
169.65	45.00	2150817.80	16931329.26	636.15	2.613	1.83353	35.1	3.192	0.024	0.02939	51.3	100.0	0.038
169.65	50.00	2150822.62	16931327.92	636.15	2.403	1.66509	34.7	2.923	0.016	0.02257	54.6	101.2	0.028
169.65	55.00	2150827.43	16931326.58	636.15	2.206	1.51103	34.4	2.674	0.010	0.01701	59.9	102.6	0.020
169.65	60.00	2150832.25	16931325.24	636.15	2.025	1.37166	34.1	2.445	0.005	0.01254	68.2	103.8	0.013
169.65	65.00	2150837.07	16931323.90	636.15	1.858	1.24647	33.9	2.238	0.002	0.00899	76.5	103.0	0.009
169.65	70.00	2150841.88	16931322.56	636.15	1.707	1.13454	33.6	2.050	0.003	0.00622	61.3	95.5	0.007
169.65	75.00	2150846.70	16931321.22	636.15	1.570	1.03471	33.4	1.880	0.006	0.00406	36.3	86.7	0.007
169.65	80.00	2150851.52	16931319.88	636.15	1.446	0.94577	33.2	1.728	0.007	0.00240	18.3	85.0	0.008
169.65	85.00	2150856.34	16931318.54	636.15	1.334	0.86656	33.0	1.591	0.009	0.00118	7.8	86.0	0.009
169.65	90.00	2150861.15	16931317.20	636.15	1.233	0.79594	32.8	1.468	0.010	0.00051	3.1	87.1	0.010
169.65	95.00	2150865.97	16931315.87	636.15	1.142	0.73290	32.7	1.357	0.010	0.00084	4.7	88.1	0.010
169.65	100.00	2150870.79	16931314.53	636.15	1.059	0.67655	32.6	1.257	0.011	0.00133	7.2	88.8	0.011
169.65	105.00	2150875.60	16931313.19	636.15	0.985	0.62606	32.4	1.167	0.011	0.00172	9.1	89.4	0.011
169.65	110.00	2150880.42	16931311.85	636.15	0.917	0.58074	32.3	1.086	0.011	0.00201	10.5	89.8	0.011
169.65	115.00	2150885.24	16931310.51	636.15	0.856	0.53996	32.2	1.012	0.011	0.00221	11.6	90.1	0.011
169.65	120.00	2150890.06	16931309.17	636.15	0.800	0.50318	32.2	0.945	0.011	0.00236	12.4	90.4	0.011
169.65	125.00	2150894.87	16931307.83	636.15	0.750	0.46993	32.1	0.885	0.010	0.00245	13.1	90.6	0.011
169.65	130.00	2150899.69	16931306.49	636.15	0.704	0.43980	32.0	0.830	0.010	0.00250	13.7	90.7	0.011
169.65	135.00	2150904.51	16931305.15	636.15	0.662	0.41243	31.9	0.780	0.010	0.00252	14.1	90.8	0.010
169.65	140.00	2150909.33	16931303.81	636.15	0.623	0.38752	31.9	0.734	0.010	0.00252	14.5	90.9	0.010
169.65	145.00	2150914.14	16931302.47	636.15	0.588	0.36479	31.8	0.692	0.009	0.00249	14.8	91.0	0.010
169.65	150.00	2150918.96	16931301.13	636.15	0.555	0.34401	31.8	0.653	0.009	0.00246	15.0	91.1	0.009
169.65	155.00	2150923.78	16931299.79	636.15	0.525	0.32497	31.7	0.618	0.009	0.00242	15.3	91.1	0.009
169.65	160.00	2150928.59	16931298.45	636.15	0.498	0.30749	31.7	0.585	0.009	0.00237	15.4	91.2	0.009
169.65	165.00	2150933.41	16931297.11	636.15	0.472	0.29140	31.7	0.555	0.008	0.00231	15.6	91.2	0.009
169.65	170.00	2150938.23	16931295.77	636.15	0.449	0.27657	31.6	0.527	0.008	0.00225	15.7	91.2	0.008
169.65	175.00	2150943.05	16931294.43	636.15	0.427	0.26287	31.6	0.501	0.008	0.00219	15.9	91.2	0.008
169.65	180.00	2150947.86	16931293.09	636.15	0.407	0.25020	31.6	0.478	0.007	0.00213	16.0	91.2	0.008
169.65	185.00	2150952.68	16931291.76	636.15	0.388	0.23846	31.6	0.455	0.007	0.00206	16.1	91.2	0.007
169.65	190.00	2150957.50	16931290.42	636.15	0.371	0.22755	31.5	0.435	0.007	0.00200	16.2	91.2	0.007
169.65	195.00	2150962.32	16931289.08	636.15	0.354	0.21741	31.5	0.416	0.007	0.00194	16.2	91.2	0.007
169.65	200.00	2150967.13	16931287.74	636.15	0.339	0.20797	31.5	0.398	0.006	0.00188	16.3	91.2	0.007
169.65	205.00	2150971.95	16931286.40	636.15	0.325	0.19916	31.5	0.381	0.006	0.00182	16.4	91.2	0.006
169.65	210.00	2150976.77	16931285.06	636.15	0.312	0.19093	31.5	0.366	0.006	0.00176	16.4	91.2	0.006
169.65	215.00	2150981.58	16931283.72	636.15	0.299	0.18324	31.5	0.351	0.006	0.00171	16.5	91.2	0.006
169.65	220.00	2150986.40	16931282.38	636.15	0.288	0.17603	31.5	0.337	0.006	0.00165	16.5	91.2	0.006
169.65	225.00	2150991.22	16931281.04	636.15	0.277	0.16926	31.5	0.324	0.005	0.00160	16.5	91.2	0.006
169.65	230.00	2150996.04	16931279.70	636.15	0.266	0.16291	31.5	0.312	0.005	0.00155	16.6	91.2	0.005

169.65	250.00	2151015.30	16931274.34	636.15	0.231	0.14101	31.4	0.270	0.005	0.00136	16.7	91.1	0.005
169.65	255.00	2151020.12	16931273.00	636.15	0.223	0.13629	31.4	0.261	0.004	0.00132	16.7	91.1	0.005
169.65	260.00	2151024.94	16931271.66	636.15	0.216	0.13182	31.4	0.253	0.004	0.00128	16.7	91.1	0.004
169.65	265.00	2151029.76	16931270.32	636.15	0.209	0.12760	31.4	0.245	0.004	0.00124	16.8	91.1	0.004
169.65	270.00	2151034.57	16931268.98	636.15	0.202	0.12359	31.4	0.237	0.004	0.00120	16.8	91.1	0.004
169.65	275.00	2151039.39	16931267.64	636.15	0.196	0.11979	31.4	0.230	0.004	0.00117	16.8	91.1	0.004
169.65	280.00	2151044.21	16931266.31	636.15	0.190	0.11618	31.4	0.223	0.004	0.00113	16.8	91.1	0.004
169.65	285.00	2151049.03	16931264.97	636.15	0.184	0.11276	31.4	0.216	0.004	0.00110	16.8	91.0	0.004
169.65	290.00	2151053.84	16931263.63	636.15	0.179	0.10950	31.4	0.210	0.004	0.00107	16.8	91.0	0.004
169.65	295.00	2151058.66	16931262.29	636.15	0.174	0.10640	31.4	0.204	0.003	0.00104	16.9	91.0	0.004
169.65	300.00	2151063.48	16931260.95	636.15	0.169	0.10344	31.4	0.198	0.003	0.00101	16.9	91.0	0.003

PLS-CADD Version 15.00x64 3:56:30 PM Monday, December 17, 2018
 Sargent & Lundy
 Project Name: 'g:\xcel\w3603_str199(w3601)-byf_tp\w3606_str199(w3601)-byf_tp.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

***** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly *****

***** User may prefer to add other specific load cases utilizing alternative Strength Factors *****

***** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER *****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
 Cross section offset for graph +/-: 300.00 (ft)
 Result interval for graph: 5.00 (ft)
 Electric field limit: 0.00 (kV/m)
 Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure W3603-72 to structure W3603-73

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
5	1	1	34.5	148.000	0	0.858
5	2	1	34.5	148.000	120	0.858
5	3	1	34.5	148.000	-120	0.858
6	1	1	34.5	148.000	0	0.858
6	2	1	34.5	148.000	120	0.858
6	3	1	34.5	148.000	-120	0.858

Calculated EMF Circuit Data For Last Point:

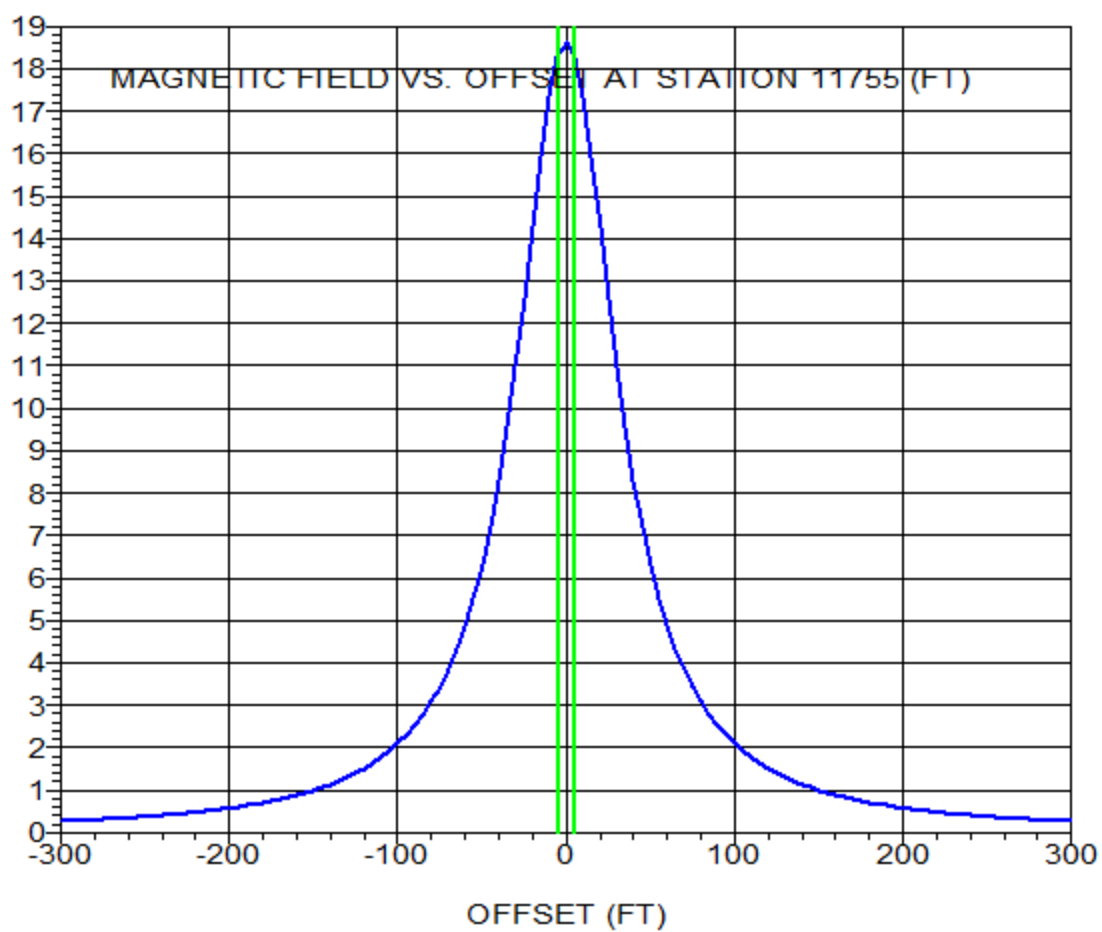
Wire station and offset are based on alignment closest to point on wire.

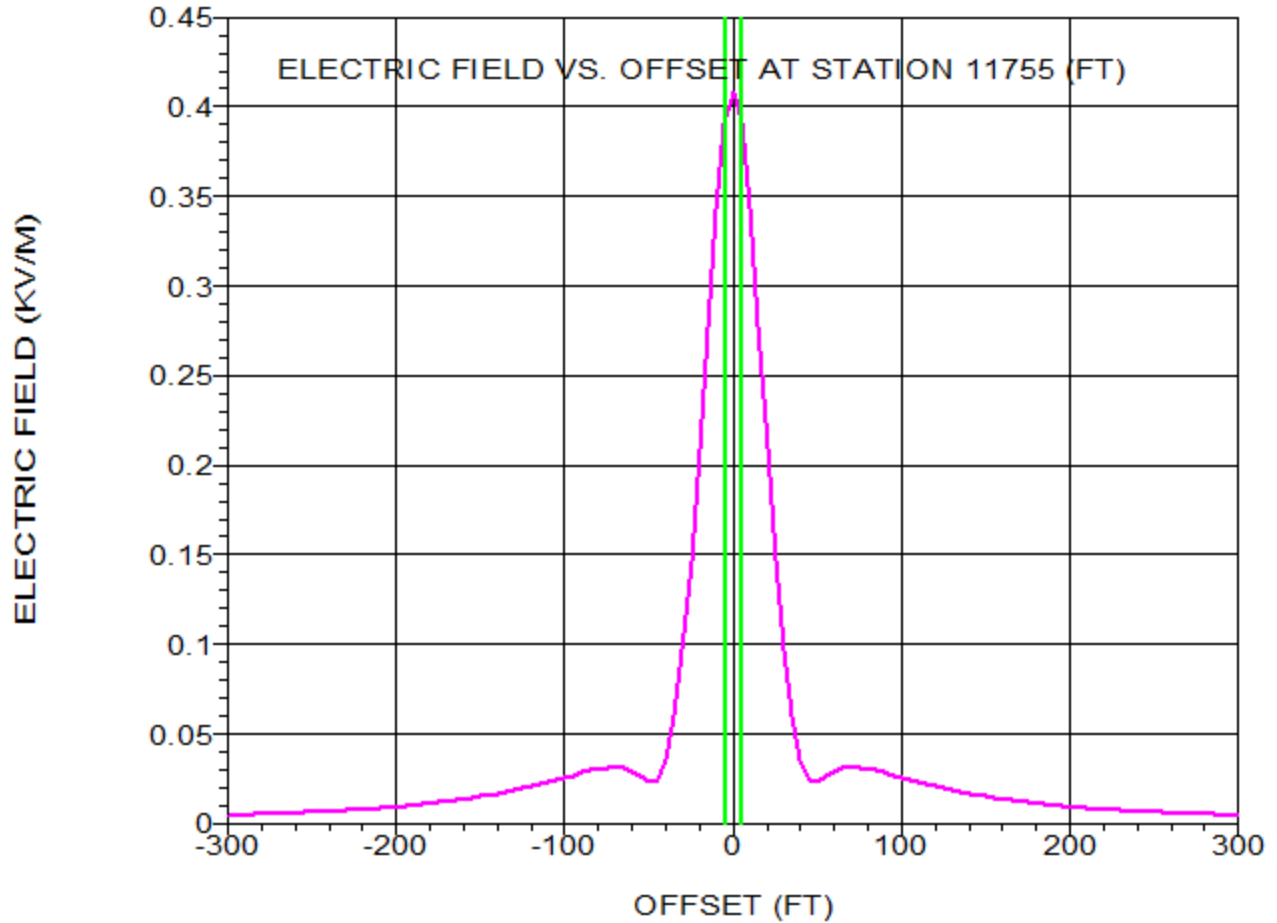
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Wire Voltage To Gnd. (kV)
5	1	212° F	Max Sag RS	Left	2165832.35	16978350.78	834.70	11754.48	4.63	0.858	19.92
5	2	212° F	Max Sag RS	Left	2165832.35	16978350.78	827.70	11754.48	4.63	0.858	19.92
5	3	212° F	Max Sag RS	Left	2165832.35	16978350.78	820.70	11754.48	4.63	0.858	19.92
6	1	212° F	Max Sag RS	Left	2165823.15	16978350.56	834.68	11754.48	-4.57	0.858	19.92
6	2	212° F	Max Sag RS	Left	2165823.15	16978350.56	827.68	11754.48	-4.57	0.858	19.92
6	3	212° F	Max Sag RS	Left	2165823.15	16978350.56	820.68	11754.48	-4.57	0.858	19.92

Maximum magnetic field of 18.62 (mG) found at station 11754.48, offset 0.00 (ft)
 Maximum electric field of 0.409 (kV/m) found at station 11754.48, offset 0.00 (ft)

MAGNETIC FIELD (MG)





EMF Calculation Results:

Station	Offset	X	Y	Z	B	B	B Phase	B rms	E	E E Phase	E Axis E rms
Res.					Real	Img.	Angle	Res.	Real	Img.	Angle
(deg)	(ft)	(ft)	(ft)	(ft)	(mG)	(mG)	(deg)	(mG)	(kV/m)	(kV/m)	(deg)
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11754.53	-300.00	2165527.80	16978343.73	789.30	0.223	0.12941	30.1	0.258	0.004	0.00102	13.3
11754.53	-295.00	2165532.80	16978343.85	789.30	0.231	0.13378	30.1	0.267	0.004	0.00105	13.3
11754.53	-290.00	2165537.80	16978343.97	789.30	0.239	0.13838	30.1	0.276	0.005	0.00108	13.3
11754.53	-285.00	2165542.79	16978344.08	789.30	0.247	0.14322	30.1	0.286	0.005	0.00112	13.3
11754.53	-280.00	2165547.79	16978344.20	789.30	0.256	0.14832	30.1	0.296	0.005	0.00115	13.2
11754.53	-275.00	2165552.79	16978344.31	789.30	0.265	0.15369	30.1	0.306	0.005	0.00119	13.2
11754.53	-270.00	2165557.79	16978344.43	789.30	0.275	0.15936	30.1	0.318	0.005	0.00123	13.2
11754.52	-265.00	2165562.79	16978344.54	789.30	0.285	0.16535	30.1	0.329	0.005	0.00128	13.2
11754.52	-260.00	2165567.79	16978344.66	789.30	0.296	0.17168	30.1	0.342	0.006	0.00132	13.2
11754.52	-255.00	2165572.79	16978344.77	789.30	0.307	0.17838	30.1	0.355	0.006	0.00137	13.2
11754.52	-250.00	2165577.78	16978344.89	789.30	0.319	0.18547	30.1	0.369	0.006	0.00142	13.2
11754.52	-245.00	2165582.78	16978345.01	789.30	0.332	0.19300	30.1	0.384	0.006	0.00147	13.2
11754.52	-240.00	2165587.78	16978345.12	789.30	0.346	0.20099	30.1	0.400	0.007	0.00152	13.2
11754.52	-235.00	2165592.78	16978345.24	789.30	0.361	0.20948	30.2	0.417	0.007	0.00158	13.1
11754.52	-230.00	2165597.78	16978345.35	789.30	0.376	0.21852	30.2	0.435	0.007	0.00164	13.1
11754.52	-225.00	2165602.78	16978345.47	789.30	0.393	0.22816	30.2	0.454	0.007	0.00171	13.1
11754.52	-220.00	2165607.78	16978345.58	789.30	0.410	0.23844	30.2	0.474	0.008	0.00177	13.1
11754.52	-215.00	2165612.78	16978345.70	789.30	0.429	0.24943	30.2	0.496	0.008	0.00185	13.1
11754.52	-210.00	2165617.77	16978345.81	789.30	0.449	0.26118	30.2	0.519	0.008	0.00192	13.0
11754.52	-205.00	2165622.77	16978345.93	789.30	0.470	0.27379	30.2	0.544	0.009	0.00200	13.0
11754.51	-200.00	2165627.77	16978346.05	789.30	0.493	0.28732	30.2	0.571	0.009	0.00209	13.0
11754.51	-195.00	2165632.77	16978346.16	789.30	0.518	0.30187	30.2	0.600	0.009	0.00218	13.0
11754.51	-190.00	2165637.77	16978346.28	789.30	0.545	0.31754	30.2	0.631	0.010	0.00227	12.9
11754.51	-185.00	2165642.77	16978346.39	789.30	0.574	0.33445	30.2	0.664	0.010	0.00237	12.9
11754.51	-180.00	2165647.77	16978346.51	789.30	0.605	0.35274	30.3	0.700	0.011	0.00248	12.8
11754.51	-175.00	2165652.76	16978346.62	789.30	0.638	0.37255	30.3	0.739	0.011	0.00259	12.8

11754.51	-170.00	2165657.76	16978346.74	789.30	0.675	0.39406	30.3	0.781	0.012	0.00271	12.8	88.3	0.012
11754.51	-165.00	2165662.76	16978346.85	789.30	0.714	0.41747	30.3	0.827	0.013	0.00283	12.7	88.3	0.013
11754.51	-160.00	2165667.76	16978346.97	789.30	0.757	0.44299	30.3	0.877	0.013	0.00296	12.6	88.3	0.014
11754.51	-155.00	2165672.76	16978347.09	789.30	0.804	0.47090	30.3	0.932	0.014	0.00310	12.6	88.2	0.014
11754.51	-150.00	2165677.76	16978347.20	789.30	0.856	0.50148	30.4	0.992	0.015	0.00325	12.5	88.2	0.015
11754.51	-145.00	2165682.76	16978347.32	789.30	0.912	0.53510	30.4	1.058	0.015	0.00340	12.4	88.2	0.016
11754.51	-140.00	2165687.76	16978347.43	789.30	0.974	0.57215	30.4	1.130	0.016	0.00356	12.3	88.2	0.017
11754.50	-135.00	2165692.75	16978347.55	789.30	1.043	0.61311	30.4	1.210	0.017	0.00372	12.2	88.1	0.018
11754.50	-130.00	2165697.75	16978347.66	789.30	1.119	0.65855	30.5	1.298	0.018	0.00388	12.1	88.1	0.019
11754.50	-125.00	2165702.75	16978347.78	789.30	1.203	0.70911	30.5	1.396	0.019	0.00405	11.9	88.1	0.020
11754.50	-120.00	2165707.75	16978347.90	789.30	1.297	0.76558	30.6	1.506	0.020	0.00422	11.7	88.1	0.021
11754.50	-115.00	2165712.75	16978348.01	789.30	1.401	0.82890	30.6	1.628	0.021	0.00437	11.5	88.1	0.022
11754.50	-110.00	2165717.75	16978348.13	789.30	1.519	0.90017	30.7	1.765	0.023	0.00451	11.2	88.1	0.023
11754.50	-105.00	2165722.73	16978348.24	789.30	1.651	0.98074	30.7	1.920	0.024	0.00463	10.9	88.2	0.024
11754.50	-100.00	2165727.74	16978348.36	789.30	1.800	1.07224	30.8	2.095	0.025	0.00471	10.5	88.3	0.026
11754.50	-95.00	2165732.74	16978348.47	789.30	1.970	1.17665	30.9	2.294	0.027	0.00472	10.0	88.4	0.027
11754.50	-90.00	2165737.73	16978348.59	789.30	2.163	1.29639	30.9	2.522	0.028	0.00464	9.4	88.5	0.028
11754.50	-85.00	2165742.74	16978348.70	789.30	2.384	1.43444	31.0	2.782	0.029	0.00442	8.6	88.7	0.030
11754.50	-80.00	2165747.74	16978348.82	789.30	2.638	1.59449	31.1	3.083	0.030	0.00401	7.6	89.1	0.030
11754.50	-75.00	2165752.74	16978348.94	789.30	2.932	1.78110	31.3	3.431	0.031	0.00332	6.1	89.5	0.031
11754.49	-70.00	2165757.74	16978349.05	789.30	3.273	1.99996	31.4	3.836	0.031	0.00230	4.2	90.2	0.031
11754.49	-65.00	2165762.74	16978349.17	789.30	3.670	2.25812	31.6	4.309	0.031	0.00138	2.6	91.1	0.031
11754.49	-60.00	2165767.73	16978349.28	789.30	4.135	2.56435	31.8	4.866	0.029	0.00310	6.0	92.5	0.029
11754.49	-55.00	2165772.73	16978349.40	789.30	4.680	2.92940	32.0	5.521	0.026	0.00706	15.1	94.1	0.027
11754.49	-50.00	2165777.73	16978349.51	789.30	5.319	3.36621	32.3	6.295	0.021	0.01315	32.4	93.8	0.024
11754.49	-45.00	2165782.73	16978349.63	789.30	6.069	3.88979	32.7	7.209	0.013	0.02216	59.5	83.0	0.024
11754.49	-40.00	2165787.73	16978349.74	789.30	6.945	4.51630	33.0	8.284	0.011	0.03527	73.3	72.3	0.036
11754.49	-35.00	2165792.73	16978349.86	789.30	7.957	5.26049	33.5	9.538	0.027	0.05403	63.4	72.4	0.060
11754.49	-30.00	2165797.73	16978349.98	789.30	9.104	6.13022	34.0	10.975	0.054	0.08016	55.8	74.5	0.097
11754.49	-25.00	2165802.72	16978350.09	789.30	10.365	7.11651	34.5	12.573	0.091	0.11509	51.7	76.8	0.147
11754.49	-20.00	2165807.72	16978350.21	789.30	11.684	8.17903	35.0	14.262	0.135	0.15877	49.6	79.0	0.208
11754.49	-15.00	2165812.72	16978350.32	789.30	12.957	9.23216	35.5	15.909	0.183	0.20810	48.7	81.4	0.277
11754.49	-10.00	2165817.72	16978350.44	789.30	14.039	10.14509	35.9	17.321	0.228	0.25571	48.3	84.1	0.343
11754.48	-5.00	2165822.72	16978350.55	789.30	14.772	10.77054	36.1	18.281	0.261	0.29099	48.1	87.0	0.391
11754.48	0.00	2165827.72	16978350.67	789.30	15.033	10.99435	36.2	18.624	0.273	0.30417	48.1	90.0	0.409
11754.48	5.00	2165832.72	16978350.78	789.30	14.776	10.77431	36.1	18.287	0.261	0.29127	48.1	93.0	0.391
11754.48	10.00	2165837.72	16978350.90	789.30	14.048	10.15219	35.9	17.332	0.229	0.25620	48.3	95.9	0.343
11754.48	15.00	2165842.71	16978351.02	789.30	12.968	9.24161	35.5	15.924	0.184	0.20868	48.6	98.5	0.278
11754.48	20.00	2165847.71	16978351.13	789.30	11.697	8.18957	35.0	14.279	0.136	0.15934	49.6	100.9	0.209
11754.48	25.00	2165852.71	16978351.25	789.30	10.378	7.12701	34.5	12.590	0.091	0.11558	51.7	103.2	0.147
11754.48	30.00	2165857.71	16978351.36	789.30	9.117	6.13995	34.0	10.991	0.055	0.08055	55.7	105.4	0.097
11754.48	35.00	2165862.71	16978351.48	789.30	7.968	5.26911	33.5	9.553	0.027	0.05432	63.2	107.6	0.060
11754.48	40.00	2165867.71	16978351.59	789.30	6.955	4.52373	33.0	8.297	0.011	0.03548	73.3	107.7	0.036
11754.48	45.00	2165872.71	16978351.71	789.30	6.078	3.89611	32.7	7.220	0.013	0.02231	59.9	97.3	0.024
11754.48	50.00	2165877.70	16978351.82	789.30	5.327	3.37155	32.3	6.304	0.021	0.01326	32.8	86.3	0.024
11754.48	55.00	2165882.70	16978351.94	789.30	4.686	2.93390	32.0	5.529	0.026	0.00714	15.4	85.9	0.027
11754.47	60.00	2165887.70	16978352.06	789.30	4.141	2.56814	31.8	4.872	0.029	0.00315	6.2	87.5	0.029
11754.47	65.00	2165892.70	16978352.17	789.30	3.675	2.26133	31.6	4.315	0.031	0.00138	2.6	88.8	0.031
11754.47	70.00	2165897.70	16978352.29	789.30	3.277	2.00268	31.4	3.841	0.031	0.00227	4.2	89.8	0.031
11754.47	75.00	2165902.70	16978352.40	789.30	2.936	1.78343	31.3	3.435	0.031	0.00330	6.1	90.5	0.031
11754.47	80.00	2165907.70	16978352.52	789.30	2.641	1.59649	31.1	3.086	0.030	0.00399	7.5	90.9	0.030
11754.47	85.00	2165912.70	16978352.63	789.30	2.387	1.43617	31.0	2.786	0.029	0.00441	8.6	91.3	0.029
11754.47	90.00	2165917.69	16978352.75	789.30	2.165	1.29788	30.9	2.524	0.028	0.00463	9.4	91.5	0.028
11754.47	95.00	2165922.69	16978352.86	789.30	1.972	1.17795	30.9	2.297	0.027	0.00471	10.0	91.6	0.027
11754.47	100.00	2165927.69	16978352.98	789.30	1.802	1.07338	30.8	2.097	0.025	0.00470	10.5	91.7	0.026
11754.47	105.00	2165932.69	16978353.10	789.30	1.652	0.98175	30.7	1.922	0.024	0.00463	10.9	91.8	0.024
11754.47	110.00	2165937.69	16978353.21	789.30	1.520	0.90106	30.7	1.767	0.023	0.00451	11.2	91.9	0.023
11754.47	115.00	2165942.69	16978353.33	789.30	1.403	0.82969	30.6	1.630	0.022	0.00437	11.5	91.9	0.022
11754.47	120.00	2165947.69	16978353.44	789.30	1.298	0.76629	30.6	1.507	0.020	0.00421	11.7	91.9	0.021
11754.46	125.00	2165952.68	16978353.56	789.30	1.204	0.70974	30.5	1.398	0.019	0.00405	11.9	91.9	0.020
11754.46	130.00	2165957.68	16978353.67	789.30	1.120	0.65911	30.5	1.299	0.018	0.00388	12.0	91.9	0.019
11754.46	135.00	2165962.68	16978353.79	789.30	1.044	0.61362	30.5	1.211	0.017	0.00372	12.2	91.9	0.018
11754.46	140.00	2165967.68	16978353.90	789.30	0.975	0.57261	30.4	1.131	0.016	0.00356	12.3	91.8	0.017
11754.46	145.00	2165972.68	16978354.02	789.30	0.913	0.53552	30.4	1.058	0.015	0.00340	12.4	91.8	0.016
11754.46	150.00	2165977.68	16978354.14	789.30	0.856	0.50186	30.4	0.993	0.015	0.00325	12.5	91.8	0.015
11754.46	155.00	2165982.68	16978354.25	789.30	0.805	0.47124	30.3	0.933	0.014	0.00310	12.6	91.8	0.014
11754.46	160.00	2165987.68	16978354.37	789.30	0.758	0.44331	30.3	0.878	0.013	0.00296	12.6	91.7	0.014
11754.46	165.00	2165992.67	16978354.48	789.30	0.715	0.41776	30.3	0.828	0.013	0.00283	12.7	91.7	0.013
11754.46	170.00	2165997.67	16978354.60	789.30	0.675	0.39433	30.3	0.782	0.012	0.00271	12.7	91.7	0.012
11754.46	175.00	2166002.67	16978354.71	789.30	0.639	0.37280	30.3	0.739	0.011	0.00259	12.8	91.7	0.012
11754.46	180.00	2166007.67	16978354.83	789.30	0.605	0.35297	30.3	0.700	0.011	0.00248	12.8	91.6	0.011
11754.46	185.00	2166012.67	16978354.94	789.30	0.574	0.33466	30.2	0.664	0.010	0.00237	12.9	91.6	0.011
11754.45	190.00	2166017.67	16978355.06	789.30	0.545	0.31773	30.2	0.631	0.010	0.00227	12.9	91.6	0.010
11754.45	195.00	2166022.67	16978355.18	789.30	0.518	0.30205	30.2	0.600	0.009	0.00218	12.9	91.5	0.010
11754.45	200.00	2166027.66	16978355.29	789.30	0.494	0.28748	30.2	0.571	0.009	0.00209	13.0	91.5	0.009
11754.45	205.00	2166032.66	16978355.41	789.30	0.471	0.27394	30.2	0.545	0.009	0.00200	13.0	91.5	0.009
11754.45	210.00	2166037.66	16978355.52	789.30	0.449	0.26133	30.2	0.520	0.008	0.00192	13.0	9	

11754.45	235.00	2166062.66	16978356.10	789.30	0.361	0.20959	30.2	0.417	0.007	0.00158	13.1	91.3	0.007
11754.45	240.00	2166067.65	16978356.22	789.30	0.346	0.20109	30.1	0.400	0.007	0.00152	13.1	91.3	0.007
11754.45	245.00	2166072.65	16978356.33	789.30	0.333	0.19309	30.1	0.385	0.006	0.00147	13.2	91.3	0.006
11754.45	250.00	2166077.65	16978356.45	789.30	0.320	0.18556	30.1	0.370	0.006	0.00142	13.2	91.3	0.006
11754.44	255.00	2166082.65	16978356.56	789.30	0.307	0.17846	30.1	0.356	0.006	0.00137	13.2	91.2	0.006
11754.44	260.00	2166087.65	16978356.68	789.30	0.296	0.17176	30.1	0.342	0.006	0.00132	13.2	91.2	0.006
11754.44	265.00	2166092.65	16978356.79	789.30	0.285	0.16542	30.1	0.330	0.005	0.00128	13.2	91.2	0.006
11754.44	270.00	2166097.65	16978356.91	789.30	0.275	0.15943	30.1	0.318	0.005	0.00123	13.2	91.2	0.005
11754.44	275.00	2166102.64	16978357.02	789.30	0.265	0.15376	30.1	0.306	0.005	0.00119	13.2	91.2	0.005
11754.44	280.00	2166107.64	16978357.14	789.30	0.256	0.14838	30.1	0.296	0.005	0.00115	13.2	91.2	0.005
11754.44	285.00	2166112.64	16978357.26	789.30	0.247	0.14328	30.1	0.286	0.005	0.00112	13.3	91.1	0.005
11754.44	290.00	2166117.64	16978357.37	789.30	0.239	0.13844	30.1	0.276	0.005	0.00108	13.3	91.1	0.005
11754.44	295.00	2166122.64	16978357.49	789.30	0.231	0.13384	30.1	0.267	0.004	0.00105	13.3	91.1	0.005
11754.44	300.00	2166127.64	16978357.60	789.30	0.223	0.12946	30.1	0.258	0.004	0.00102	13.3	91.1	0.004

PLS-CADD Version 15.00x64 3:59:47 PM Monday, December 17, 2018
 Sargent & Lundy
 Project Name: 'g:\xcel\w3603_str199(w3601)-byf_tp\w3606_str199(w3601)-byf_tp.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

***** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly *****

***** User may prefer to add other specific load cases utilizing alternative Strength Factors *****

***** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER *****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
 Cross section offset for graph +/-: 300.00 (ft)
 Result interval for graph: 5.00 (ft)
 Electric field limit: 0.00 (kV/m)
 Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure WXXXX-Tap to structure WXXXX-Tap 2

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
6	1	1	34.5	148.000	0	0.858
6	2	1	34.5	148.000	120	0.858
6	3	1	34.5	148.000	-120	0.858

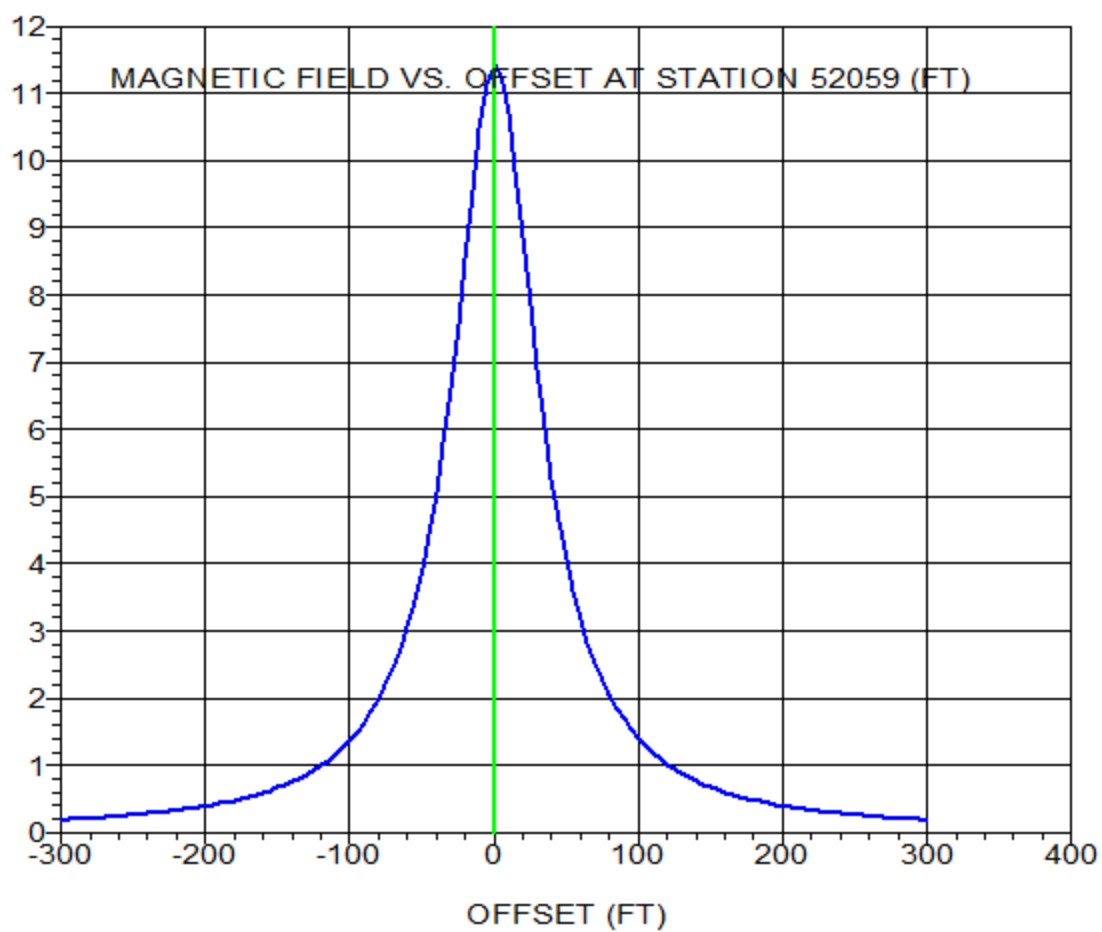
Calculated EMF Circuit Data For Last Point:

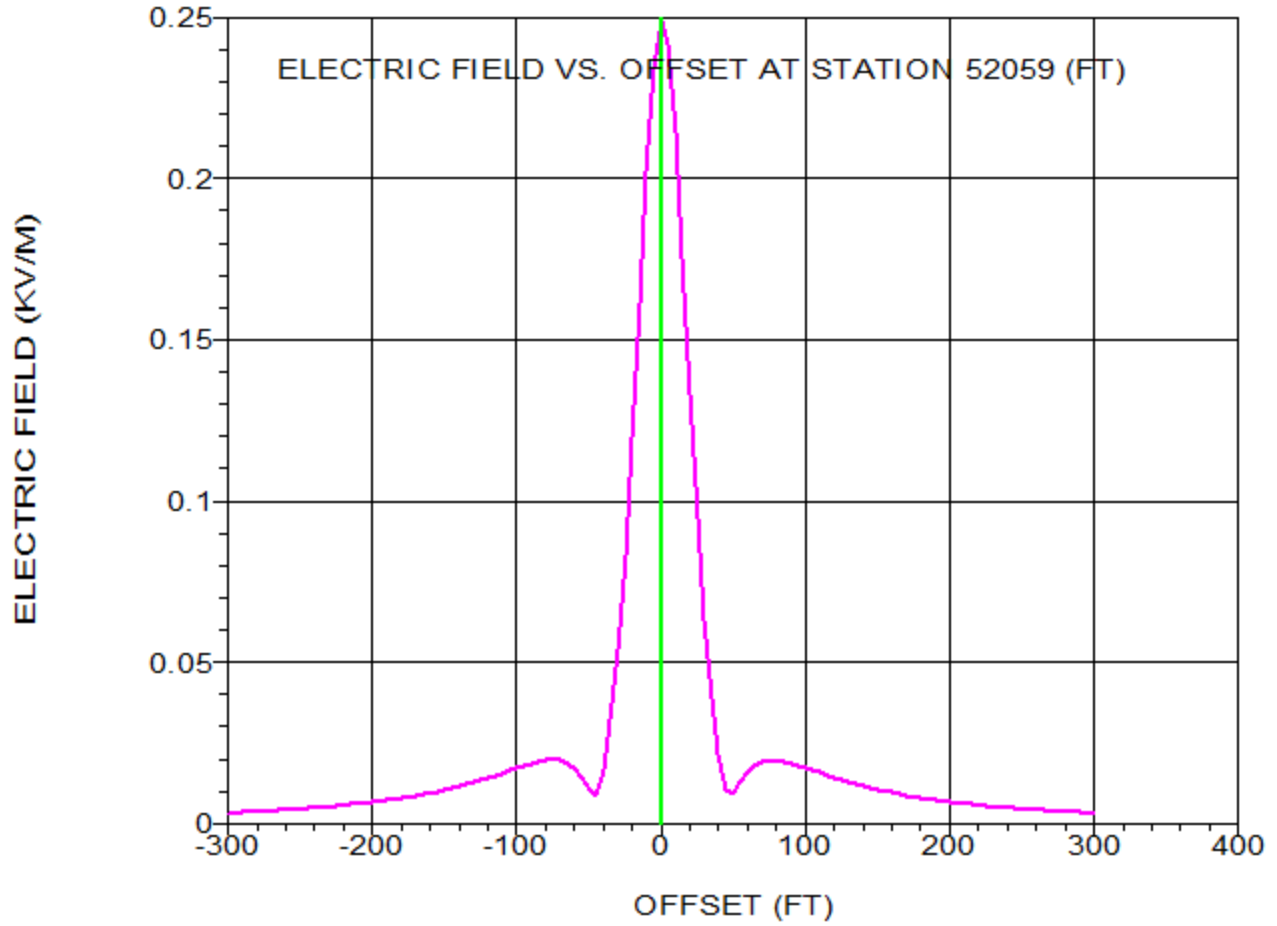
Wire station and offset are based on alignment closest to point on wire.
 In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Wire Voltage To Gnd. (kV)
6	1	212° F	Max Sag	RS	Left	2174376.08	17012236.48	887.49	52059.07	0.74	19.92
6	2	212° F	Max Sag	RS	Left	2174376.13	17012236.48	878.01	52059.07	0.78	19.92
6	3	212° F	Max Sag	RS	Left	2174376.16	17012236.47	868.53	52059.07	0.82	19.92

Maximum magnetic field of 11.43 (mG) found at station 52059.09, offset 0.00 (ft)
 Maximum electric field of 0.249 (kV/m) found at station 52059.09, offset 0.00 (ft)

MAGNETIC FIELD (MG)





EMF Calculation Results:

Station	Offset	X	Y	Z	B	B	B	Phase	B	E	E	E	E	E
Res.	(ft)	(ft)	(ft)	(ft)	Real	Img.	Angle	(deg)	(mG)	(kV/m)	(kV/m)	(deg)	Axis	rms
(deg)	(kV/m)				(mG)	(mG)							Angle	

52059.09	-300.00	2174075.43	17012228.98	836.32	0.160	0.09287	30.2	0.185	0.003	0.00100	18.4	88.9	0.003	
52059.09	-295.00	2174080.43	17012229.11	836.32	0.165	0.09581	30.2	0.191	0.003	0.00103	18.4	88.9	0.003	
52059.09	-290.00	2174085.43	17012229.23	836.32	0.170	0.09889	30.2	0.197	0.003	0.00107	18.4	88.9	0.003	
52059.09	-285.00	2174090.43	17012229.36	836.32	0.176	0.10214	30.2	0.203	0.003	0.00110	18.4	88.9	0.003	
52059.09	-280.00	2174095.43	17012229.48	836.32	0.181	0.10556	30.2	0.210	0.003	0.00114	18.4	88.9	0.004	
52059.09	-275.00	2174100.43	17012229.61	836.32	0.188	0.10917	30.2	0.217	0.004	0.00118	18.4	88.8	0.004	
52059.09	-270.00	2174105.42	17012229.73	836.32	0.194	0.11296	30.2	0.225	0.004	0.00122	18.4	88.8	0.004	
52059.09	-265.00	2174110.42	17012229.86	836.32	0.201	0.11697	30.2	0.232	0.004	0.00126	18.4	88.8	0.004	
52059.09	-260.00	2174115.42	17012229.98	836.32	0.208	0.12121	30.2	0.241	0.004	0.00130	18.4	88.8	0.004	
52059.09	-255.00	2174120.42	17012230.11	836.32	0.216	0.12569	30.2	0.250	0.004	0.00135	18.4	88.8	0.004	
52059.09	-250.00	2174125.42	17012230.23	836.32	0.224	0.13044	30.2	0.259	0.004	0.00140	18.4	88.8	0.004	
52059.09	-245.00	2174130.42	17012230.36	836.32	0.232	0.13547	30.2	0.269	0.004	0.00145	18.4	88.7	0.005	
52059.09	-240.00	2174135.41	17012230.48	836.32	0.241	0.14080	30.2	0.280	0.005	0.00151	18.4	88.7	0.005	
52059.09	-235.00	2174140.41	17012230.61	836.32	0.251	0.14647	30.3	0.291	0.005	0.00157	18.4	88.7	0.005	
52059.09	-230.00	2174145.41	17012230.73	836.32	0.261	0.15250	30.3	0.303	0.005	0.00163	18.4	88.7	0.005	
52059.09	-225.00	2174150.41	17012230.86	836.32	0.272	0.15893	30.3	0.315	0.005	0.00169	18.4	88.6	0.005	
52059.09	-220.00	2174155.41	17012230.98	836.32	0.284	0.16578	30.3	0.329	0.005	0.00176	18.4	88.6	0.006	
52059.09	-215.00	2174160.41	17012231.10	836.32	0.296	0.17309	30.3	0.343	0.006	0.00183	18.4	88.6	0.006	
52059.09	-210.00	2174165.41	17012231.23	836.32	0.310	0.18091	30.3	0.359	0.006	0.00191	18.4	88.6	0.006	
52059.09	-205.00	2174170.40	17012231.35	836.32	0.324	0.18929	30.3	0.375	0.006	0.00199	18.4	88.6	0.006	
52059.09	-200.00	2174175.40	17012231.48	836.32	0.339	0.19828	30.3	0.393	0.006	0.00208	18.4	88.5	0.007	
52059.09	-195.00	2174180.40	17012231.60	836.32	0.355	0.20793	30.3	0.412	0.007	0.00217	18.4	88.5	0.007	
52059.09	-190.00	2174185.40	17012231.73	836.32	0.373	0.21832	30.4	0.432	0.007	0.00226	18.4	88.5	0.007	
52059.09	-185.00	2174190.40	17012231.85	836.32	0.392	0.22953	30.4	0.454	0.007	0.00237	18.4	88.5	0.008	
52059.09	-180.00	2174195.40	17012231.98	836.32	0.412	0.24163	30.4	0.477	0.007	0.00248	18.4	88.4	0.008	
52059.09	-175.00	2174200.39	17012232.10	836.32	0.434	0.25472	30.4	0.503	0.008	0.00259	18.4	88.4	0.008	

52059.09	-170.00	2174205.39	17012232.23	836.32	0.458	0.26893	30.4	0.531	0.008	0.00272	18.4	88.4	0.009
52059.09	-165.00	2174210.39	17012232.35	836.32	0.483	0.28436	30.5	0.561	0.009	0.00285	18.4	88.4	0.009
52059.09	-160.00	2174215.39	17012232.48	836.32	0.511	0.30118	30.5	0.594	0.009	0.00299	18.4	88.3	0.009
52059.09	-155.00	2174220.39	17012232.60	836.32	0.542	0.31954	30.5	0.629	0.009	0.00314	18.4	88.3	0.010
52059.09	-150.00	2174225.39	17012232.73	836.32	0.575	0.33963	30.6	0.668	0.010	0.00329	18.3	88.3	0.010
52059.09	-145.00	2174230.39	17012232.85	836.32	0.612	0.36168	30.6	0.711	0.010	0.00346	18.3	88.3	0.011
52059.09	-140.00	2174235.38	17012232.98	836.32	0.652	0.38594	30.6	0.758	0.011	0.00364	18.3	88.3	0.012
52059.09	-135.00	2174240.38	17012233.10	836.32	0.696	0.41272	30.7	0.809	0.012	0.00382	18.3	88.2	0.012
52059.09	-130.00	2174245.38	17012233.23	836.32	0.745	0.44237	30.7	0.866	0.012	0.00402	18.3	88.2	0.013
52059.09	-125.00	2174250.38	17012233.35	836.32	0.799	0.47529	30.8	0.929	0.013	0.00422	18.2	88.2	0.013
52059.09	-120.00	2174255.38	17012233.48	836.32	0.858	0.51197	30.8	0.999	0.013	0.00443	18.2	88.3	0.014
52059.09	-115.00	2174260.38	17012233.60	836.32	0.925	0.55301	30.9	1.077	0.014	0.00464	18.1	88.3	0.015
52059.09	-110.00	2174265.37	17012233.72	836.32	0.999	0.59907	30.9	1.165	0.015	0.00486	18.1	88.3	0.016
52059.09	-105.00	2174270.37	17012233.85	836.32	1.082	0.65099	31.0	1.263	0.016	0.00507	18.0	88.4	0.016
52059.09	-100.00	2174275.37	17012233.97	836.32	1.176	0.70977	31.1	1.373	0.016	0.00527	17.8	88.5	0.017
52059.09	-95.00	2174280.37	17012234.10	836.32	1.281	0.77661	31.2	1.498	0.017	0.00544	17.7	88.6	0.018
52059.09	-90.00	2174285.37	17012234.22	836.32	1.401	0.85296	31.3	1.640	0.018	0.00557	17.4	88.8	0.019
52059.09	-85.00	2174290.37	17012234.35	836.32	1.537	0.94061	31.5	1.802	0.018	0.00563	17.1	89.1	0.019
52059.09	-80.00	2174295.36	17012234.47	836.32	1.693	1.04176	31.6	1.988	0.019	0.00559	16.6	89.5	0.020
52059.09	-75.00	2174300.36	17012234.60	836.32	1.871	1.15910	31.8	2.201	0.019	0.00538	15.8	90.1	0.020
52059.09	-70.00	2174305.36	17012234.72	836.32	2.076	1.29594	32.0	2.448	0.019	0.00495	14.7	91.0	0.019
52059.09	-65.00	2174310.36	17012234.85	836.32	2.313	1.45638	32.2	2.734	0.018	0.00417	12.9	92.3	0.019
52059.09	-60.00	2174315.36	17012234.97	836.32	2.588	1.64547	32.5	3.066	0.017	0.00297	10.1	94.5	0.017
52059.09	-55.00	2174320.36	17012235.10	836.32	2.906	1.86935	32.8	3.455	0.014	0.00173	6.9	98.2	0.014
52059.09	-50.00	2174325.36	17012235.22	836.32	3.276	2.13542	33.1	3.910	0.011	0.00348	18.2	103.8	0.011
52059.09	-45.00	2174330.35	17012235.35	836.32	3.705	2.45231	33.5	4.443	0.006	0.00817	53.6	78.4	0.008
52059.09	-40.00	2174335.35	17012235.47	836.32	4.201	2.82956	34.0	5.065	0.008	0.01537	62.6	64.0	0.017
52059.09	-35.00	2174340.35	17012235.60	836.32	4.771	3.27656	34.5	5.788	0.019	0.02582	53.2	69.7	0.032
52059.09	-30.00	2174345.35	17012235.72	836.32	5.415	3.80020	35.1	6.615	0.036	0.04051	48.5	73.6	0.054
52059.09	-25.00	2174350.35	17012235.85	836.32	6.126	4.40020	35.7	7.543	0.057	0.06037	46.5	76.3	0.083
52059.09	-20.00	2174355.35	17012235.97	836.32	6.881	5.06136	36.3	8.542	0.083	0.08573	45.8	78.7	0.120
52059.09	-15.00	2174360.34	17012236.09	836.32	7.633	5.74302	37.0	9.552	0.112	0.11537	45.8	81.0	0.161
52059.09	-10.00	2174365.34	17012236.22	836.32	8.303	6.37046	37.5	10.465	0.140	0.14555	46.1	83.5	0.202
52059.09	-5.00	2174370.34	17012236.34	836.32	8.792	6.83943	37.9	11.139	0.162	0.16980	46.4	86.4	0.235
52059.09	0.00	2174375.34	17012236.47	836.32	9.005	7.04646	38.0	11.434	0.172	0.18103	46.5	89.5	0.249
52059.09	5.00	2174380.34	17012236.59	836.32	8.893	6.93821	38.0	11.279	0.167	0.17534	46.5	92.6	0.242
52059.09	10.00	2174385.34	17012236.72	836.32	8.482	6.54303	37.6	10.712	0.148	0.15478	46.2	95.6	0.214
52059.09	15.00	2174390.34	17012236.84	836.32	7.856	5.95372	37.2	9.857	0.122	0.12583	45.9	98.2	0.175
52059.09	20.00	2174395.33	17012236.97	836.32	7.120	5.27902	36.6	8.864	0.093	0.09551	45.7	100.5	0.133
52059.09	25.00	2174400.33	17012237.09	836.32	6.359	4.60480	35.9	7.851	0.066	0.06852	46.1	102.8	0.095
52059.09	30.00	2174405.33	17012237.22	836.32	5.629	3.98211	35.3	6.895	0.043	0.04683	47.6	105.3	0.063
52059.09	35.00	2174410.33	17012237.34	836.32	4.962	3.43313	34.7	6.034	0.025	0.03050	51.1	108.6	0.039
52059.09	40.00	2174415.33	17012237.47	836.32	4.368	2.96190	34.1	5.278	0.011	0.01873	58.7	113.5	0.022
52059.09	45.00	2174420.33	17012237.59	836.32	3.849	2.56316	33.7	4.625	0.005	0.01053	63.9	116.0	0.011
52059.09	50.00	2174425.32	17012237.72	836.32	3.400	2.22796	33.2	4.065	0.009	0.00501	30.0	76.2	0.009
52059.09	55.00	2174430.32	17012237.84	836.32	3.012	1.94661	32.9	3.586	0.013	0.00190	8.4	79.8	0.013
52059.09	60.00	2174435.32	17012237.97	836.32	2.678	1.71013	32.6	3.178	0.016	0.00232	8.4	84.3	0.016
52059.09	65.00	2174440.32	17012238.09	836.32	2.391	1.51070	32.3	2.828	0.017	0.00364	11.8	87.0	0.018
52059.09	70.00	2174445.32	17012238.22	836.32	2.143	1.34176	32.1	2.528	0.018	0.00456	14.0	88.6	0.019
52059.09	75.00	2174450.32	17012238.34	836.32	1.929	1.19794	31.8	2.270	0.019	0.00512	15.3	89.6	0.019
52059.09	80.00	2174455.32	17012238.47	836.32	1.742	1.07484	31.7	2.047	0.019	0.00540	16.2	90.3	0.019
52059.09	85.00	2174460.31	17012238.59	836.32	1.580	0.96893	31.5	1.854	0.018	0.00551	16.8	90.7	0.019
52059.09	90.00	2174465.31	17012238.71	836.32	1.438	0.87730	31.4	1.685	0.018	0.00549	17.2	91.1	0.019
52059.09	95.00	2174470.31	17012238.84	836.32	1.314	0.79763	31.3	1.537	0.017	0.00539	17.5	91.3	0.018
52059.09	100.00	2174475.31	17012238.96	836.32	1.204	0.72801	31.2	1.407	0.016	0.00524	17.7	91.4	0.017
52059.09	105.00	2174480.31	17012239.09	836.32	1.107	0.66688	31.1	1.293	0.016	0.00505	17.8	91.6	0.016
52059.09	110.00	2174485.31	17012239.21	836.32	1.021	0.61297	31.0	1.191	0.015	0.00485	17.9	91.6	0.016
52059.09	115.00	2174490.30	17012239.34	836.32	0.944	0.56520	30.9	1.100	0.014	0.00464	18.0	91.7	0.015
52059.09	120.00	2174495.30	17012239.46	836.32	0.876	0.52272	30.8	1.020	0.014	0.00443	18.1	91.7	0.014
52059.09	125.00	2174500.30	17012239.59	836.32	0.814	0.48478	30.8	0.947	0.013	0.00422	18.1	91.7	0.014
52059.09	130.00	2174505.30	17012239.71	836.32	0.758	0.45078	30.7	0.882	0.012	0.00402	18.2	91.7	0.013
52059.09	135.00	2174510.30	17012239.84	836.32	0.708	0.42020	30.7	0.824	0.012	0.00383	18.2	91.7	0.012
52059.09	140.00	2174515.30	17012239.96	836.32	0.663	0.39261	30.6	0.771	0.011	0.00364	18.2	91.7	0.012
52059.09	145.00	2174520.29	17012240.09	836.32	0.622	0.36764	30.6	0.722	0.011	0.00347	18.2	91.7	0.011
52059.09	150.00	2174525.29	17012240.21	836.32	0.584	0.34496	30.6	0.679	0.010	0.00330	18.3	91.7	0.011
52059.09	155.00	2174530.29	17012240.34	836.32	0.550	0.32433	30.5	0.639	0.010	0.00314	18.3	91.7	0.010
52059.09	160.00	2174535.29	17012240.46	836.32	0.519	0.30549	30.5	0.602	0.009	0.00299	18.3	91.7	0.010
52059.09	165.00	2174540.29	17012240.59	836.32	0.490	0.28825	30.5	0.569	0.009	0.00285	18.3	91.6	0.009
52059.09	170.00	2174545.29	17012240.71	836.32	0.464	0.27244	30.4	0.538	0.008	0.00272	18.3	91.6	0.009
52059.09	175.00	2174550.29	17012240.84	836.32	0.439	0.25790	30.4	0.509	0.008	0.00260	18.3	91.6	0.008
52059.09	180.00	2174555.28	17012240.96	836.32	0.417	0.24451	30.4	0.483	0.007	0.00248	18.3	91.6	0.008
52059.09	185.00	2174560.28	17012241.08	836.32	0.396	0.23214	30.4	0.459	0.007	0.00237	18.3	91.5	0.008
52059.09	190.00	2174565.28	17012241.21	836.32	0.377	0.22070	30.4	0.437	0.007	0.00226	18.3	91.5	0.007
52059.09	195.00	2174570.28	17012241.33	836.32	0.359	0.21010	30.3	0.416	0.007	0.00217	18.3	91.5	0.007
52059.09	200.00	2174575.28	17012241.46	836.32	0.342	0.20026	30.3	0.397	0.006	0.00207	18.3	91.5	0.007
52059.09	205.00	2174580.28	17012241.58	836.32	0.327	0.19110	30.3	0.379	0.006	0.00199	18.3	91.4	0.006
52059.09	210.00	2174585.27	17012241.71	836.32	0.313	0.18257	30.3	0.362	0.006	0.00191	18.3	91.4	0.0

52059.09	235.00	2174610.27	17012242.33	836.32	0.253	0.14757	30.2	0.293	0.005	0.00156	18.3	91.3	0.005
52059.09	240.00	2174615.27	17012242.46	836.32	0.243	0.14182	30.2	0.282	0.005	0.00150	18.3	91.3	0.005
52059.09	245.00	2174620.26	17012242.58	836.32	0.234	0.13640	30.2	0.271	0.004	0.00145	18.3	91.3	0.005
52059.09	250.00	2174625.26	17012242.71	836.32	0.226	0.13131	30.2	0.261	0.004	0.00140	18.3	91.3	0.004
52059.09	255.00	2174630.26	17012242.83	836.32	0.217	0.12650	30.2	0.251	0.004	0.00135	18.3	91.2	0.004
52059.09	260.00	2174635.26	17012242.96	836.32	0.210	0.12196	30.2	0.243	0.004	0.00130	18.3	91.2	0.004
52059.09	265.00	2174640.26	17012243.08	836.32	0.202	0.11768	30.2	0.234	0.004	0.00125	18.3	91.2	0.004
52059.09	270.00	2174645.26	17012243.21	836.32	0.195	0.11362	30.2	0.226	0.004	0.00121	18.3	91.2	0.004
52059.09	275.00	2174650.25	17012243.33	836.32	0.189	0.10978	30.2	0.218	0.004	0.00117	18.3	91.2	0.004
52059.09	280.00	2174655.25	17012243.46	836.32	0.183	0.10614	30.2	0.211	0.003	0.00113	18.3	91.1	0.004
52059.09	285.00	2174660.25	17012243.58	836.32	0.177	0.10269	30.2	0.204	0.003	0.00109	18.3	91.1	0.003
52059.09	290.00	2174665.25	17012243.70	836.32	0.171	0.09941	30.2	0.198	0.003	0.00106	18.2	91.1	0.003
52059.09	295.00	2174670.25	17012243.83	836.32	0.166	0.09629	30.1	0.192	0.003	0.00103	18.2	91.1	0.003
52059.09	300.00	2174675.25	17012243.95	836.32	0.161	0.09333	30.1	0.186	0.003	0.00099	18.2	91.1	0.003

PLS-CADD Version 15.00x64 3:57:19 PM Monday, December 17, 2018
 Sargent & Lundy
 Project Name: 'g:\xcel\w3603_str199(w3601)-byf_tp\w3606_str199(w3601)-byf_tp.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

***** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly *****

***** User may prefer to add other specific load cases utilizing alternative Strength Factors *****

***** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER *****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
 Cross section offset for graph +/-: 300.00 (ft)
 Result interval for graph: 5.00 (ft)
 Electric field limit: 0.00 (kV/m)
 Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure W3603-175 to structure W3603-176

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
5	1	1	34.5	148.000	0	0.858
5	2	1	34.5	148.000	120	0.858
5	3	1	34.5	148.000	-120	0.858

Calculated EMF Circuit Data For Last Point:

Wire station and offset are based on alignment closest to point on wire.

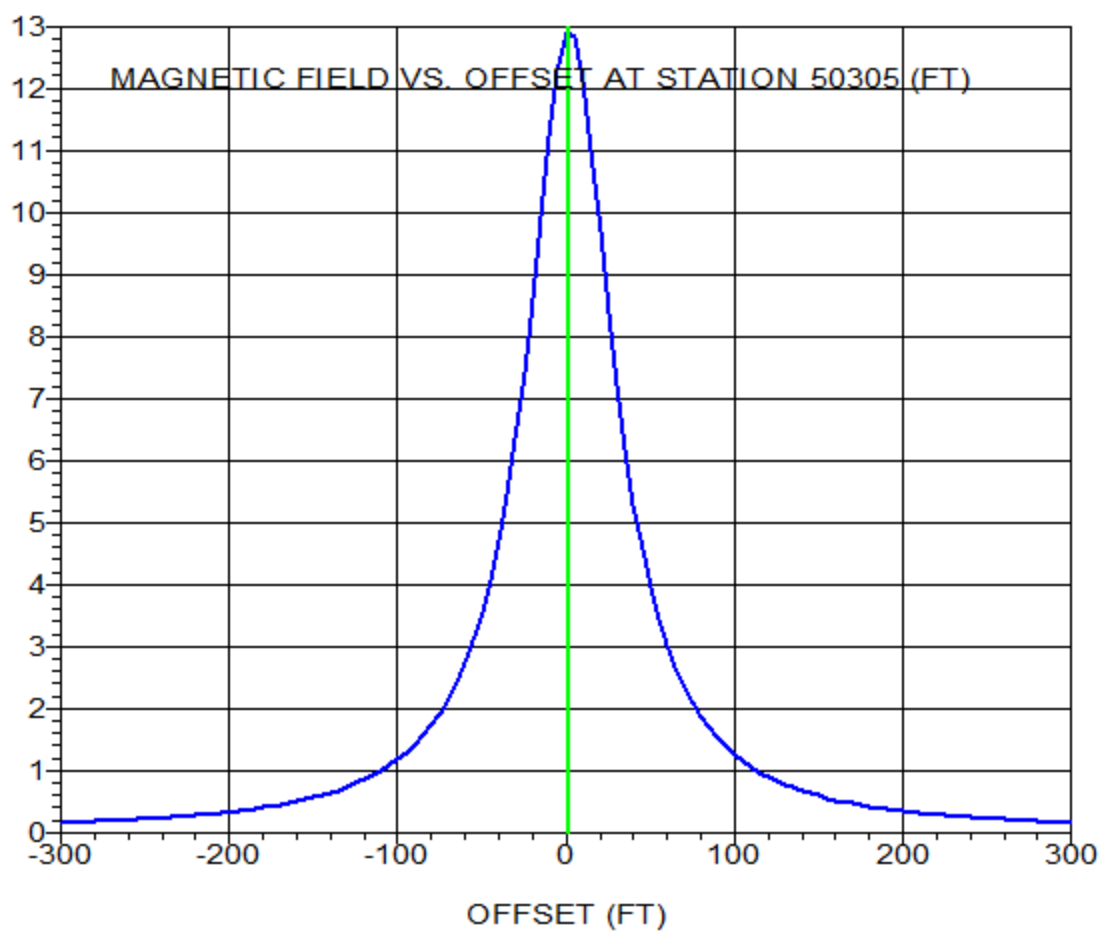
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

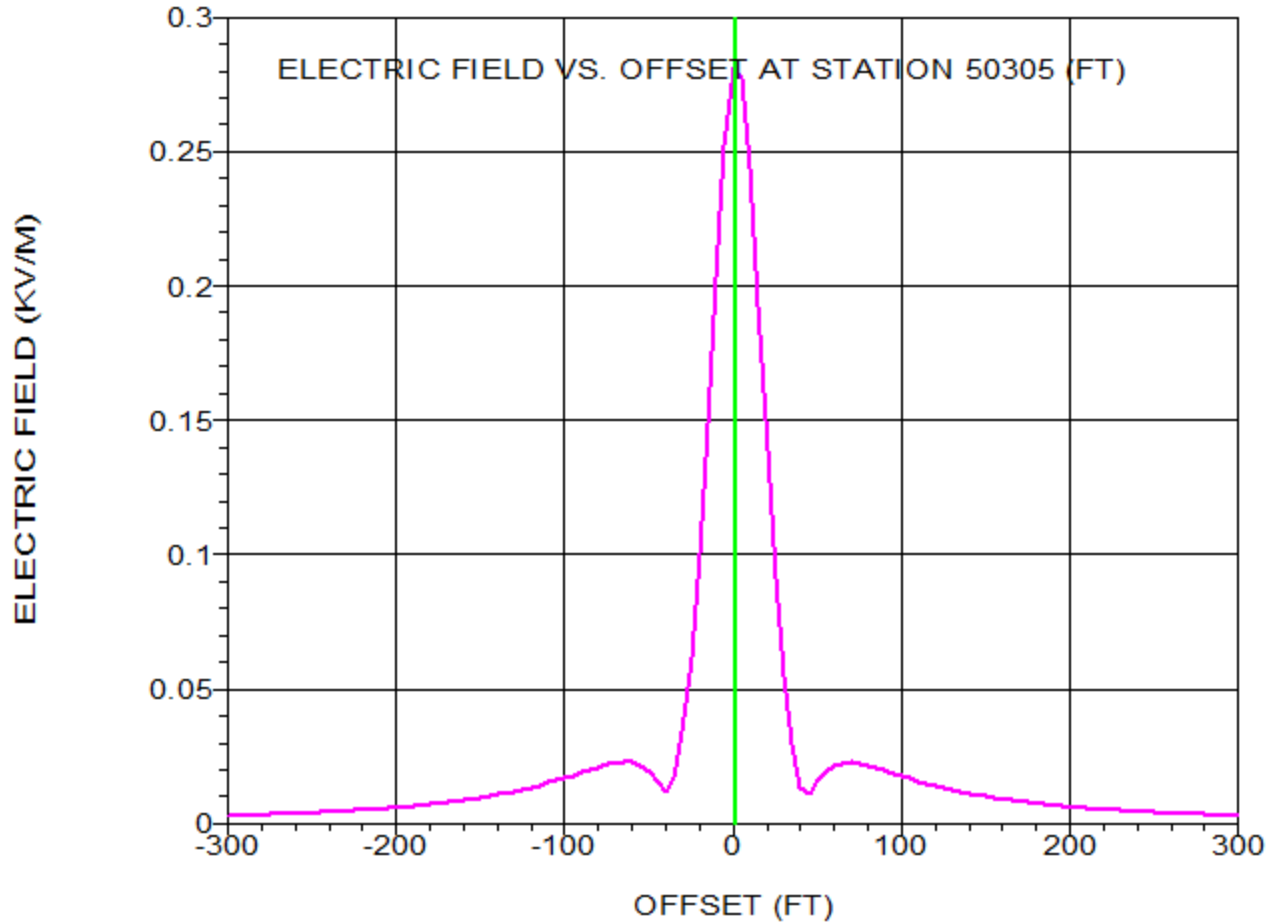
Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Wire Voltage To Gnd. (kV)
5	1	212° F Max Sag	RS	Left	2175060.22	17012577.96	929.47	50304.56	2.04	0.858	19.92
5	2	212° F Max Sag	RS	Left	2175060.28	17012577.88	921.25	50304.56	2.14	0.858	19.92
5	3	212° F Max Sag	RS	Left	2175060.22	17012577.96	913.33	50304.56	2.04	0.858	19.92

Maximum magnetic field of 12.88 (mG) found at station 50304.52, offset 0.00 (ft)

Maximum electric field of 0.281 (kV/m) found at station 50304.52, offset 0.00 (ft)

MAGNETIC FIELD (MG)





EMF Calculation Results:

Station	Offset	X	Y	Z	B Real	B B Img.	B Phase Angle	B rms Res.	E Real	E E Img.	E Phase Angle	E Axis Angle	E rms
Res.	(ft)	(ft)	(ft)	(ft)	(mG)	(mG)	(deg)	(mG)	(kV/m)	(kV/m)	(deg)		
(deg)	(kV/m)												

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50304.52	-300.00	2174877.09	17012818.16	884.90	0.134	0.07466	29.2	0.153	0.003	0.00084	17.4	88.9	0.003
50304.52	-295.00	2174880.12	17012814.18	884.90	0.138	0.07709	29.2	0.158	0.003	0.00087	17.4	88.9	0.003
50304.52	-290.00	2174883.16	17012810.20	884.90	0.143	0.07965	29.2	0.163	0.003	0.00090	17.3	88.9	0.003
50304.52	-285.00	2174886.19	17012806.23	884.90	0.147	0.08235	29.2	0.169	0.003	0.00093	17.3	88.9	0.003
50304.52	-280.00	2174889.22	17012802.25	884.90	0.152	0.08518	29.2	0.175	0.003	0.00096	17.3	88.8	0.003
50304.52	-275.00	2174892.25	17012798.27	884.90	0.158	0.08817	29.2	0.181	0.003	0.00099	17.3	88.8	0.003
50304.52	-270.00	2174895.28	17012794.30	884.90	0.163	0.09132	29.2	0.187	0.003	0.00103	17.3	88.8	0.003
50304.52	-265.00	2174898.31	17012790.32	884.90	0.169	0.09465	29.3	0.194	0.003	0.00106	17.3	88.8	0.004
50304.52	-260.00	2174901.34	17012786.34	884.90	0.175	0.09816	29.3	0.201	0.004	0.00110	17.3	88.8	0.004
50304.52	-255.00	2174904.37	17012782.37	884.90	0.182	0.10188	29.3	0.208	0.004	0.00114	17.3	88.8	0.004
50304.52	-250.00	2174907.40	17012778.39	884.90	0.189	0.10581	29.3	0.216	0.004	0.00118	17.3	88.7	0.004
50304.52	-245.00	2174910.43	17012774.41	884.90	0.196	0.10999	29.3	0.225	0.004	0.00123	17.3	88.7	0.004
50304.52	-240.00	2174913.47	17012770.44	884.90	0.204	0.11442	29.3	0.234	0.004	0.00127	17.3	88.7	0.004
50304.52	-235.00	2174916.50	17012766.46	884.90	0.212	0.11913	29.3	0.243	0.004	0.00132	17.3	88.7	0.004
50304.52	-230.00	2174919.53	17012762.48	884.90	0.221	0.12413	29.4	0.253	0.004	0.00138	17.3	88.6	0.005
50304.52	-225.00	2174922.56	17012758.51	884.90	0.230	0.12947	29.4	0.264	0.005	0.00143	17.3	88.6	0.005
50304.52	-220.00	2174925.59	17012754.53	884.90	0.240	0.13516	29.4	0.275	0.005	0.00149	17.3	88.6	0.005
50304.52	-215.00	2174928.62	17012750.55	884.90	0.251	0.14123	29.4	0.288	0.005	0.00155	17.3	88.6	0.005
50304.52	-210.00	2174931.65	17012746.58	884.90	0.262	0.14774	29.4	0.301	0.005	0.00162	17.3	88.5	0.005
50304.52	-205.00	2174934.68	17012742.60	884.90	0.274	0.15470	29.4	0.315	0.005	0.00169	17.3	88.5	0.006
50304.52	-200.00	2174937.71	17012738.62	884.90	0.287	0.16217	29.5	0.330	0.006	0.00176	17.3	88.5	0.006
50304.52	-195.00	2174940.74	17012734.65	884.90	0.301	0.17021	29.5	0.346	0.006	0.00184	17.3	88.5	0.006
50304.52	-190.00	2174943.77	17012730.67	884.90	0.316	0.17885	29.5	0.363	0.006	0.00193	17.3	88.4	0.006
50304.52	-185.00	2174946.81	17012726.69	884.90	0.332	0.18818	29.5	0.382	0.006	0.00202	17.3	88.4	0.007
50304.52	-180.00	2174949.84	17012722.72	884.90	0.350	0.19826	29.5	0.402	0.007	0.00212	17.3	88.4	0.007
50304.52	-175.00	2174952.87	17012718.74	884.90	0.369	0.20917	29.6	0.424	0.007	0.00222	17.2	88.3	0.007

50304.52	-170.00	2174955.90	17012714.76	884.90	0.389	0.22101	29.6	0.448	0.008	0.00233	17.2	88.3	0.008
50304.52	-165.00	2174958.93	17012710.79	884.90	0.412	0.23389	29.6	0.473	0.008	0.00245	17.2	88.3	0.008
50304.52	-160.00	2174961.96	17012706.81	884.90	0.436	0.24792	29.6	0.501	0.008	0.00257	17.2	88.2	0.009
50304.52	-155.00	2174964.99	17012702.83	884.90	0.462	0.26325	29.7	0.532	0.009	0.00271	17.2	88.2	0.009
50304.52	-150.00	2174968.02	17012698.86	884.90	0.491	0.28005	29.7	0.565	0.009	0.00285	17.2	88.2	0.010
50304.52	-145.00	2174971.05	17012694.88	884.90	0.523	0.29850	29.7	0.602	0.010	0.00301	17.2	88.1	0.010
50304.52	-140.00	2174974.08	17012690.90	884.90	0.558	0.31882	29.8	0.642	0.010	0.00317	17.1	88.1	0.011
50304.52	-135.00	2174977.12	17012686.93	884.90	0.596	0.34127	29.8	0.687	0.011	0.00335	17.1	88.1	0.011
50304.52	-130.00	2174980.15	17012682.95	884.90	0.639	0.36615	29.8	0.736	0.012	0.00353	17.1	88.0	0.012
50304.52	-125.00	2174983.18	17012678.97	884.90	0.686	0.39383	29.9	0.791	0.012	0.00373	17.0	88.0	0.013
50304.52	-120.00	2174986.21	17012675.00	884.90	0.738	0.42473	29.9	0.852	0.013	0.00395	17.0	88.0	0.014
50304.52	-115.00	2174989.24	17012671.02	884.90	0.797	0.45934	30.0	0.920	0.014	0.00417	16.9	88.0	0.014
50304.52	-110.00	2174992.27	17012667.05	884.90	0.862	0.49829	30.0	0.996	0.015	0.00440	16.9	88.0	0.015
50304.52	-105.00	2174995.30	17012663.07	884.90	0.936	0.54231	30.1	1.082	0.015	0.00465	16.8	88.0	0.016
50304.52	-100.00	2174998.33	17012659.09	884.90	1.019	0.59228	30.2	1.179	0.016	0.00489	16.7	88.0	0.017
50304.52	-95.00	2175001.36	17012655.12	884.90	1.114	0.64929	30.2	1.289	0.017	0.00514	16.5	88.1	0.018
50304.52	-90.00	2175004.39	17012651.14	884.90	1.221	0.71468	30.3	1.415	0.018	0.00537	16.3	88.2	0.019
50304.52	-85.00	2175007.43	17012647.16	884.90	1.345	0.79010	30.4	1.560	0.019	0.00557	16.1	88.3	0.020
50304.52	-80.00	2175010.46	17012643.19	884.90	1.487	0.87761	30.6	1.726	0.020	0.00573	15.8	88.5	0.021
50304.52	-75.00	2175013.49	17012639.21	884.90	1.651	0.97979	30.7	1.920	0.021	0.00579	15.3	88.8	0.022
50304.52	-70.00	2175016.52	17012635.23	884.90	1.841	1.09989	30.9	2.145	0.022	0.00572	14.7	89.2	0.023
50304.52	-65.00	2175019.55	17012631.26	884.90	2.064	1.24204	31.0	2.409	0.022	0.00543	13.7	89.9	0.023
50304.52	-60.00	2175022.58	17012627.28	884.90	2.326	1.41148	31.3	2.721	0.022	0.00481	12.2	91.0	0.023
50304.52	-55.00	2175025.61	17012623.30	884.90	2.635	1.61489	31.5	3.090	0.021	0.00372	9.9	92.7	0.022
50304.52	-50.00	2175028.64	17012619.33	884.90	3.001	1.86078	31.8	3.531	0.019	0.00223	6.6	95.5	0.019
50304.52	-45.00	2175031.67	17012615.35	884.90	3.435	2.15984	32.2	4.058	0.016	0.00306	11.0	100.2	0.016
50304.52	-40.00	2175034.70	17012611.37	884.90	3.952	2.52522	32.6	4.690	0.010	0.00800	37.7	100.0	0.012
50304.52	-35.00	2175037.73	17012607.40	884.90	4.565	2.97239	33.1	5.447	0.007	0.01625	65.3	62.3	0.017
50304.52	-30.00	2175040.77	17012603.42	884.90	5.286	3.51779	33.6	6.349	0.019	0.02888	56.6	66.8	0.034
50304.52	-25.00	2175043.80	17012599.44	884.90	6.121	4.17496	34.3	7.409	0.040	0.04750	50.0	71.5	0.062
50304.52	-20.00	2175046.83	17012595.47	884.90	7.058	4.94563	35.0	8.618	0.068	0.07361	47.2	74.9	0.100
50304.52	-15.00	2175049.86	17012591.49	884.90	8.057	5.80318	35.8	9.929	0.103	0.10756	46.2	77.8	0.149
50304.52	-10.00	2175052.89	17012587.51	884.90	9.025	6.66944	36.5	11.222	0.141	0.14644	46.1	80.9	0.203
50304.52	-5.00	2175055.92	17012583.54	884.90	9.813	7.39958	37.0	12.290	0.174	0.18232	46.3	84.4	0.252
50304.52	0.00	2175058.95	17012579.56	884.90	10.244	8.10001	37.3	12.882	0.194	0.20337	46.4	88.3	0.281
50304.52	5.00	2175061.98	17012575.58	884.90	10.198	7.76975	37.3	12.821	0.192	0.20063	46.3	92.4	0.278
50304.52	10.00	2175065.01	17012571.61	884.90	9.688	7.29269	37.0	12.126	0.170	0.17523	45.9	96.3	0.244
50304.52	15.00	2175068.04	17012567.63	884.90	8.852	6.52679	36.4	10.998	0.135	0.13747	45.5	99.7	0.193
50304.52	20.00	2175071.08	17012563.65	884.90	7.869	5.65377	35.7	9.689	0.097	0.09882	45.4	102.8	0.139
50304.52	25.00	2175074.11	17012559.68	884.90	6.876	4.80724	35.0	8.390	0.064	0.06622	46.2	105.8	0.092
50304.52	30.00	2175077.14	17012555.70	884.90	5.955	4.05496	34.3	7.205	0.036	0.04169	48.8	109.6	0.055
50304.52	35.00	2175080.17	17012551.72	884.90	5.141	3.41724	33.6	6.173	0.017	0.02451	55.3	115.4	0.030
50304.52	40.00	2175083.20	17012547.75	884.90	4.440	2.88945	33.1	5.298	0.007	0.01303	61.8	121.9	0.013
50304.52	45.00	2175086.23	17012543.77	884.90	3.846	2.45716	32.6	4.564	0.011	0.00575	28.0	72.8	0.011
50304.52	50.00	2175089.26	17012539.79	884.90	3.346	2.10394	32.2	3.952	0.016	0.00222	7.9	79.7	0.016
50304.52	55.00	2175092.29	17012535.82	884.90	2.925	1.81466	31.8	3.442	0.019	0.00323	9.5	84.8	0.019
50304.52	60.00	2175095.32	17012531.84	884.90	2.570	1.57658	31.5	3.015	0.021	0.00470	12.6	87.5	0.022
50304.52	65.00	2175098.35	17012527.86	884.90	2.271	1.37942	31.3	2.657	0.022	0.00560	14.4	89.2	0.023
50304.52	70.00	2175101.39	17012523.89	884.90	2.017	1.21501	31.1	2.354	0.022	0.00606	15.5	90.2	0.023
50304.52	75.00	2175104.42	17012519.91	884.90	1.800	1.07692	30.9	2.098	0.021	0.00622	16.2	90.8	0.022
50304.52	80.00	2175107.45	17012515.93	884.90	1.615	0.96012	30.7	1.879	0.021	0.00620	16.7	91.2	0.022
50304.52	85.00	2175110.48	17012511.96	884.90	1.455	0.86064	30.6	1.691	0.020	0.00605	17.0	91.5	0.021
50304.52	90.00	2175113.51	17012507.98	884.90	1.317	0.77536	30.5	1.528	0.019	0.00584	17.2	91.7	0.020
50304.52	95.00	2175116.54	17012504.01	884.90	1.197	0.70179	30.4	1.388	0.018	0.00559	17.3	91.8	0.019
50304.52	100.00	2175119.57	17012500.03	884.90	1.092	0.63795	30.3	1.265	0.017	0.00532	17.4	91.9	0.018
50304.52	105.00	2175122.60	17012496.05	884.90	1.000	0.58224	30.2	1.157	0.016	0.00504	17.5	92.0	0.017
50304.52	110.00	2175125.63	17012492.08	884.90	0.918	0.53338	30.1	1.062	0.015	0.00477	17.5	92.0	0.016
50304.52	115.00	2175128.66	17012488.10	884.90	0.846	0.49030	30.1	0.978	0.014	0.00451	17.6	92.0	0.015
50304.52	120.00	2175131.69	17012484.12	884.90	0.782	0.45216	30.0	0.904	0.013	0.00426	17.6	92.0	0.014
50304.52	125.00	2175134.73	17012480.15	884.90	0.725	0.41825	30.0	0.837	0.013	0.00402	17.6	92.0	0.013
50304.52	130.00	2175137.76	17012476.17	884.90	0.674	0.38796	29.9	0.778	0.012	0.00380	17.6	92.0	0.013
50304.52	135.00	2175140.79	17012472.19	884.90	0.628	0.36081	29.9	0.724	0.011	0.00359	17.6	91.9	0.012
50304.52	140.00	2175143.82	17012468.22	884.90	0.586	0.33638	29.9	0.676	0.011	0.00340	17.7	91.9	0.011
50304.52	145.00	2175146.85	17012464.24	884.90	0.548	0.31434	29.8	0.632	0.010	0.00321	17.7	91.9	0.011
50304.52	150.00	2175149.88	17012460.26	884.90	0.514	0.29438	29.8	0.593	0.010	0.00304	17.7	91.9	0.010
50304.52	155.00	2175152.91	17012456.29	884.90	0.483	0.27625	29.8	0.557	0.009	0.00288	17.7	91.8	0.010
50304.52	160.00	2175155.94	17012452.31	884.90	0.455	0.25974	29.7	0.524	0.009	0.00273	17.7	91.8	0.009
50304.52	165.00	2175158.97	17012448.33	884.90	0.429	0.24466	29.7	0.494	0.008	0.00260	17.7	91.8	0.009
50304.52	170.00	2175162.00	17012444.36	884.90	0.405	0.23085	29.7	0.466	0.008	0.00247	17.6	91.7	0.008
50304.52	175.00	2175165.04	17012440.38	884.90	0.383	0.21818	29.7	0.441	0.007	0.00235	17.6	91.7	0.008
50304.52	180.00	2175168.07	17012436.40	884.90	0.363	0.20653	29.6	0.418	0.007	0.00223	17.6	91.7	0.007
50304.52	185.00	2175171.10	17012432.43	884.90	0.344	0.19578	29.6	0.396	0.007	0.00213	17.6	91.6	0.007
50304.52	190.00	2175174.13	17012428.45	884.90	0.327	0.18585	29.6	0.376	0.006	0.00203	17.6	91.6	0.007
50304.52	195.00	2175177.16	17012424.47	884.90	0.311	0.17667	29.6	0.358	0.006	0.00194	17.6	91.6	0.006
50304.52	200.00	2175180.19	17012420.50	884.90	0.296	0.16815	29.6	0.341	0.006	0.00185	17.6	91.5	0.006
50304.52	205.00	2175183.22	17012416.52	884.90	0.283	0.16023	29.5	0.325	0.006	0.00177	17.6	91.5	0.006
50304.52	210.00	2175186.25	17012412.54	884.90	0.270	0.15286	29.5	0.310	0.005	0.00169	17.6	91.5	0

50304.52	235.00	2175201.41	17012392.66	884.90	0.217	0.12272	29.5	0.250	0.004	0.00138	17.6	91.4	0.005
50304.52	240.00	2175204.44	17012388.68	884.90	0.209	0.11778	29.4	0.240	0.004	0.00132	17.6	91.3	0.004
50304.52	245.00	2175207.47	17012384.71	884.90	0.201	0.11313	29.4	0.230	0.004	0.00127	17.6	91.3	0.004
50304.52	250.00	2175210.50	17012380.73	884.90	0.193	0.10876	29.4	0.221	0.004	0.00123	17.6	91.3	0.004
50304.52	255.00	2175213.53	17012376.75	884.90	0.186	0.10464	29.4	0.213	0.004	0.00118	17.6	91.3	0.004
50304.52	260.00	2175216.56	17012372.78	884.90	0.179	0.10076	29.4	0.205	0.004	0.00114	17.6	91.2	0.004
50304.52	265.00	2175219.59	17012368.80	884.90	0.172	0.09709	29.4	0.198	0.003	0.00110	17.6	91.2	0.004
50304.52	270.00	2175222.62	17012364.82	884.90	0.166	0.09362	29.4	0.191	0.003	0.00106	17.6	91.2	0.004
50304.52	275.00	2175225.65	17012360.85	884.90	0.161	0.09033	29.4	0.184	0.003	0.00102	17.6	91.2	0.003
50304.52	280.00	2175228.69	17012356.87	884.90	0.155	0.08722	29.4	0.178	0.003	0.00099	17.6	91.2	0.003
50304.52	285.00	2175231.72	17012352.89	884.90	0.150	0.08427	29.3	0.172	0.003	0.00096	17.6	91.1	0.003
50304.52	290.00	2175234.75	17012348.92	884.90	0.145	0.08147	29.3	0.166	0.003	0.00092	17.6	91.1	0.003
50304.52	295.00	2175237.78	17012344.94	884.90	0.140	0.07882	29.3	0.161	0.003	0.00089	17.6	91.1	0.003
50304.52	300.00	2175240.81	17012340.97	884.90	0.136	0.07629	29.3	0.156	0.003	0.00087	17.6	91.1	0.003

PLS-CADD Version 15.00x64 12:07:21 PM Friday, December 14, 2018
Sargent & Lundy
Project Name: 'g:\xcel\w3601_str30(w3315)-str199\w3601_str30(w3315)-str199.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

***** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly *****

***** User may prefer to add other specific load cases utilizing alternative Strength Factors *****

***** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER *****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
Cross section offset for graph +/-: 300.00 (ft)
Result interval for graph: 5.00 (ft)
Electric field limit: 0.00 (kV/m)
Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure W3601-165 to structure W3601-166

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
5	1	1	34.5	151.000	0	0.858
5	2	1	34.5	151.000	120	0.858
5	3	1	34.5	151.000	-120	0.858
6	1	1	34.5	151.000	0	0.858
6	2	1	34.5	151.000	120	0.858
6	3	1	34.5	151.000	-120	0.858

Calculated EMF Circuit Data For Last Point:

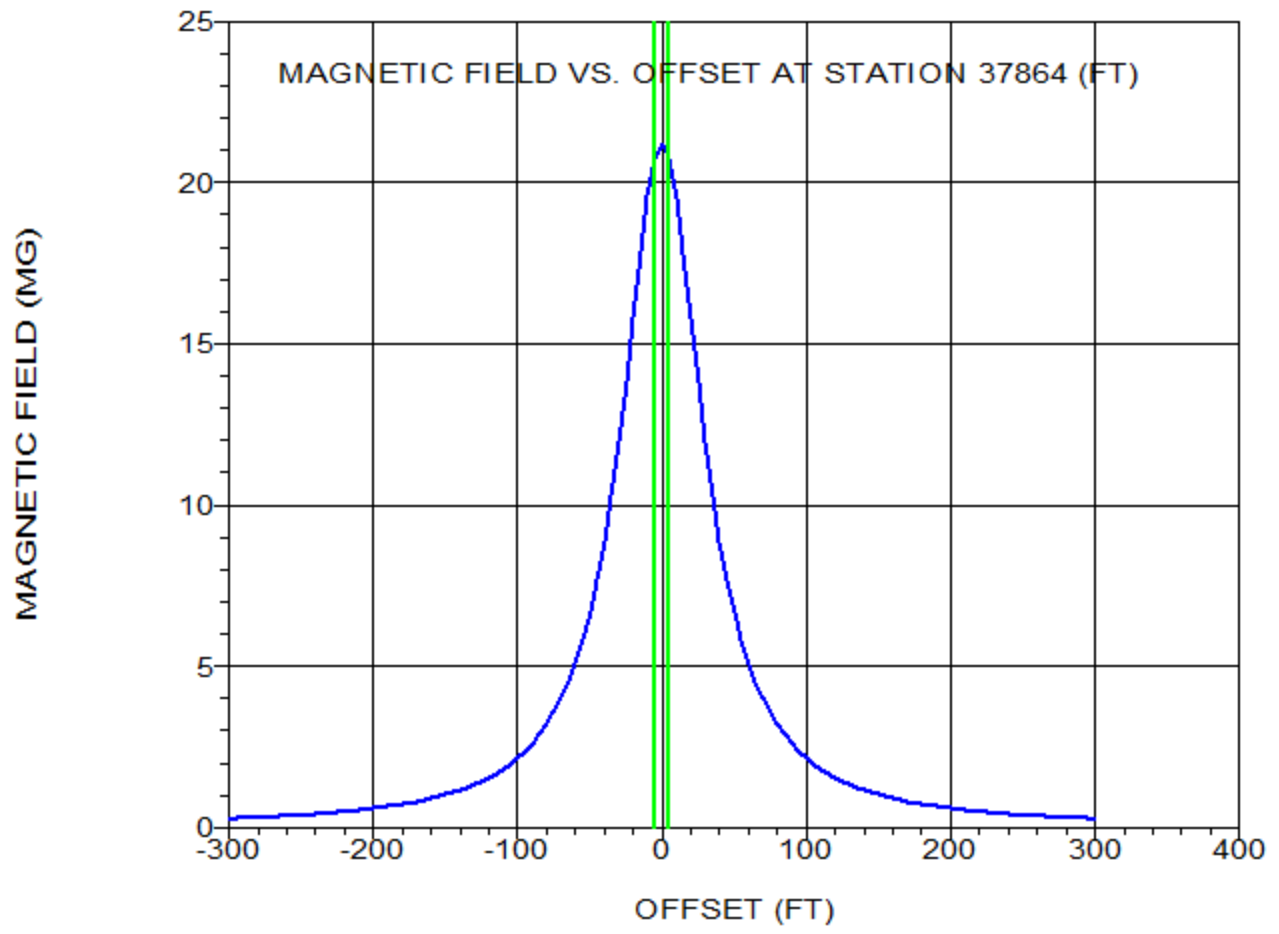
Wire station and offset are based on alignment closest to point on wire.

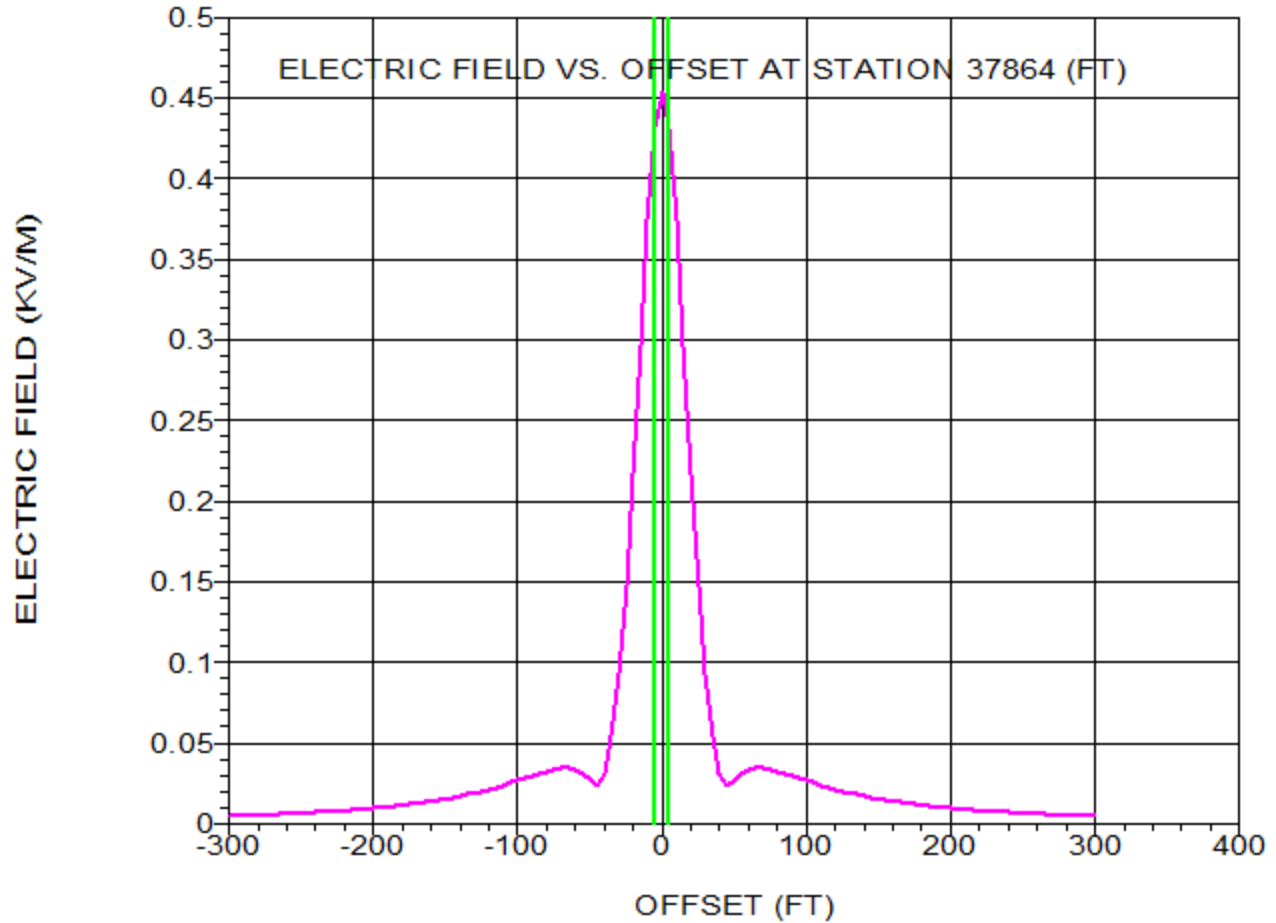
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Wire Voltage To Gnd. (kV)
5	1	212° F Max Sag RS		Left	2158368.24	16961511.68	974.81	37864.36	4.60	0.858	19.92
5	2	212° F Max Sag RS		Left	2158368.24	16961511.68	967.81	37864.36	4.60	0.858	19.92
5	3	212° F Max Sag RS		Left	2158368.24	16961511.68	960.81	37864.36	4.60	0.858	19.92
6	1	212° F Max Sag RS		Left	2158359.04	16961511.65	974.80	37864.36	-4.60	0.858	19.92
6	2	212° F Max Sag RS		Left	2158359.04	16961511.65	967.80	37864.36	-4.60	0.858	19.92
6	3	212° F Max Sag RS		Left	2158359.04	16961511.65	960.80	37864.36	-4.60	0.858	19.92

Maximum magnetic field of 21.17 (mG) found at station 37864.36, offset 0.00 (ft)

Maximum electric field of 0.453 (kV/m) found at station 37864.36, offset 0.00 (ft)





EMF Calculation Results:

Station	Offset	X	Y	Z	B Real	B B Img.	B B Phase Angle	B rms Res.	E Real	E E Img.	E E Phase Angle	E Axis Angle	E rms
Res. (deg)	(ft)	(ft)	(ft)	(ft)	(mG)	(mG)	(deg)	(mG)	(kV/m)	(kV/m)	(deg)		
---	---	---	---	---	---	---	---	---	---	---	---	---	---
37864.36	-300.00	2158063.64	16961510.89	931.31	0.228	0.13223	30.1	0.264	0.004	0.00105	13.8	88.9	0.004
37864.36	-295.00	2158068.64	16961510.90	931.31	0.236	0.13671	30.1	0.273	0.004	0.00109	13.8	88.9	0.005
37864.36	-290.00	2158073.64	16961510.92	931.31	0.244	0.14141	30.1	0.282	0.005	0.00112	13.8	88.9	0.005
37864.36	-285.00	2158078.64	16961510.93	931.31	0.252	0.14637	30.1	0.292	0.005	0.00116	13.8	88.9	0.005
37864.36	-280.00	2158083.64	16961510.94	931.31	0.261	0.15158	30.1	0.302	0.005	0.00120	13.8	88.8	0.005
37864.36	-275.00	2158088.64	16961510.96	931.31	0.271	0.15708	30.1	0.313	0.005	0.00124	13.7	88.8	0.005
37864.36	-270.00	2158093.64	16961510.97	931.31	0.281	0.16289	30.1	0.325	0.005	0.00128	13.7	88.8	0.005
37864.36	-265.00	2158098.64	16961510.98	931.31	0.291	0.16902	30.1	0.337	0.005	0.00133	13.7	88.8	0.006
37864.36	-260.00	2158103.64	16961510.99	931.31	0.302	0.17550	30.1	0.350	0.006	0.00137	13.7	88.8	0.006
37864.36	-255.00	2158108.64	16961511.01	931.31	0.314	0.18236	30.1	0.363	0.006	0.00142	13.7	88.7	0.006
37864.36	-250.00	2158113.64	16961511.02	931.31	0.327	0.18963	30.1	0.378	0.006	0.00148	13.7	88.7	0.006
37864.36	-245.00	2158118.64	16961511.03	931.31	0.340	0.19734	30.1	0.393	0.006	0.00153	13.7	88.7	0.006
37864.36	-240.00	2158123.64	16961511.05	931.31	0.354	0.20552	30.1	0.409	0.007	0.00159	13.7	88.7	0.007
37864.36	-235.00	2158128.64	16961511.06	931.31	0.369	0.21423	30.1	0.427	0.007	0.00165	13.7	88.7	0.007
37864.36	-230.00	2158133.64	16961511.07	931.31	0.385	0.22350	30.2	0.445	0.007	0.00171	13.7	88.6	0.007
37864.36	-225.00	2158138.64	16961511.08	931.31	0.402	0.23337	30.2	0.464	0.007	0.00178	13.6	88.6	0.008
37864.36	-220.00	2158143.64	16961511.10	931.31	0.420	0.24392	30.2	0.485	0.008	0.00186	13.6	88.6	0.008
37864.36	-215.00	2158148.64	16961511.11	931.31	0.439	0.25518	30.2	0.508	0.008	0.00193	13.6	88.6	0.008
37864.36	-210.00	2158153.64	16961511.12	931.31	0.459	0.26725	30.2	0.532	0.008	0.00201	13.6	88.5	0.009
37864.36	-205.00	2158158.64	16961511.14	931.31	0.482	0.28018	30.2	0.557	0.009	0.00210	13.6	88.5	0.009
37864.36	-200.00	2158163.64	16961511.15	931.31	0.505	0.29407	30.2	0.585	0.009	0.00219	13.6	88.5	0.009
37864.36	-195.00	2158168.64	16961511.16	931.31	0.531	0.30901	30.2	0.614	0.010	0.00229	13.5	88.4	0.010
37864.36	-190.00	2158173.64	16961511.17	931.31	0.558	0.32510	30.2	0.646	0.010	0.00239	13.5	88.4	0.010
37864.36	-185.00	2158178.64	16961511.19	931.31	0.588	0.34248	30.2	0.680	0.010	0.00250	13.5	88.4	0.011
37864.36	-180.00	2158183.64	16961511.20	931.31	0.620	0.36128	30.2	0.717	0.011	0.00262	13.5	88.4	0.011
37864.36	-175.00	2158188.64	16961511.21	931.31	0.654	0.38165	30.3	0.757	0.011	0.00274	13.4	88.3	0.012

37864.36	-170.00	2158193.64	16961511.23	931.31	0.692	0.40377	30.3	0.801	0.012	0.00287	13.4	88.3	0.012
37864.36	-165.00	2158198.64	16961511.24	931.31	0.732	0.42786	30.3	0.848	0.013	0.00301	13.3	88.3	0.013
37864.36	-160.00	2158203.64	16961511.25	931.31	0.777	0.45414	30.3	0.900	0.013	0.00315	13.3	88.2	0.014
37864.36	-155.00	2158208.64	16961511.26	931.31	0.825	0.48289	30.3	0.956	0.014	0.00331	13.2	88.2	0.014
37864.36	-150.00	2158213.64	16961511.28	931.31	0.878	0.51442	30.4	1.018	0.015	0.00348	13.2	88.2	0.015
37864.36	-145.00	2158218.64	16961511.29	931.31	0.937	0.54909	30.4	1.086	0.016	0.00365	13.1	88.1	0.016
37864.36	-140.00	2158223.64	16961511.30	931.31	1.001	0.58734	30.4	1.161	0.017	0.00383	13.0	88.1	0.017
37864.36	-135.00	2158228.64	16961511.32	931.31	1.072	0.62966	30.4	1.243	0.017	0.00403	13.0	88.1	0.018
37864.36	-130.00	2158233.64	16961511.33	931.31	1.150	0.67664	30.5	1.335	0.019	0.00423	12.9	88.1	0.019
37864.36	-125.00	2158238.64	16961511.34	931.31	1.238	0.72898	30.5	1.436	0.020	0.00444	12.7	88.0	0.020
37864.36	-120.00	2158243.64	16961511.35	931.31	1.335	0.78749	30.5	1.550	0.021	0.00465	12.6	88.0	0.021
37864.36	-115.00	2158248.64	16961511.37	931.31	1.444	0.85318	30.6	1.677	0.022	0.00486	12.4	88.0	0.023
37864.36	-110.00	2158253.64	16961511.38	931.31	1.566	0.92723	30.6	1.820	0.023	0.00507	12.2	88.0	0.024
37864.36	-105.00	2158258.64	16961511.39	931.31	1.704	1.01107	30.7	1.981	0.025	0.00526	12.0	88.1	0.025
37864.36	-100.00	2158263.64	16961511.41	931.31	1.860	1.10646	30.8	2.164	0.026	0.00543	11.7	88.1	0.027
37864.36	-95.00	2158268.64	16961511.42	931.31	2.037	1.21552	30.8	2.372	0.028	0.00555	11.3	88.2	0.028
37864.36	-90.00	2158273.64	16961511.43	931.31	2.240	1.34089	30.9	2.611	0.029	0.00560	10.9	88.3	0.030
37864.36	-85.00	2158278.64	16961511.44	931.31	2.473	1.48583	31.0	2.885	0.031	0.00554	10.2	88.5	0.031
37864.36	-80.00	2158283.64	16961511.46	931.31	2.741	1.65438	31.1	3.202	0.032	0.00532	9.4	88.8	0.032
37864.36	-75.00	2158288.64	16961511.47	931.31	3.053	1.85163	31.2	3.571	0.033	0.00485	8.3	89.2	0.033
37864.36	-70.00	2158293.64	16961511.48	931.31	3.416	2.08395	31.4	4.001	0.034	0.00402	6.8	89.8	0.034
37864.36	-65.00	2158298.64	16961511.50	931.31	3.841	2.35938	31.6	4.508	0.034	0.00275	4.6	90.6	0.034
37864.36	-60.00	2158303.64	16961511.51	931.31	4.341	2.68805	31.8	5.106	0.033	0.00177	3.1	91.9	0.033
37864.36	-55.00	2158308.64	16961511.52	931.31	4.931	3.08266	32.0	5.816	0.030	0.00433	8.1	93.8	0.030
37864.36	-50.00	2158313.64	16961511.54	931.31	5.630	3.55890	32.3	6.661	0.025	0.00980	21.1	95.6	0.027
37864.36	-45.00	2158318.64	16961511.55	931.31	6.458	4.13564	32.6	7.668	0.018	0.01833	46.1	90.2	0.024
37864.36	-40.00	2158323.64	16961511.56	931.31	7.435	4.83434	33.0	8.868	0.011	0.03120	71.3	72.3	0.031
37864.36	-35.00	2158328.64	16961511.57	931.31	8.578	5.67658	33.5	10.286	0.023	0.05023	65.0	70.3	0.035
37864.36	-30.00	2158333.64	16961511.59	931.31	9.895	6.67799	34.0	11.937	0.052	0.07763	56.3	72.8	0.093
37864.36	-25.00	2158338.64	16961511.60	931.31	11.367	7.83591	34.6	13.806	0.091	0.11551	51.6	75.4	0.147
37864.36	-20.00	2158343.64	16961511.61	931.31	12.933	9.10928	35.2	15.819	0.141	0.16455	49.4	78.0	0.217
37864.36	-15.00	2158348.64	16961511.63	931.31	14.472	10.39606	35.7	17.819	0.197	0.22173	48.4	80.6	0.296
37864.36	-10.00	2158353.64	16961511.64	931.31	15.797	11.52813	36.1	19.556	0.250	0.27839	48.1	83.5	0.374
37864.36	-5.00	2158358.64	16961511.65	931.31	16.700	12.30929	36.4	20.747	0.289	0.32108	48.0	86.7	0.432
37864.36	0.00	2158363.64	16961511.66	931.31	17.021	12.58759	36.5	21.170	0.303	0.33705	48.0	90.0	0.453
37864.36	5.00	2158368.64	16961511.68	931.31	16.699	12.30821	36.4	20.745	0.289	0.32106	48.0	93.3	0.432
37864.36	10.00	2158373.64	16961511.69	931.31	15.795	11.52641	36.1	19.553	0.250	0.27837	48.1	96.5	0.374
37864.36	15.00	2158378.64	16961511.70	931.31	14.470	10.39424	35.7	17.816	0.197	0.22172	48.4	99.4	0.296
37864.36	20.00	2158383.64	16961511.72	931.31	12.932	9.10770	35.2	15.817	0.141	0.16455	49.4	102.0	0.217
37864.36	25.00	2158388.64	16961511.73	931.31	11.365	7.83469	34.6	13.804	0.091	0.11552	51.6	104.6	0.147
37864.36	30.00	2158393.64	16961511.74	931.31	9.894	6.67710	34.0	11.936	0.052	0.07764	56.3	107.2	0.093
37864.36	35.00	2158398.64	16961511.75	931.31	8.577	5.67594	33.5	10.285	0.023	0.05025	65.0	109.7	0.055
37864.36	40.00	2158403.64	16961511.77	931.31	7.434	4.83389	33.0	8.867	0.011	0.03122	71.3	107.7	0.031
37864.36	45.00	2158408.64	16961511.78	931.31	6.457	4.13533	32.6	7.668	0.018	0.01835	46.1	89.8	0.024
37864.36	50.00	2158413.64	16961511.79	931.31	5.630	3.55867	32.3	6.660	0.025	0.00981	21.2	84.4	0.027
37864.36	55.00	2158418.64	16961511.81	931.31	4.931	3.08250	32.0	5.815	0.030	0.00434	8.2	86.2	0.030
37864.36	60.00	2158423.64	16961511.82	931.31	4.341	2.68793	31.8	5.106	0.033	0.00177	3.1	88.1	0.033
37864.36	65.00	2158428.64	16961511.83	931.31	3.841	2.35929	31.6	4.508	0.034	0.00274	4.6	89.4	0.034
37864.36	70.00	2158433.64	16961511.84	931.31	3.416	2.08388	31.4	4.001	0.034	0.00401	6.8	90.2	0.034
37864.36	75.00	2158438.64	16961511.86	931.31	3.053	1.85158	31.2	3.570	0.033	0.00484	8.3	90.8	0.033
37864.36	80.00	2158443.64	16961511.87	931.31	2.741	1.65435	31.1	3.202	0.032	0.00531	9.4	91.2	0.032
37864.36	85.00	2158448.64	16961511.88	931.31	2.473	1.48580	31.0	2.885	0.031	0.00554	10.2	91.5	0.031
37864.36	90.00	2158453.64	16961511.90	931.31	2.240	1.34087	30.9	2.611	0.029	0.00560	10.9	91.7	0.030
37864.36	95.00	2158458.64	16961511.91	931.31	2.037	1.21550	30.8	2.372	0.028	0.00555	11.3	91.8	0.028
37864.36	100.00	2158463.64	16961511.92	931.31	1.860	1.10644	30.8	2.164	0.026	0.00542	11.7	91.9	0.027
37864.36	105.00	2158468.64	16961511.93	931.31	1.704	1.01106	30.7	1.981	0.025	0.00526	12.0	91.9	0.025
37864.36	110.00	2158473.64	16961511.95	931.31	1.566	0.92722	30.6	1.820	0.023	0.00506	12.2	92.0	0.024
37864.36	115.00	2158478.64	16961511.96	931.31	1.444	0.85317	30.6	1.677	0.022	0.00486	12.4	92.0	0.023
37864.36	120.00	2158483.64	16961511.97	931.31	1.335	0.78749	30.5	1.550	0.021	0.00465	12.6	92.0	0.021
37864.36	125.00	2158488.64	16961511.99	931.31	1.238	0.72897	30.5	1.436	0.020	0.00443	12.7	92.0	0.020
37864.36	130.00	2158493.64	16961512.00	931.31	1.150	0.67664	30.5	1.335	0.019	0.00423	12.9	91.9	0.019
37864.36	135.00	2158498.64	16961512.01	931.31	1.072	0.62966	30.4	1.243	0.017	0.00403	13.0	91.9	0.018
37864.36	140.00	2158503.64	16961512.02	931.31	1.001	0.58734	30.4	1.161	0.017	0.00383	13.0	91.9	0.017
37864.36	145.00	2158508.64	16961512.04	931.31	0.937	0.54909	30.4	1.086	0.016	0.00365	13.1	91.9	0.016
37864.36	150.00	2158513.64	16961512.05	931.31	0.878	0.51441	30.4	1.018	0.015	0.00348	13.2	91.8	0.015
37864.36	155.00	2158518.64	16961512.06	931.31	0.825	0.48289	30.3	0.956	0.014	0.00331	13.2	91.8	0.014
37864.36	160.00	2158523.64	16961512.08	931.31	0.777	0.45414	30.3	0.900	0.013	0.00315	13.3	91.8	0.014
37864.36	165.00	2158528.64	16961512.09	931.31	0.732	0.42786	30.3	0.848	0.013	0.00301	13.3	91.7	0.013
37864.36	170.00	2158533.64	16961512.10	931.31	0.692	0.40377	30.3	0.801	0.012	0.00287	13.4	91.7	0.012
37864.36	175.00	2158538.64	16961512.11	931.31	0.654	0.38165	30.3	0.757	0.011	0.00274	13.4	91.7	0.012
37864.36	180.00	2158543.64	16961512.13	931.31	0.620	0.36128	30.2	0.717	0.011	0.00261	13.5	91.6	0.011
37864.36	185.00	2158548.64	16961512.14	931.31	0.588	0.34248	30.2	0.680	0.010	0.00250	13.5	91.6	0.011
37864.36	190.00	2158553.64	16961512.15	931.31	0.558	0.32510	30.2	0.646	0.010	0.00239	13.5	91.6	0.010
37864.36	195.00	2158558.64	16961512.17	931.31	0.531	0.30901	30.2	0.614	0.010	0.00229	13.5	91.6	0.010
37864.36	200.00	2158563.64	16961512.18	931.31	0.505	0.29407	30.2	0.585	0.009	0.00219	13.6	91.5	0.009
37864.36	205.00	2158568.64	16961512.19	931.31	0.482	0.28018	30.2	0.557	0.009	0.00210	13.6	91.5	0.009
37864.36	210.00	2158573.64	16961512.20	931.31	0.459	0.26725	30.2	0.532	0.008	0.00201	13.6		

37864.36	235.00	2158598.64	16961512.27	931.31	0.369	0.21423	30.1	0.427	0.007	0.00165	13.7	91.3	0.007
37864.36	240.00	2158603.64	16961512.28	931.31	0.354	0.20552	30.1	0.409	0.007	0.00159	13.7	91.3	0.007
37864.36	245.00	2158608.64	16961512.29	931.31	0.340	0.19734	30.1	0.393	0.006	0.00153	13.7	91.3	0.006
37864.36	250.00	2158613.64	16961512.31	931.31	0.327	0.18963	30.1	0.378	0.006	0.00148	13.7	91.3	0.006
37864.36	255.00	2158618.64	16961512.32	931.31	0.314	0.18236	30.1	0.363	0.006	0.00142	13.7	91.3	0.006
37864.36	260.00	2158623.64	16961512.33	931.31	0.302	0.17550	30.1	0.350	0.006	0.00137	13.7	91.2	0.006
37864.36	265.00	2158628.64	16961512.35	931.31	0.291	0.16902	30.1	0.337	0.005	0.00133	13.7	91.2	0.006
37864.36	270.00	2158633.64	16961512.36	931.31	0.281	0.16289	30.1	0.325	0.005	0.00128	13.7	91.2	0.005
37864.36	275.00	2158638.64	16961512.37	931.31	0.271	0.15708	30.1	0.313	0.005	0.00124	13.7	91.2	0.005
37864.36	280.00	2158643.64	16961512.38	931.31	0.261	0.15158	30.1	0.302	0.005	0.00120	13.8	91.2	0.005
37864.36	285.00	2158648.64	16961512.40	931.31	0.252	0.14637	30.1	0.292	0.005	0.00116	13.8	91.1	0.005
37864.36	290.00	2158653.64	16961512.41	931.31	0.244	0.14141	30.1	0.282	0.005	0.00112	13.8	91.1	0.005
37864.36	295.00	2158658.64	16961512.42	931.31	0.236	0.13671	30.1	0.273	0.004	0.00109	13.8	91.1	0.005
37864.36	300.00	2158663.64	16961512.44	931.31	0.228	0.13223	30.1	0.264	0.004	0.00105	13.8	91.1	0.004

PLS-CADD Version 15.00x64 12:08:54 PM Friday, December 14, 2018
 Sargent & Lundy
 Project Name: 'g:\xcel\w3601_str30(w3315)-str199\w3601_str30(w3315)-str199.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

***** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly *****

***** User may prefer to add other specific load cases utilizing alternative Strength Factors *****

***** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER *****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
 Cross section offset for graph +/-: 300.00 (ft)
 Result interval for graph: 5.00 (ft)
 Electric field limit: 0.00 (kV/m)
 Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure W3315-30 to structure W3601-52

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
5	1	1	34.5	151.000	0	0.858
5	2	1	34.5	151.000	120	0.858
5	3	1	34.5	151.000	-120	0.858

Calculated EMF Circuit Data For Last Point:

Wire station and offset are based on alignment closest to point on wire.

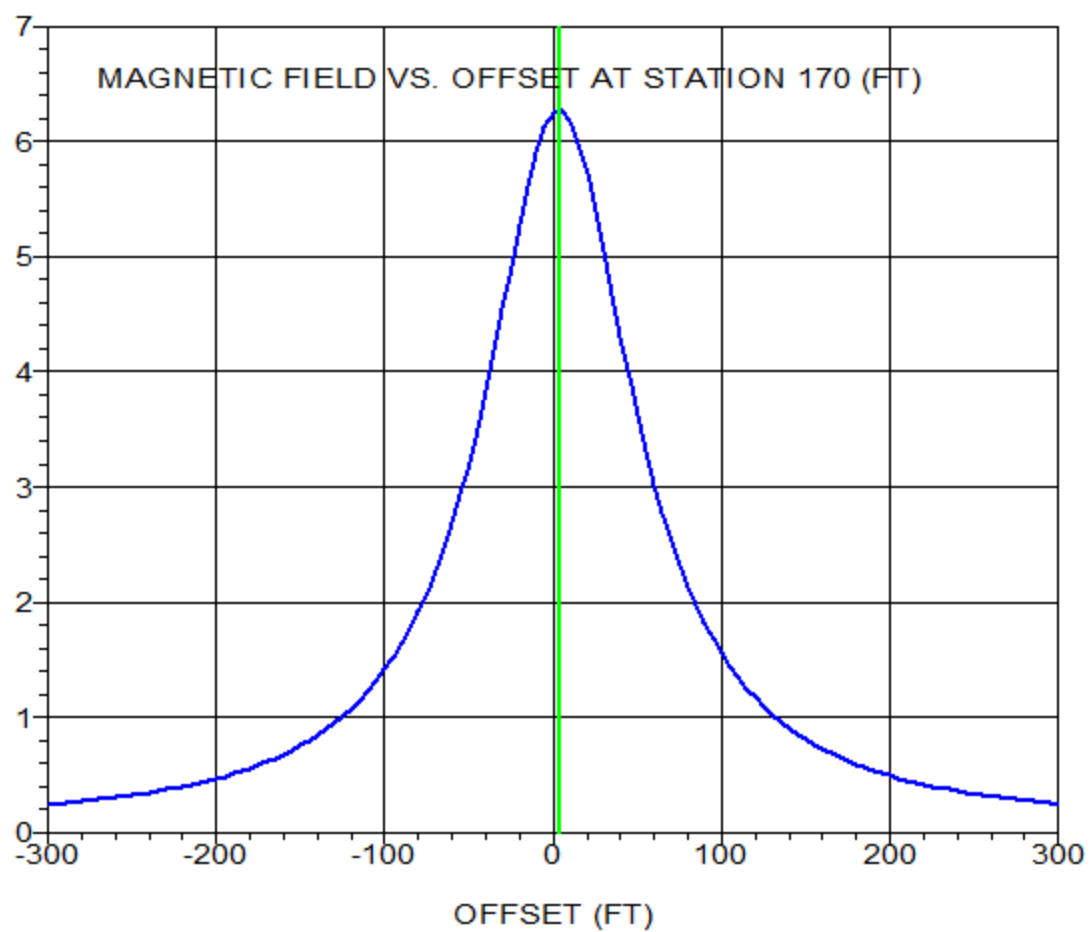
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

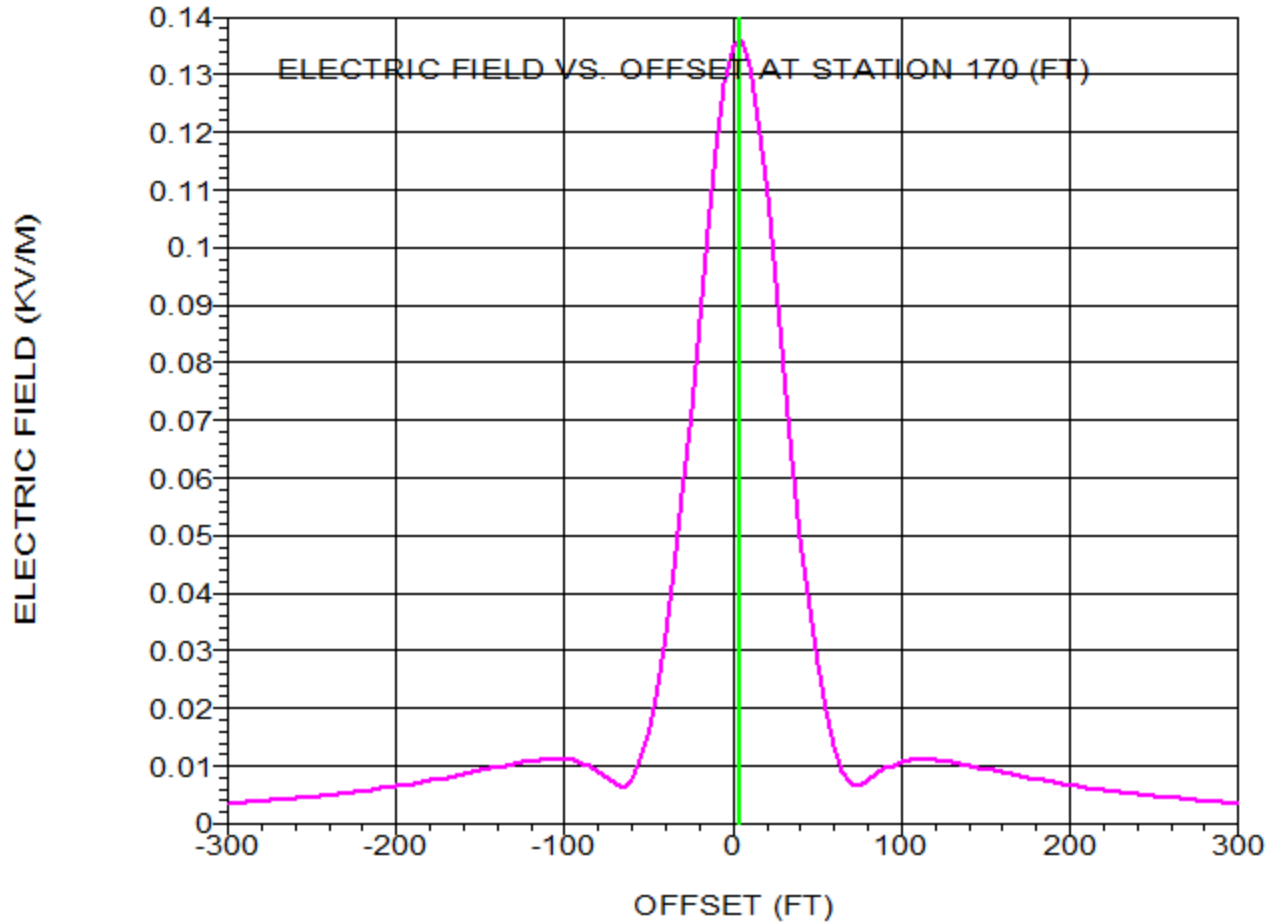
Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Wire Eqv. Diameter (in)	Wire Voltage To Gnd. (kV)
5	1	212° F	Max Sag	RS	Left	2150777.69	16931340.34	707.24	169.58	3.39	0.858 19.92
5	2	212° F	Max Sag	RS	Left	2150777.70	16931340.33	696.23	169.57	3.40	0.858 19.92
5	3	212° F	Max Sag	RS	Left	2150777.79	16931340.31	684.74	169.57	3.49	0.858 19.92

Maximum magnetic field of 6.26 (mG) found at station 169.65, offset 5.00 (ft)

Maximum electric field of 0.136 (kV/m) found at station 169.65, offset 5.00 (ft)

MAGNETIC FIELD (MG)





EMF Calculation Results:

Station	Offset	X	Y	Z	B	B	B	Phase	B	E	E	E	Phase	E	E
(ft)	(ft)	(ft)	(ft)	(ft)	Real	Img.	Angle	Res.	Real	Img.	Angle	Axis	Res.	Res.	Res.
					(mG)	(mG)	(deg)	(mG)	(kV/m)	(kV/m)	(deg)	(deg)	(deg)	(deg)	(deg)
169.65	-300.00	2150485.41	16931421.68	636.15	0.204	0.12557		31.6	0.240	0.003	0.00102	17.3	89.0	0.003	
169.65	-295.00	2150490.23	16931420.34	636.15	0.210	0.12904		31.6	0.247	0.003	0.00105	17.3	89.0	0.004	
169.65	-290.00	2150495.04	16931419.00	636.15	0.216	0.13268		31.6	0.254	0.003	0.00108	17.3	89.0	0.004	
169.65	-285.00	2150499.86	16931417.66	636.15	0.222	0.13650		31.5	0.261	0.004	0.00111	17.3	89.0	0.004	
169.65	-280.00	2150504.68	16931416.33	636.15	0.229	0.14051		31.5	0.269	0.004	0.00114	17.3	89.0	0.004	
169.65	-275.00	2150509.49	16931414.99	636.15	0.236	0.14472		31.5	0.277	0.004	0.00117	17.3	89.0	0.004	
169.65	-270.00	2150514.31	16931413.65	636.15	0.243	0.14916		31.5	0.285	0.004	0.00121	17.3	88.9	0.004	
169.65	-265.00	2150519.13	16931412.31	636.15	0.251	0.15383		31.5	0.294	0.004	0.00125	17.3	88.9	0.004	
169.65	-260.00	2150523.95	16931410.97	636.15	0.259	0.15874		31.5	0.304	0.004	0.00129	17.2	88.9	0.004	
169.65	-255.00	2150528.76	16931409.63	636.15	0.267	0.16393		31.5	0.313	0.004	0.00132	17.2	88.9	0.004	
169.65	-250.00	2150533.58	16931408.29	636.15	0.276	0.16941		31.5	0.324	0.004	0.00137	17.2	88.9	0.005	
169.65	-245.00	2150538.40	16931406.95	636.15	0.286	0.17520		31.5	0.335	0.005	0.00141	17.2	88.9	0.005	
169.65	-240.00	2150543.21	16931405.61	636.15	0.296	0.18133		31.5	0.347	0.005	0.00145	17.2	88.9	0.005	
169.65	-235.00	2150548.03	16931404.27	636.15	0.306	0.18781		31.5	0.359	0.005	0.00150	17.1	88.9	0.005	
169.65	-230.00	2150552.85	16931402.93	636.15	0.317	0.19469		31.5	0.372	0.005	0.00155	17.1	88.8	0.005	
169.65	-225.00	2150557.67	16931401.59	636.15	0.329	0.20199		31.5	0.386	0.005	0.00160	17.1	88.8	0.005	
169.65	-220.00	2150562.48	16931400.25	636.15	0.342	0.20975		31.5	0.401	0.005	0.00165	17.0	88.8	0.006	
169.65	-215.00	2150567.30	16931398.91	636.15	0.355	0.21800		31.6	0.417	0.006	0.00171	17.0	88.8	0.006	
169.65	-210.00	2150572.12	16931397.57	636.15	0.369	0.22680		31.6	0.433	0.006	0.00176	17.0	88.8	0.006	
169.65	-205.00	2150576.94	16931396.23	636.15	0.384	0.23618		31.6	0.451	0.006	0.00182	16.9	88.8	0.006	
169.65	-200.00	2150581.75	16931394.89	636.15	0.401	0.24619		31.6	0.470	0.006	0.00188	16.9	88.8	0.006	
169.65	-195.00	2150586.57	16931393.55	636.15	0.418	0.25691		31.6	0.490	0.006	0.00194	16.8	88.8	0.007	
169.65	-190.00	2150591.39	16931392.21	636.15	0.436	0.26839		31.6	0.512	0.007	0.00201	16.8	88.8	0.007	
169.65	-185.00	2150596.20	16931390.88	636.15	0.456	0.28070		31.6	0.535	0.007	0.00207	16.7	88.8	0.007	
169.65	-180.00	2150601.02	16931389.54	636.15	0.477	0.29394		31.6	0.560	0.007	0.00214	16.6	88.8	0.007	
169.65	-175.00	2150605.84	16931388.20	636.15	0.500	0.30817		31.7	0.587	0.007	0.00221	16.6	88.8	0.008	
169.65	-170.00	2150610.66	16931386.86	636.15	0.524	0.32352		31.7	0.616	0.008	0.00227	16.5	88.8	0.008	
169.65	-165.00	2150615.47	16931385.52	636.15	0.551	0.34010		31.7	0.647	0.008	0.00234	16.4	88.8	0.008	

169.65	-160.00	2150620.29	16931384.18	636.15	0.579	0.35802	31.7	0.681	0.008	0.00241	16.2	88.8	0.009
169.65	-155.00	2150625.11	16931382.84	636.15	0.610	0.37745	31.8	0.717	0.009	0.00247	16.1	88.8	0.009
169.65	-150.00	2150629.93	16931381.50	636.15	0.643	0.39854	31.8	0.756	0.009	0.00253	15.9	88.9	0.009
169.65	-145.00	2150634.74	16931380.16	636.15	0.679	0.42149	31.8	0.799	0.009	0.00258	15.8	88.9	0.010
169.65	-140.00	2150639.56	16931378.82	636.15	0.718	0.44651	31.9	0.846	0.009	0.00263	15.5	89.0	0.010
169.65	-135.00	2150644.38	16931377.48	636.15	0.761	0.47384	31.9	0.896	0.010	0.00266	15.3	89.0	0.010
169.65	-130.00	2150649.19	16931376.14	636.15	0.807	0.50377	32.0	0.951	0.010	0.00268	15.0	89.1	0.010
169.65	-125.00	2150654.01	16931374.80	636.15	0.858	0.53660	32.0	1.012	0.010	0.00268	14.6	89.2	0.011
169.65	-120.00	2150658.83	16931373.46	636.15	0.913	0.57271	32.1	1.078	0.011	0.00266	14.1	89.4	0.011
169.65	-115.00	2150663.65	16931372.12	636.15	0.974	0.61250	32.2	1.150	0.011	0.00259	13.6	89.5	0.011
169.65	-110.00	2150668.46	16931370.78	636.15	1.040	0.65648	32.3	1.230	0.011	0.00249	12.9	89.8	0.011
169.65	-105.00	2150673.28	16931369.44	636.15	1.113	0.70518	32.3	1.318	0.011	0.00232	12.0	90.1	0.011
169.65	-100.00	2150678.10	16931368.10	636.15	1.194	0.75924	32.4	1.415	0.011	0.00208	10.8	90.4	0.011
169.65	-95.00	2150682.92	16931366.77	636.15	1.283	0.81938	32.6	1.523	0.011	0.00175	9.2	90.9	0.011
169.65	-90.00	2150687.73	16931365.43	636.15	1.382	0.88644	32.7	1.642	0.010	0.00130	7.1	91.6	0.011
169.65	-85.00	2150692.55	16931364.09	636.15	1.490	0.96137	32.8	1.774	0.010	0.00077	4.4	92.5	0.010
169.65	-80.00	2150697.37	16931362.75	636.15	1.611	1.04524	33.0	1.920	0.009	0.00063	4.0	93.7	0.009
169.65	-75.00	2150702.18	16931361.41	636.15	1.744	1.13925	33.2	2.083	0.008	0.00155	11.0	95.0	0.008
169.65	-70.00	2150707.00	16931360.07	636.15	1.892	1.24473	33.3	2.265	0.006	0.00299	25.0	95.4	0.007
169.65	-65.00	2150711.82	16931358.73	636.15	2.055	1.36310	33.6	2.466	0.004	0.00490	48.2	90.0	0.006
169.65	-60.00	2150716.64	16931357.39	636.15	2.235	1.49586	33.8	2.690	0.002	0.00738	72.5	78.8	0.007
169.65	-55.00	2150721.45	16931356.05	636.15	2.434	1.64446	34.0	2.937	0.003	0.01057	71.8	75.5	0.011
169.65	-50.00	2150726.27	16931354.71	636.15	2.651	1.81015	34.3	3.210	0.008	0.01462	62.2	76.5	0.016
169.65	-45.00	2150731.09	16931353.37	636.15	2.887	1.99379	34.6	3.509	0.013	0.01971	55.8	78.0	0.024
169.65	-40.00	2150735.90	16931352.03	636.15	3.141	2.19543	35.0	3.832	0.020	0.02599	52.0	79.4	0.033
169.65	-35.00	2150740.72	16931350.69	636.15	3.410	2.41381	35.3	4.178	0.029	0.03360	49.6	80.5	0.044
169.65	-30.00	2150745.54	16931349.35	636.15	3.690	2.64574	35.6	4.540	0.038	0.04256	48.1	81.6	0.057
169.65	-25.00	2150750.36	16931348.01	636.15	3.973	2.88535	36.0	4.910	0.049	0.05275	47.3	82.7	0.072
169.65	-20.00	2150755.17	16931346.67	636.15	4.248	3.12342	36.3	5.273	0.060	0.06378	46.9	83.8	0.087
169.65	-15.00	2150759.99	16931345.33	636.15	4.503	3.34718	36.6	5.610	0.071	0.07495	46.7	84.9	0.103
169.65	-10.00	2150764.81	16931343.99	636.15	4.719	3.54089	36.9	5.900	0.080	0.08523	46.7	86.2	0.117
169.65	-5.00	2150769.63	16931342.65	636.15	4.881	3.68768	37.1	6.118	0.088	0.09342	46.7	87.6	0.128
169.65	-0.00	2150774.44	16931341.32	636.15	4.975	3.77258	37.2	6.243	0.092	0.09835	46.8	89.0	0.135
169.65	5.00	2150779.26	16931339.98	636.15	4.989	3.78601	37.2	6.263	0.093	0.09926	46.8	90.4	0.136
169.65	10.00	2150784.08	16931338.64	636.15	4.924	3.72633	37.1	6.175	0.090	0.09599	46.8	91.9	0.132
169.65	15.00	2150788.89	16931337.30	636.15	4.786	3.60036	37.0	5.989	0.084	0.08909	46.8	93.2	0.122
169.65	20.00	2150793.71	16931335.96	636.15	4.587	3.42144	36.7	5.723	0.075	0.07959	46.8	94.5	0.109
169.65	25.00	2150798.53	16931334.62	636.15	4.344	3.20617	36.4	5.399	0.064	0.06871	47.0	95.7	0.094
169.65	30.00	2150803.35	16931333.28	636.15	4.074	2.97101	36.1	5.042	0.053	0.05758	47.4	96.8	0.078
169.65	35.00	2150808.16	16931331.94	636.15	3.792	2.73003	35.8	4.672	0.042	0.04702	48.1	97.9	0.063
169.65	40.00	2150812.98	16931330.60	636.15	3.509	2.49379	35.4	4.305	0.032	0.03755	49.3	98.9	0.050
169.65	45.00	2150817.80	16931329.26	636.15	3.234	2.26937	35.1	3.951	0.024	0.02939	51.3	100.0	0.038
169.65	50.00	2150822.62	16931327.92	636.15	2.974	2.06089	34.7	3.618	0.016	0.02257	54.6	101.2	0.028
169.65	55.00	2150827.43	16931326.58	636.15	2.730	1.87022	34.4	3.310	0.010	0.01701	59.9	102.6	0.020
169.65	60.00	2150832.25	16931325.24	636.15	2.506	1.69771	34.1	3.027	0.005	0.01254	68.2	103.8	0.013
169.65	65.00	2150837.07	16931323.90	636.15	2.300	1.54276	33.9	2.770	0.002	0.00899	76.5	103.0	0.009
169.65	70.00	2150841.88	16931322.56	636.15	2.113	1.40422	33.6	2.537	0.003	0.00622	61.3	95.5	0.007
169.65	75.00	2150846.70	16931321.22	636.15	1.943	1.28066	33.4	2.327	0.006	0.00406	36.3	86.7	0.007
169.65	80.00	2150851.52	16931319.88	636.15	1.790	1.17059	33.2	2.139	0.007	0.00240	18.3	85.0	0.008
169.65	85.00	2150856.34	16931318.54	636.15	1.651	1.07254	33.0	1.969	0.009	0.00118	7.8	86.0	0.009
169.65	90.00	2150861.15	16931317.20	636.15	1.526	0.98514	32.8	1.817	0.010	0.00051	3.1	87.1	0.010
169.65	95.00	2150865.97	16931315.87	636.15	1.413	0.90712	32.7	1.679	0.010	0.00084	4.7	88.1	0.010
169.65	100.00	2150870.79	16931314.53	636.15	1.311	0.83737	32.6	1.556	0.011	0.00133	7.2	88.8	0.011
169.65	105.00	2150875.60	16931313.19	636.15	1.219	0.77488	32.4	1.444	0.011	0.00172	9.1	89.4	0.011
169.65	110.00	2150880.42	16931311.85	636.15	1.135	0.71878	32.3	1.344	0.011	0.00201	10.5	89.8	0.011
169.65	115.00	2150885.24	16931310.51	636.15	1.060	0.66831	32.2	1.253	0.011	0.00221	11.6	90.1	0.011
169.65	120.00	2150890.06	16931309.17	636.15	0.991	0.62278	32.2	1.170	0.011	0.00236	12.4	90.4	0.011
169.65	125.00	2150894.87	16931307.83	636.15	0.928	0.58163	32.1	1.095	0.010	0.00245	13.1	90.6	0.011
169.65	130.00	2150899.69	16931306.49	636.15	0.871	0.54434	32.0	1.027	0.010	0.00250	13.7	90.7	0.011
169.65	135.00	2150904.51	16931305.15	636.15	0.819	0.51047	31.9	0.965	0.010	0.00252	14.1	90.8	0.010
169.65	140.00	2150909.33	16931303.81	636.15	0.771	0.47964	31.9	0.908	0.010	0.00252	14.5	90.9	0.010
169.65	145.00	2150914.14	16931302.47	636.15	0.727	0.45151	31.8	0.856	0.009	0.00249	14.8	91.0	0.010
169.65	150.00	2150918.96	16931301.13	636.15	0.687	0.42579	31.8	0.808	0.009	0.00246	15.0	91.1	0.009
169.65	155.00	2150923.78	16931299.79	636.15	0.650	0.40222	31.7	0.764	0.009	0.00242	15.3	91.1	0.009
169.65	160.00	2150928.59	16931298.45	636.15	0.616	0.38058	31.7	0.724	0.009	0.00237	15.4	91.2	0.009
169.65	165.00	2150933.41	16931297.11	636.15	0.585	0.36067	31.7	0.687	0.008	0.00231	15.6	91.2	0.009
169.65	170.00	2150938.23	16931295.77	636.15	0.555	0.34231	31.6	0.652	0.008	0.00225	15.7	91.2	0.008
169.65	175.00	2150943.05	16931294.43	636.15	0.529	0.32536	31.6	0.621	0.008	0.00219	15.9	91.2	0.008
169.65	180.00	2150947.86	16931293.09	636.15	0.504	0.30968	31.6	0.591	0.007	0.00213	16.0	91.2	0.008
169.65	185.00	2150952.68	16931291.76	636.15	0.480	0.29514	31.6	0.564	0.007	0.00206	16.1	91.2	0.007
169.65	190.00	2150957.50	16931290.42	636.15	0.459	0.28164	31.5	0.538	0.007	0.00200	16.2	91.2	0.007
169.65	195.00	2150962.32	16931289.08	636.15	0.439	0.26910	31.5	0.515	0.007	0.00194	16.2	91.2	0.007
169.65	200.00	2150967.13	16931287.74	636.15	0.420	0.25741	31.5	0.492	0.006	0.00188	16.3	91.2	0.007
169.65	205.00	2150971.95	16931286.40	636.15	0.402	0.24650	31.5	0.472	0.006	0.00182	16.4	91.2	0.006
169.65	210.00	2150976.77	16931285.06	636.15	0.386	0.23632	31.5	0.452	0.006	0.00176	16.4	91.2	0.006
169.65	215.00	2150981.58	16931283.72	636.15	0.370	0.22679	31.5	0.434	0.006	0.00171	16.5	91.2	0.006
169.65	220.00	2150986.40	16931282.38	636.15	0.356	0.21787	31.5	0.417	0.006	0.00165	16.5	91.2	0.006
169.65	225.00	2150991.22	16931281.04	636.15	0.342	0.20950	31.5	0.401	0.005	0.00160	16.5	91.2	0.006

169.65	245.00	2151010.49	16931275.68	636.15	0.296	0.18072	31.4	0.346	0.005	0.00141	16.7	91.1	0.005
169.65	250.00	2151015.30	16931274.34	636.15	0.286	0.17453	31.4	0.335	0.005	0.00136	16.7	91.1	0.005
169.65	255.00	2151020.12	16931273.00	636.15	0.276	0.16869	31.4	0.323	0.004	0.00132	16.7	91.1	0.005
169.65	260.00	2151024.94	16931271.66	636.15	0.267	0.16316	31.4	0.313	0.004	0.00128	16.7	91.1	0.004
169.65	265.00	2151029.76	16931270.32	636.15	0.258	0.15793	31.4	0.303	0.004	0.00124	16.8	91.1	0.004
169.65	270.00	2151034.57	16931268.98	636.15	0.250	0.15297	31.4	0.293	0.004	0.00120	16.8	91.1	0.004
169.65	275.00	2151039.39	16931267.64	636.15	0.243	0.14826	31.4	0.284	0.004	0.00117	16.8	91.1	0.004
169.65	280.00	2151044.21	16931266.31	636.15	0.235	0.14380	31.4	0.276	0.004	0.00113	16.8	91.1	0.004
169.65	285.00	2151049.03	16931264.97	636.15	0.228	0.13956	31.4	0.268	0.004	0.00110	16.8	91.0	0.004
169.65	290.00	2151053.84	16931263.63	636.15	0.222	0.13553	31.4	0.260	0.004	0.00107	16.8	91.0	0.004
169.65	295.00	2151058.66	16931262.29	636.15	0.215	0.13169	31.4	0.252	0.003	0.00104	16.9	91.0	0.004
169.65	300.00	2151063.48	16931260.95	636.15	0.209	0.12803	31.4	0.245	0.003	0.00101	16.9	91.0	0.003

PLS-CADD Version 15.00x64 12:33:29 PM Friday, December 14, 2018
 Sargent & Lundy
 Project Name: 'g:\xcel\w3603_str199(w3601)-byf_tp\w3603_str199(w3601)-byf_tp.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

**** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly ****

**** User may prefer to add other specific load cases utilizing alternative Strength Factors ****

**** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER ****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
 Cross section offset for graph +/-: 300.00 (ft)
 Result interval for graph: 5.00 (ft)
 Electric field limit: 0.00 (kV/m)
 Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure W3603-72 to structure W3603-73

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
5	1	1	34.5	185.000	0	0.000
5	2	1	34.5	185.000	120	0.000
5	3	1	34.5	185.000	-120	0.000
6	1	1	34.5	185.000	0	0.858
6	2	1	34.5	185.000	120	0.858
6	3	1	34.5	185.000	-120	0.858

Calculated EMF Circuit Data For Last Point:

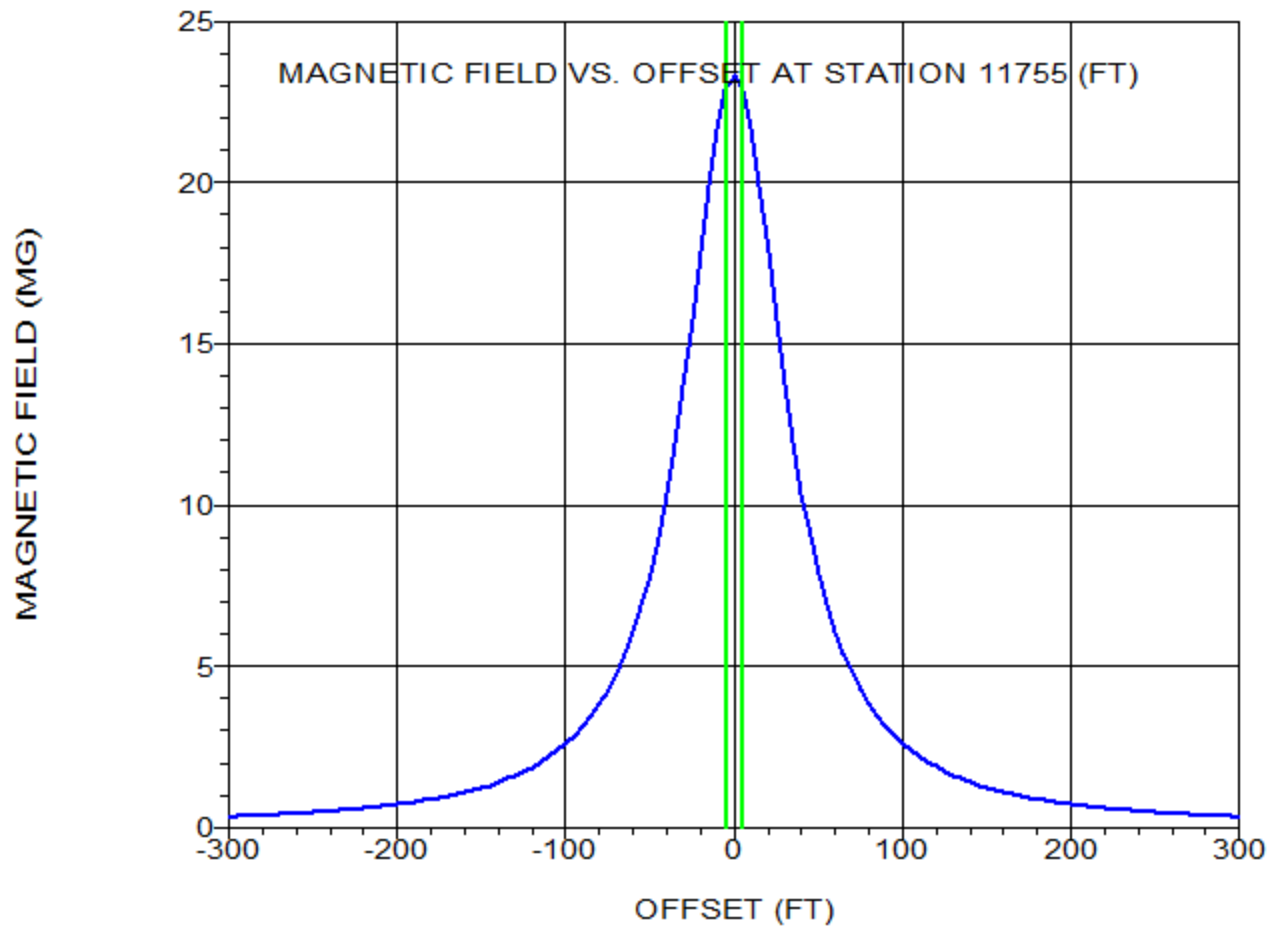
Wire station and offset are based on alignment closest to point on wire.

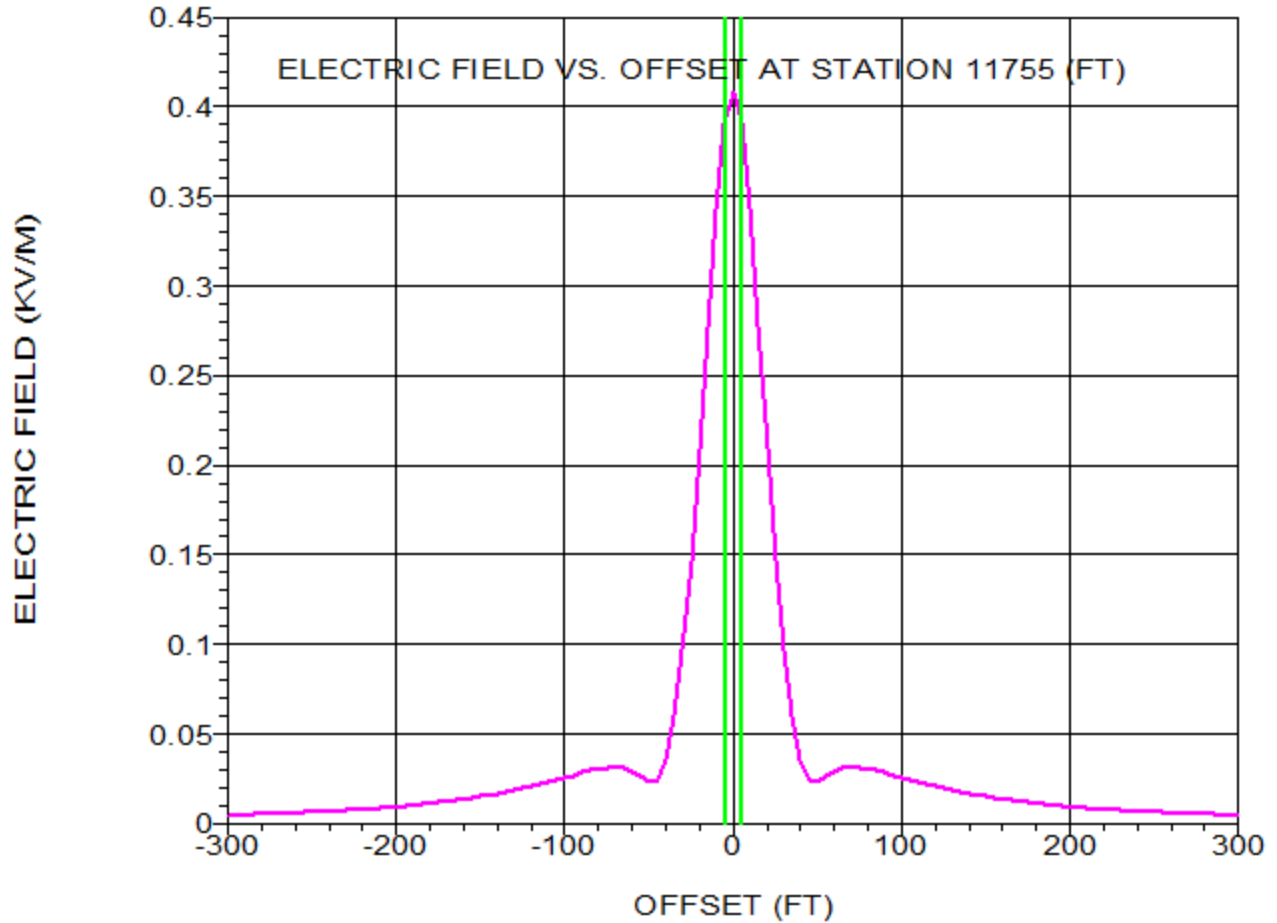
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Wire Voltage To Gnd. (kV)
5	1	212° F	Max Sag RS	Left	2165832.35	16978350.78	834.70	11754.48	4.63	0.858	19.92
5	2	212° F	Max Sag RS	Left	2165832.35	16978350.78	827.70	11754.48	4.63	0.858	19.92
5	3	212° F	Max Sag RS	Left	2165832.35	16978350.78	820.70	11754.48	4.63	0.858	19.92
6	1	212° F	Max Sag RS	Left	2165823.15	16978350.56	834.68	11754.48	-4.57	0.858	19.92
6	2	212° F	Max Sag RS	Left	2165823.15	16978350.56	827.68	11754.48	-4.57	0.858	19.92
6	3	212° F	Max Sag RS	Left	2165823.15	16978350.56	820.68	11754.48	-4.57	0.858	19.92

Maximum magnetic field of 23.28 (mG) found at station 11754.48, offset 0.00 (ft)

Maximum electric field of 0.409 (kV/m) found at station 11754.48, offset 0.00 (ft)





EMF Calculation Results:

Station	Offset	X	Y	Z	B	B B	B Phase	B rms	E	E E	E Phase	E Axis	E rms
Res.	(ft)	(ft)	(ft)	(ft)	Real	Img.	Angle	Res.	Real	Img.	Angle	Angle	
(deg)	(ft)	(ft)	(ft)	(ft)	(mG)	(mG)	(deg)	(mG)	(kV/m)	(kV/m)	(deg)		

11754.53	-300.00	2165527.80	16978343.73	789.30	0.279	0.16176	30.1	0.323	0.004	0.00102	13.3	88.9	0.004
11754.53	-295.00	2165532.80	16978343.85	789.30	0.288	0.16723	30.1	0.333	0.004	0.00105	13.3	88.9	0.005
11754.53	-290.00	2165537.80	16978343.97	789.30	0.298	0.17298	30.1	0.345	0.005	0.00108	13.3	88.9	0.005
11754.53	-285.00	2165542.79	16978344.08	789.30	0.309	0.17903	30.1	0.357	0.005	0.00112	13.3	88.9	0.005
11754.53	-280.00	2165547.79	16978344.20	789.30	0.320	0.18540	30.1	0.370	0.005	0.00115	13.2	88.8	0.005
11754.53	-275.00	2165552.79	16978344.31	789.30	0.331	0.19212	30.1	0.383	0.005	0.00119	13.2	88.8	0.005
11754.53	-270.00	2165557.79	16978344.43	789.30	0.343	0.19920	30.1	0.397	0.005	0.00123	13.2	88.8	0.005
11754.52	-265.00	2165562.79	16978344.54	789.30	0.356	0.20669	30.1	0.412	0.005	0.00128	13.2	88.8	0.006
11754.52	-260.00	2165567.79	16978344.66	789.30	0.370	0.21460	30.1	0.428	0.006	0.00132	13.2	88.8	0.006
11754.52	-255.00	2165572.79	16978344.77	789.30	0.384	0.22297	30.1	0.444	0.006	0.00137	13.2	88.8	0.006
11754.52	-250.00	2165577.78	16978344.89	789.30	0.399	0.23184	30.1	0.462	0.006	0.00142	13.2	88.7	0.006
11754.52	-245.00	2165582.78	16978345.01	789.30	0.415	0.24125	30.1	0.480	0.006	0.00147	13.2	88.7	0.006
11754.52	-240.00	2165587.78	16978345.12	789.30	0.433	0.25124	30.1	0.500	0.007	0.00152	13.2	88.7	0.007
11754.52	-235.00	2165592.78	16978345.24	789.30	0.451	0.26185	30.2	0.521	0.007	0.00158	13.1	88.7	0.007
11754.52	-230.00	2165597.78	16978345.35	789.30	0.470	0.27315	30.2	0.544	0.007	0.00164	13.1	88.6	0.007
11754.52	-225.00	2165602.78	16978345.47	789.30	0.491	0.28520	30.2	0.568	0.007	0.00171	13.1	88.6	0.008
11754.52	-220.00	2165607.78	16978345.58	789.30	0.513	0.29805	30.2	0.593	0.008	0.00177	13.1	88.6	0.008
11754.52	-215.00	2165612.78	16978345.70	789.30	0.536	0.31178	30.2	0.620	0.008	0.00185	13.1	88.6	0.008
11754.52	-210.00	2165617.77	16978345.81	789.30	0.561	0.32648	30.2	0.649	0.008	0.00192	13.0	88.5	0.009
11754.52	-205.00	2165622.77	16978345.93	789.30	0.588	0.34223	30.2	0.680	0.009	0.00200	13.0	88.5	0.009
11754.51	-200.00	2165627.77	16978346.05	789.30	0.617	0.35915	30.2	0.714	0.009	0.00209	13.0	88.5	0.009
11754.51	-195.00	2165632.77	16978346.16	789.30	0.648	0.37733	30.2	0.750	0.009	0.00218	13.0	88.5	0.010
11754.51	-190.00	2165637.77	16978346.28	789.30	0.681	0.39693	30.2	0.788	0.010	0.00227	12.9	88.4	0.010
11754.51	-185.00	2165642.77	16978346.39	789.30	0.717	0.41807	30.2	0.830	0.010	0.00237	12.9	88.4	0.011
11754.51	-180.00	2165647.77	16978346.51	789.30	0.756	0.44093	30.3	0.875	0.011	0.00248	12.8	88.4	0.011

11754.51	-175.00	2165652.76	16978346.62	789.30	0.798	0.46569	30.3	0.924	0.011	0.00259	12.8	88.3	0.012
11754.51	-170.00	2165657.76	16978346.74	789.30	0.843	0.49258	30.3	0.977	0.012	0.00271	12.8	88.3	0.012
11754.51	-165.00	2165662.76	16978346.85	789.30	0.893	0.52183	30.3	1.034	0.013	0.00283	12.7	88.3	0.013
11754.51	-160.00	2165667.76	16978346.97	789.30	0.947	0.55374	30.3	1.097	0.013	0.00296	12.6	88.3	0.014
11754.51	-155.00	2165672.76	16978347.09	789.30	1.005	0.58862	30.3	1.165	0.014	0.00310	12.6	88.2	0.014
11754.51	-150.00	2165677.76	16978347.20	789.30	1.070	0.62685	30.4	1.240	0.015	0.00325	12.5	88.2	0.015
11754.51	-145.00	2165682.76	16978347.32	789.30	1.140	0.66887	30.4	1.322	0.015	0.00340	12.4	88.2	0.016
11754.51	-140.00	2165687.76	16978347.43	789.30	1.218	0.71519	30.4	1.412	0.016	0.00356	12.3	88.2	0.017
11754.50	-135.00	2165692.75	16978347.55	789.30	1.304	0.76639	30.4	1.512	0.017	0.00372	12.2	88.1	0.018
11754.50	-130.00	2165697.75	16978347.66	789.30	1.398	0.82318	30.5	1.623	0.018	0.00388	12.1	88.1	0.019
11754.50	-125.00	2165702.75	16978347.78	789.30	1.504	0.88639	30.5	1.745	0.019	0.00405	11.9	88.1	0.020
11754.50	-120.00	2165707.75	16978347.90	789.30	1.621	0.95698	30.6	1.882	0.020	0.00422	11.7	88.1	0.021
11754.50	-115.00	2165712.75	16978348.01	789.30	1.752	1.03612	30.6	2.035	0.021	0.00437	11.5	88.1	0.022
11754.50	-110.00	2165717.75	16978348.13	789.30	1.898	1.12521	30.7	2.207	0.023	0.00451	11.2	88.1	0.023
11754.50	-105.00	2165722.75	16978348.24	789.30	2.064	1.22593	30.7	2.400	0.024	0.00463	10.9	88.2	0.024
11754.50	-100.00	2165727.74	16978348.36	789.30	2.250	1.34030	30.8	2.619	0.025	0.00471	10.5	88.3	0.026
11754.50	-95.00	2165732.74	16978348.47	789.30	2.462	1.47081	30.9	2.868	0.027	0.00472	10.0	88.4	0.027
11754.50	-90.00	2165737.74	16978348.59	789.30	2.704	1.62049	30.9	3.152	0.028	0.00464	9.4	88.5	0.028
11754.50	-85.00	2165742.74	16978348.70	789.30	2.980	1.79305	31.0	3.478	0.029	0.00442	8.6	88.7	0.030
11754.50	-80.00	2165747.74	16978348.82	789.30	3.298	1.99311	31.1	3.853	0.030	0.00401	7.6	89.1	0.030
11754.50	-75.00	2165752.74	16978348.94	789.30	3.665	2.22637	31.3	4.288	0.031	0.00332	6.1	89.5	0.031
11754.49	-70.00	2165757.74	16978349.05	789.30	4.091	2.49994	31.4	4.795	0.031	0.00230	4.2	90.2	0.031
11754.49	-65.00	2165762.74	16978349.17	789.30	4.588	2.82265	31.6	5.387	0.031	0.00138	2.6	91.1	0.031
11754.49	-60.00	2165767.73	16978349.28	789.30	5.169	3.20544	31.8	6.082	0.029	0.00310	6.0	92.5	0.029
11754.49	-55.00	2165772.73	16978349.40	789.30	5.850	3.66175	32.0	6.901	0.026	0.00706	15.1	94.1	0.027
11754.49	-50.00	2165777.73	16978349.51	789.30	6.649	4.20777	32.3	7.869	0.021	0.01315	32.4	93.8	0.024
11754.49	-45.00	2165782.73	16978349.63	789.30	7.587	4.86224	32.7	9.011	0.013	0.02216	59.5	83.0	0.024
11754.49	-40.00	2165787.73	16978349.74	789.30	8.681	5.64538	33.0	10.355	0.011	0.03527	73.3	72.3	0.036
11754.49	-35.00	2165792.73	16978349.86	789.30	9.946	6.57561	33.5	11.923	0.027	0.05403	63.4	72.4	0.060
11754.49	-30.00	2165797.73	16978349.98	789.30	11.380	7.66277	34.0	13.719	0.054	0.08016	55.8	74.5	0.097
11754.49	-25.00	2165802.72	16978350.09	789.30	12.956	8.89564	34.5	15.716	0.091	0.11509	51.7	76.8	0.147
11754.49	-20.00	2165807.72	16978350.21	789.30	14.605	10.22379	35.0	17.827	0.135	0.15877	49.6	79.0	0.208
11754.49	-15.00	2165812.72	16978350.32	789.30	16.196	11.54020	35.5	19.887	0.183	0.20810	48.7	81.4	0.277
11754.49	-10.00	2165817.72	16978350.44	789.30	17.549	12.68136	35.9	21.651	0.228	0.25571	48.3	84.1	0.343
11754.48	-5.00	2165822.72	16978350.55	789.30	18.465	13.46318	36.1	22.852	0.261	0.29099	48.1	87.0	0.391
11754.48	0.00	2165827.72	16978350.67	789.30	18.791	13.74293	36.2	23.280	0.273	0.30417	48.1	90.0	0.409
11754.48	5.00	2165832.72	16978350.78	789.30	18.470	13.46789	36.1	22.859	0.261	0.29127	48.1	93.0	0.391
11754.48	10.00	2165837.72	16978350.90	789.30	17.559	12.69023	35.9	21.665	0.229	0.25620	48.3	95.9	0.343
11754.48	15.00	2165842.71	16978351.02	789.30	16.210	11.55201	35.5	19.905	0.184	0.20868	48.6	98.5	0.278
11754.48	20.00	2165847.71	16978351.13	789.30	14.621	10.23696	35.0	17.848	0.136	0.15934	49.6	100.9	0.209
11754.48	25.00	2165852.71	16978351.25	789.30	12.973	8.90876	34.5	15.737	0.091	0.11558	51.7	103.2	0.147
11754.48	30.00	2165857.71	16978351.36	789.30	11.396	7.67493	34.0	13.739	0.055	0.08055	55.7	105.4	0.097
11754.48	35.00	2165862.71	16978351.48	789.30	9.960	6.58638	33.5	11.941	0.027	0.05432	63.2	107.6	0.060
11754.48	40.00	2165867.71	16978351.59	789.30	8.694	5.65467	33.0	10.371	0.011	0.03548	73.3	107.7	0.036
11754.48	45.00	2165872.71	16978351.71	789.30	7.598	4.87014	32.7	9.025	0.013	0.02231	59.9	97.3	0.024
11754.48	50.00	2165877.70	16978351.82	789.30	6.659	4.21443	32.3	7.880	0.021	0.01326	32.8	86.3	0.024
11754.48	55.00	2165882.70	16978351.94	789.30	5.858	3.66737	32.0	6.911	0.026	0.00714	15.4	85.9	0.027
11754.47	60.00	2165887.70	16978352.06	789.30	5.176	3.21018	31.8	6.091	0.029	0.00315	6.2	87.5	0.029
11754.47	65.00	2165892.70	16978352.17	789.30	4.594	2.82666	31.6	5.394	0.031	0.00138	2.6	88.8	0.031
11754.47	70.00	2165897.70	16978352.29	789.30	4.097	2.50335	31.4	4.801	0.031	0.00227	4.2	89.8	0.031
11754.47	75.00	2165902.70	16978352.40	789.30	3.670	2.22928	31.3	4.294	0.031	0.00330	6.1	90.5	0.031
11754.47	80.00	2165907.70	16978352.52	789.30	3.302	1.99561	31.1	3.858	0.030	0.00399	7.5	90.9	0.030
11754.47	85.00	2165912.70	16978352.63	789.30	2.983	1.79521	31.0	3.482	0.029	0.00441	8.6	91.3	0.029
11754.47	90.00	2165917.69	16978352.75	789.30	2.707	1.62236	30.9	3.156	0.028	0.00463	9.4	91.5	0.028
11754.47	95.00	2165922.69	16978352.86	789.30	2.465	1.47244	30.9	2.871	0.027	0.00471	10.0	91.6	0.027
11754.47	100.00	2165927.69	16978352.98	789.30	2.253	1.34173	30.8	2.622	0.025	0.00470	10.5	91.7	0.026
11754.47	105.00	2165932.69	16978353.10	789.30	2.066	1.22718	30.7	2.403	0.024	0.00463	10.9	91.8	0.024
11754.47	110.00	2165937.69	16978353.21	789.30	1.900	1.12632	30.7	2.209	0.023	0.00451	11.2	91.9	0.023
11754.47	115.00	2165942.69	16978353.33	789.30	1.753	1.03711	30.6	2.037	0.022	0.00437	11.5	91.9	0.022
11754.47	120.00	2165947.69	16978353.44	789.30	1.622	0.95786	30.6	1.884	0.020	0.00421	11.7	91.9	0.021
11754.46	125.00	2165952.68	16978353.56	789.30	1.505	0.88717	30.5	1.747	0.019	0.00405	11.9	91.9	0.020
11754.46	130.00	2165957.68	16978353.67	789.30	1.400	0.82389	30.5	1.624	0.018	0.00388	12.0	91.9	0.019
11754.46	135.00	2165962.68	16978353.79	789.30	1.305	0.76703	30.5	1.514	0.017	0.00372	12.2	91.9	0.018
11754.46	140.00	2165967.68	16978353.90	789.30	1.219	0.71576	30.4	1.414	0.016	0.00356	12.3	91.8	0.017
11754.46	145.00	2165972.68	16978354.02	789.30	1.141	0.66939	30.4	1.323	0.015	0.00340	12.4	91.8	0.016
11754.46	150.00	2165977.68	16978354.14	789.30	1.071	0.62733	30.4	1.241	0.015	0.00325	12.5	91.8	0.015
11754.46	155.00	2165982.68	16978354.25	789.30	1.006	0.58905	30.3	1.166	0.014	0.00310	12.6	91.8	0.014
11754.46	160.00	2165987.68	16978354.37	789.30	0.947	0.55413	30.3	1.097	0.013	0.00296	12.6	91.7	0.014
11754.46	165.00	2165992.67	16978354.48	789.30	0.893	0.52220	30.3	1.035	0.013	0.00283	12.7	91.7	0.013
11754.46	170.00	2165997.67	16978354.60	789.30	0.844	0.49291	30.3	0.977	0.012	0.00271	12.7	91.7	0.012
11754.46	175.00	2166002.67	16978354.71	789.30	0.798	0.46600	30.3	0.924	0.011	0.00259	12.8	91.7	0.012
11754.46	180.00	2166007.67	16978354.83	789.30	0.756	0.44121	30.3	0.876	0.011	0.00248	12.8	91.6	0.011
11754.46	185.00	2166012.67	16978354.94	789.30	0.717	0.41833	30.2	0.830	0.010	0.00237	12.9	91.6	0.011
11754.45	190.00	2166017.67	16978355.06	789.30	0.681	0.39717	30.2	0.789	0.010	0.00227	12.9	91.6	0.010
11754.45	195.00	2166022.67	16978355.18	789.30	0.648	0.37756	30.2	0.750	0.009	0.00218	12.9	91.5	0.010
11754.45	200.00	2166027.66	16978355.29	789.30	0.617	0.35936	30.2	0.714	0.009	0.00209	13.0	91.5	0.009
11754.45	205.00	2166032.66	16978355.41	789.30	0.588	0.34243	30.2	0.681	0.009	0.00200			

11754.45	230.00	2166057.66	16978355.98	789.30	0.470	0.27329	30.2	0.544	0.007	0.00164	13.1	91.4	0.007
11754.45	235.00	2166062.66	16978356.10	789.30	0.451	0.26198	30.2	0.522	0.007	0.00158	13.1	91.3	0.007
11754.45	240.00	2166067.65	16978356.22	789.30	0.433	0.25136	30.1	0.500	0.007	0.00152	13.1	91.3	0.007
11754.45	245.00	2166072.65	16978356.33	789.30	0.416	0.24136	30.1	0.481	0.006	0.00147	13.2	91.3	0.006
11754.45	250.00	2166077.65	16978356.45	789.30	0.400	0.23195	30.1	0.462	0.006	0.00142	13.2	91.3	0.006
11754.44	255.00	2166082.65	16978356.56	789.30	0.384	0.22308	30.1	0.444	0.006	0.00137	13.2	91.2	0.006
11754.44	260.00	2166087.65	16978356.68	789.30	0.370	0.21470	30.1	0.428	0.006	0.00132	13.2	91.2	0.006
11754.44	265.00	2166092.65	16978356.79	789.30	0.356	0.20678	30.1	0.412	0.005	0.00128	13.2	91.2	0.006
11754.44	270.00	2166097.65	16978356.91	789.30	0.344	0.19929	30.1	0.397	0.005	0.00123	13.2	91.2	0.005
11754.44	275.00	2166102.64	16978357.02	789.30	0.331	0.19220	30.1	0.383	0.005	0.00119	13.2	91.2	0.005
11754.44	280.00	2166107.64	16978357.14	789.30	0.320	0.18548	30.1	0.370	0.005	0.00115	13.2	91.2	0.005
11754.44	285.00	2166112.64	16978357.26	789.30	0.309	0.17910	30.1	0.357	0.005	0.00112	13.3	91.1	0.005
11754.44	290.00	2166117.64	16978357.37	789.30	0.298	0.17305	30.1	0.345	0.005	0.00108	13.3	91.1	0.005
11754.44	295.00	2166122.64	16978357.49	789.30	0.289	0.16730	30.1	0.334	0.004	0.00105	13.3	91.1	0.005
11754.44	300.00	2166127.64	16978357.60	789.30	0.279	0.16183	30.1	0.323	0.004	0.00102	13.3	91.1	0.004

PLS-CADD Version 15.00x64 12:32:25 PM Friday, December 14, 2018
 Sargent & Lundy
 Project Name: 'g:\xcel\w3603_str199(w3601)-byf_tp\w3603_str199(w3601)-byf_tp.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

***** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly *****

***** User may prefer to add other specific load cases utilizing alternative Strength Factors *****

***** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER *****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
 Cross section offset for graph +/-: 300.00 (ft)
 Result interval for graph: 5.00 (ft)
 Electric field limit: 0.00 (kV/m)
 Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure WXXXX-Tap to structure WXXXX-Tap 2

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
6	1	1	34.5	185.000	0	0.858
6	2	1	34.5	185.000	120	0.858
6	3	1	34.5	185.000	-120	0.858

Calculated EMF Circuit Data For Last Point:

Wire station and offset are based on alignment closest to point on wire.

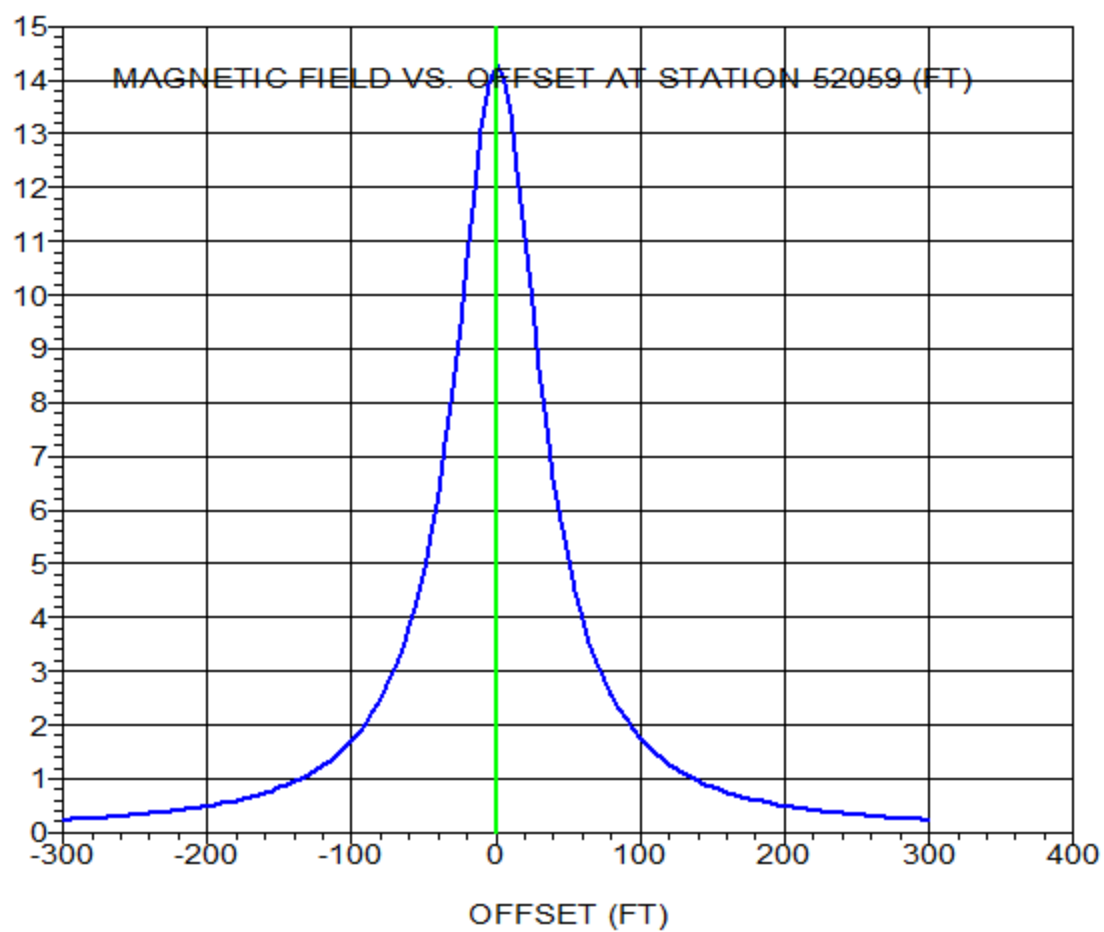
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

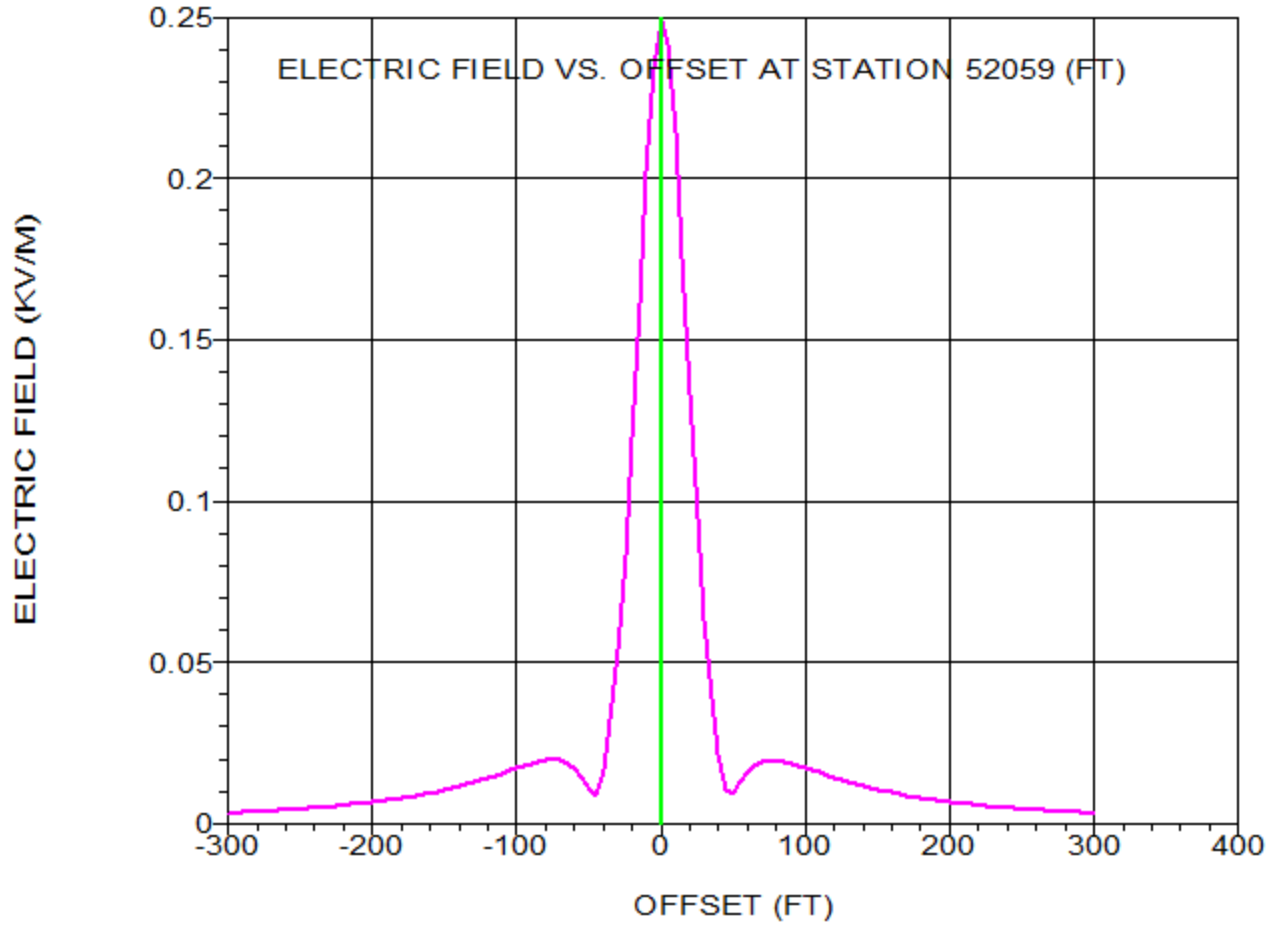
Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Wire Voltage To Gnd. (kV)	
6	1	212° F	Max Sag	RS	Left	2174376.08	17012236.48	887.49	52059.07	0.74	0.858	19.92
6	2	212° F	Max Sag	RS	Left	2174376.13	17012236.48	878.01	52059.07	0.78	0.858	19.92
6	3	212° F	Max Sag	RS	Left	2174376.16	17012236.47	868.53	52059.07	0.82	0.858	19.92

Maximum magnetic field of 14.29 (mG) found at station 52059.09, offset 0.00 (ft)

Maximum electric field of 0.249 (kV/m) found at station 52059.09, offset 0.00 (ft)

MAGNETIC FIELD (MG)





EMF Calculation Results:

Station	Offset	X	Y	Z	B Real	B B Img.	B B Phase Angle	B rms Res.	E Real	E E Img.	E E Phase Angle	E Axis Angle	E rms
Res.	(ft)	(ft)	(ft)	(ft)	(mG)	(mG)	(deg)	(mG)	(kV/m)	(kV/m)	(deg)		
(deg)	(kV/m)												

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52059.09	-300.00	2174075.43	17012228.98	836.32	0.200	0.11608	30.2	0.231	0.003	0.00100	18.4	88.9	0.003
52059.09	-295.00	2174080.43	17012229.11	836.32	0.206	0.11976	30.2	0.238	0.003	0.00103	18.4	88.9	0.003
52059.09	-290.00	2174085.43	17012229.23	836.32	0.213	0.12362	30.2	0.246	0.003	0.00107	18.4	88.9	0.003
52059.09	-285.00	2174090.43	17012229.36	836.32	0.219	0.12768	30.2	0.254	0.003	0.00110	18.4	88.9	0.003
52059.09	-280.00	2174095.43	17012229.48	836.32	0.227	0.13195	30.2	0.262	0.003	0.00114	18.4	88.9	0.004
52059.09	-275.00	2174100.43	17012229.61	836.32	0.234	0.13646	30.2	0.271	0.004	0.00118	18.4	88.8	0.004
52059.09	-270.00	2174105.42	17012229.73	836.32	0.243	0.14121	30.2	0.281	0.004	0.00122	18.4	88.8	0.004
52059.09	-265.00	2174110.42	17012229.86	836.32	0.251	0.14622	30.2	0.291	0.004	0.00126	18.4	88.8	0.004
52059.09	-260.00	2174115.42	17012229.98	836.32	0.260	0.15152	30.2	0.301	0.004	0.00130	18.4	88.8	0.004
52059.09	-255.00	2174120.42	17012230.11	836.32	0.270	0.15712	30.2	0.312	0.004	0.00135	18.4	88.8	0.004
52059.09	-250.00	2174125.42	17012230.23	836.32	0.280	0.16305	30.2	0.324	0.004	0.00140	18.4	88.8	0.004
52059.09	-245.00	2174130.42	17012230.36	836.32	0.291	0.16933	30.2	0.336	0.004	0.00145	18.4	88.7	0.005
52059.09	-240.00	2174135.41	17012230.48	836.32	0.302	0.17601	30.2	0.349	0.005	0.00151	18.4	88.7	0.005
52059.09	-235.00	2174140.41	17012230.61	836.32	0.314	0.18309	30.3	0.363	0.005	0.00157	18.4	88.7	0.005
52059.09	-230.00	2174145.41	17012230.73	836.32	0.327	0.19063	30.3	0.378	0.005	0.00163	18.4	88.7	0.005
52059.09	-225.00	2174150.41	17012230.86	836.32	0.340	0.19866	30.3	0.394	0.005	0.00169	18.4	88.6	0.005
52059.09	-220.00	2174155.41	17012230.98	836.32	0.355	0.20722	30.3	0.411	0.005	0.00176	18.4	88.6	0.006
52059.09	-215.00	2174160.41	17012231.10	836.32	0.370	0.21636	30.3	0.429	0.006	0.00183	18.4	88.6	0.006
52059.09	-210.00	2174165.41	17012231.23	836.32	0.387	0.22614	30.3	0.448	0.006	0.00191	18.4	88.6	0.006
52059.09	-205.00	2174170.40	17012231.35	836.32	0.405	0.23661	30.3	0.469	0.006	0.00199	18.4	88.6	0.006
52059.09	-200.00	2174175.40	17012231.48	836.32	0.424	0.24784	30.3	0.491	0.006	0.00208	18.4	88.5	0.007
52059.09	-195.00	2174180.40	17012231.60	836.32	0.444	0.25991	30.3	0.514	0.007	0.00217	18.4	88.5	0.007
52059.09	-190.00	2174185.40	17012231.73	836.32	0.466	0.27290	30.4	0.540	0.007	0.00226	18.4	88.5	0.007
52059.09	-185.00	2174190.40	17012231.85	836.32	0.489	0.28691	30.4	0.567	0.007	0.00237	18.4	88.5	0.008
52059.09	-180.00	2174195.40	17012231.98	836.32	0.515	0.30203	30.4	0.597	0.007	0.00248	18.4	88.4	0.008
52059.09	-175.00	2174200.39	17012232.10	836.32	0.542	0.31841	30.4	0.629	0.008	0.00259	18.4	88.4	0.008

52059.09	-170.00	2174205.39	17012232.23	836.32	0.572	0.33616	30.4	0.663	0.008	0.00272	18.4	88.4	0.009
52059.09	-165.00	2174210.39	17012232.35	836.32	0.604	0.35546	30.5	0.701	0.009	0.00285	18.4	88.4	0.009
52059.09	-160.00	2174215.39	17012232.48	836.32	0.639	0.37647	30.5	0.742	0.009	0.00299	18.4	88.3	0.009
52059.09	-155.00	2174220.39	17012232.60	836.32	0.678	0.39942	30.5	0.786	0.009	0.00314	18.4	88.3	0.010
52059.09	-150.00	2174225.39	17012232.73	836.32	0.719	0.42454	30.6	0.835	0.010	0.00329	18.3	88.3	0.010
52059.09	-145.00	2174230.39	17012232.85	836.32	0.765	0.45210	30.6	0.889	0.010	0.00346	18.3	88.3	0.011
52059.09	-140.00	2174235.38	17012232.98	836.32	0.815	0.48243	30.6	0.947	0.011	0.00364	18.3	88.3	0.012
52059.09	-135.00	2174240.38	17012233.10	836.32	0.870	0.51590	30.7	1.012	0.012	0.00382	18.3	88.2	0.012
52059.09	-130.00	2174245.38	17012233.23	836.32	0.931	0.55296	30.7	1.083	0.012	0.00402	18.3	88.2	0.013
52059.09	-125.00	2174250.38	17012233.35	836.32	0.998	0.59411	30.8	1.162	0.013	0.00422	18.2	88.2	0.013
52059.09	-120.00	2174255.38	17012233.48	836.32	1.073	0.63997	30.8	1.249	0.013	0.00443	18.2	88.3	0.014
52059.09	-115.00	2174260.38	17012233.60	836.32	1.156	0.69126	30.9	1.347	0.014	0.00464	18.1	88.3	0.015
52059.09	-110.00	2174265.37	17012233.72	836.32	1.249	0.74884	30.9	1.456	0.015	0.00486	18.1	88.3	0.016
52059.09	-105.00	2174270.37	17012233.85	836.32	1.353	0.81374	31.0	1.579	0.016	0.00507	18.0	88.4	0.016
52059.09	-100.00	2174275.37	17012233.97	836.32	1.470	0.88721	31.1	1.717	0.016	0.00527	17.8	88.5	0.017
52059.09	-95.00	2174280.37	17012234.10	836.32	1.602	0.97076	31.2	1.873	0.017	0.00544	17.7	88.6	0.018
52059.09	-90.00	2174285.37	17012234.22	836.32	1.752	1.06620	31.3	2.051	0.018	0.00557	17.4	88.8	0.019
52059.09	-85.00	2174290.37	17012234.35	836.32	1.922	1.17577	31.5	2.253	0.018	0.00563	17.1	89.1	0.019
52059.09	-80.00	2174295.36	17012234.47	836.32	2.116	1.30220	31.6	2.485	0.019	0.00559	16.6	89.5	0.020
52059.09	-75.00	2174300.36	17012234.60	836.32	2.339	1.44887	31.8	2.751	0.019	0.00538	15.8	90.1	0.020
52059.09	-70.00	2174305.36	17012234.72	836.32	2.596	1.61992	32.0	3.060	0.019	0.00495	14.7	91.0	0.019
52059.09	-65.00	2174310.36	17012234.85	836.32	2.892	1.82048	32.2	3.417	0.018	0.00417	12.9	92.3	0.019
52059.09	-60.00	2174315.36	17012234.97	836.32	3.234	2.05683	32.5	3.833	0.017	0.00297	10.1	94.5	0.017
52059.09	-55.00	2174320.36	17012235.10	836.32	3.632	2.33668	32.8	4.319	0.014	0.00173	6.9	98.2	0.014
52059.09	-50.00	2174325.36	17012235.22	836.32	4.095	2.66927	33.1	4.888	0.011	0.00348	18.2	103.8	0.011
52059.09	-45.00	2174330.35	17012235.35	836.32	4.631	3.06538	33.5	5.554	0.006	0.00817	53.6	78.4	0.008
52059.09	-40.00	2174335.35	17012235.47	836.32	5.252	3.53695	34.0	6.332	0.008	0.01537	62.6	64.0	0.017
52059.09	-35.00	2174340.35	17012235.60	836.32	5.964	4.09570	34.5	7.235	0.019	0.02582	53.2	69.7	0.032
52059.09	-30.00	2174345.35	17012235.72	836.32	6.769	4.75024	35.1	8.269	0.036	0.04051	48.5	73.6	0.054
52059.09	-25.00	2174350.35	17012235.85	836.32	7.658	5.50025	35.7	9.429	0.057	0.06037	46.5	76.3	0.083
52059.09	-20.00	2174355.35	17012235.97	836.32	8.602	6.32670	36.3	10.678	0.083	0.08573	45.8	78.7	0.120
52059.09	-15.00	2174360.34	17012236.09	836.32	9.541	7.17878	37.0	11.940	0.112	0.11537	45.8	81.0	0.161
52059.09	-10.00	2174365.34	17012236.22	836.32	10.379	7.96307	37.5	13.082	0.140	0.14555	46.1	83.5	0.202
52059.09	-5.00	2174370.34	17012236.34	836.32	10.990	8.54928	37.9	13.924	0.162	0.16980	46.4	86.4	0.235
52059.09	0.00	2174375.34	17012236.47	836.32	11.256	8.80808	38.0	14.293	0.172	0.18103	46.5	89.5	0.249
52059.09	5.00	2174380.34	17012236.59	836.32	11.116	8.67277	38.0	14.099	0.167	0.17534	46.5	92.6	0.242
52059.09	10.00	2174385.34	17012236.72	836.32	10.602	8.17879	37.6	13.390	0.148	0.15478	46.2	95.6	0.214
52059.09	15.00	2174390.34	17012236.84	836.32	9.820	7.44215	37.2	12.322	0.122	0.12583	45.9	98.2	0.175
52059.09	20.00	2174395.33	17012236.97	836.32	8.900	6.59878	36.6	11.079	0.093	0.09551	45.7	100.5	0.133
52059.09	25.00	2174400.33	17012237.09	836.32	7.948	5.75600	35.9	9.814	0.066	0.06852	46.1	102.8	0.095
52059.09	30.00	2174405.33	17012237.22	836.32	7.037	4.97764	35.3	8.619	0.043	0.04683	47.6	105.3	0.063
52059.09	35.00	2174410.33	17012237.34	836.32	6.203	4.29142	34.7	7.542	0.025	0.03050	51.1	108.6	0.039
52059.09	40.00	2174415.33	17012237.47	836.32	5.461	3.70238	34.1	6.597	0.011	0.01873	58.7	113.5	0.022
52059.09	45.00	2174420.33	17012237.59	836.32	4.812	3.20395	33.7	5.781	0.005	0.01053	63.9	116.0	0.011
52059.09	50.00	2174425.32	17012237.72	836.32	4.250	2.78495	33.2	5.081	0.009	0.00501	30.0	76.2	0.009
52059.09	55.00	2174430.32	17012237.84	836.32	3.765	2.43327	32.9	4.483	0.013	0.00190	8.4	79.8	0.013
52059.09	60.00	2174435.32	17012237.97	836.32	3.348	2.13766	32.6	3.972	0.016	0.00232	8.4	84.3	0.016
52059.09	65.00	2174440.32	17012238.09	836.32	2.989	1.88837	32.3	3.535	0.017	0.00364	11.8	87.0	0.018
52059.09	70.00	2174445.32	17012238.22	836.32	2.679	1.67720	32.1	3.160	0.018	0.00456	14.0	88.6	0.019
52059.09	75.00	2174450.32	17012238.34	836.32	2.411	1.49742	31.8	2.838	0.019	0.00512	15.3	89.6	0.019
52059.09	80.00	2174455.32	17012238.47	836.32	2.178	1.34355	31.7	2.559	0.019	0.00540	16.2	90.3	0.019
52059.09	85.00	2174460.31	17012238.59	836.32	1.975	1.21116	31.5	2.317	0.018	0.00551	16.8	90.7	0.019
52059.09	90.00	2174465.31	17012238.71	836.32	1.798	1.09663	31.4	2.106	0.018	0.00549	17.2	91.1	0.019
52059.09	95.00	2174470.31	17012238.84	836.32	1.642	0.99704	31.3	1.921	0.017	0.00539	17.5	91.3	0.018
52059.09	100.00	2174475.31	17012238.96	836.32	1.505	0.91002	31.2	1.759	0.016	0.00524	17.7	91.4	0.017
52059.09	105.00	2174480.31	17012239.09	836.32	1.384	0.83360	31.1	1.616	0.016	0.00505	17.8	91.6	0.016
52059.09	110.00	2174485.31	17012239.21	836.32	1.276	0.76621	31.0	1.489	0.015	0.00485	17.9	91.6	0.016
52059.09	115.00	2174490.30	17012239.34	836.32	1.180	0.70650	30.9	1.376	0.014	0.00464	18.0	91.7	0.015
52059.09	120.00	2174495.30	17012239.46	836.32	1.094	0.65339	30.8	1.275	0.014	0.00443	18.1	91.7	0.014
52059.09	125.00	2174500.30	17012239.59	836.32	1.017	0.60597	30.8	1.184	0.013	0.00422	18.1	91.7	0.014
52059.09	130.00	2174505.30	17012239.71	836.32	0.948	0.56347	30.7	1.103	0.012	0.00402	18.2	91.7	0.013
52059.09	135.00	2174510.30	17012239.84	836.32	0.885	0.52525	30.7	1.029	0.012	0.00383	18.2	91.7	0.012
52059.09	140.00	2174515.30	17012239.96	836.32	0.829	0.49076	30.6	0.963	0.011	0.00364	18.2	91.7	0.012
52059.09	145.00	2174520.29	17012240.09	836.32	0.777	0.45954	30.6	0.903	0.011	0.00347	18.2	91.7	0.011
52059.09	150.00	2174525.29	17012240.21	836.32	0.730	0.43121	30.6	0.848	0.010	0.00330	18.3	91.7	0.011
52059.09	155.00	2174530.29	17012240.34	836.32	0.688	0.40541	30.5	0.798	0.010	0.00314	18.3	91.7	0.010
52059.09	160.00	2174535.29	17012240.46	836.32	0.648	0.38186	30.5	0.753	0.009	0.00299	18.3	91.7	0.010
52059.09	165.00	2174540.29	17012240.59	836.32	0.613	0.36031	30.5	0.711	0.009	0.00285	18.3	91.6	0.009
52059.09	170.00	2174545.29	17012240.71	836.32	0.580	0.34055	30.4	0.672	0.008	0.00272	18.3	91.6	0.009
52059.09	175.00	2174550.29	17012240.84	836.32	0.549	0.32238	30.4	0.637	0.008	0.00260	18.3	91.6	0.008
52059.09	180.00	2174555.28	17012240.96	836.32	0.521	0.30563	30.4	0.604	0.007	0.00248	18.3	91.6	0.008
52059.09	185.00	2174560.28	17012241.08	836.32	0.495	0.29018	30.4	0.574	0.007	0.00237	18.3	91.5	0.008
52059.09	190.00	2174565.28	17012241.21	836.32	0.471	0.27588	30.4	0.546	0.007	0.00226	18.3	91.5	0.007
52059.09	195.00	2174570.28	17012241.33	836.32	0.449	0.26263	30.3	0.520	0.007	0.00217	18.3	91.5	0.007
52059.09	200.00	2174575.28	17012241.46	836.32	0.428	0.25032	30.3	0.496	0.006	0.00207	18.3	91.5	0.007
52059.09	205.00	2174580.28	17012241.58	836.32	0.409	0.23888	30.3	0.473	0.006	0.00199	18.3	91.4	0.006
52059.09	210.00	2174585.27	17012241.71	836.32	0.391	0.22821	30.3	0.452	0.006	0.00191	18.3	91.	

52059.09	235.00	2174610.27	17012242.33	836.32	0.316	0.18446	30.2	0.366	0.005	0.00156	18.3	91.3	0.005
52059.09	240.00	2174615.27	17012242.46	836.32	0.304	0.17727	30.2	0.352	0.005	0.00150	18.3	91.3	0.005
52059.09	245.00	2174620.26	17012242.58	836.32	0.293	0.17051	30.2	0.339	0.004	0.00145	18.3	91.3	0.005
52059.09	250.00	2174625.26	17012242.71	836.32	0.282	0.16414	30.2	0.326	0.004	0.00140	18.3	91.3	0.004
52059.09	255.00	2174630.26	17012242.83	836.32	0.272	0.15813	30.2	0.314	0.004	0.00135	18.3	91.2	0.004
52059.09	260.00	2174635.26	17012242.96	836.32	0.262	0.15246	30.2	0.303	0.004	0.00130	18.3	91.2	0.004
52059.09	265.00	2174640.26	17012243.08	836.32	0.253	0.14710	30.2	0.293	0.004	0.00125	18.3	91.2	0.004
52059.09	270.00	2174645.26	17012243.21	836.32	0.244	0.14203	30.2	0.283	0.004	0.00121	18.3	91.2	0.004
52059.09	275.00	2174650.25	17012243.33	836.32	0.236	0.13723	30.2	0.273	0.004	0.00117	18.3	91.2	0.004
52059.09	280.00	2174655.25	17012243.46	836.32	0.228	0.13268	30.2	0.264	0.003	0.00113	18.3	91.1	0.004
52059.09	285.00	2174660.25	17012243.58	836.32	0.221	0.12836	30.2	0.255	0.003	0.00109	18.3	91.1	0.003
52059.09	290.00	2174665.25	17012243.70	836.32	0.214	0.12426	30.2	0.247	0.003	0.00106	18.2	91.1	0.003
52059.09	295.00	2174670.25	17012243.83	836.32	0.207	0.12036	30.1	0.240	0.003	0.00103	18.2	91.1	0.003
52059.09	300.00	2174675.25	17012243.95	836.32	0.201	0.11666	30.1	0.232	0.003	0.00099	18.2	91.1	0.003

PLS-CADD Version 15.00x64 12:36:48 PM Friday, December 14, 2018
Sargent & Lundy
Project Name: 'g:\xcel\w3603_str199(w3601)-byf_tp\w3603_str199(w3601)-byf_tp.DON'

Criteria Notes:

***** PLEASE NOTE - Designer/Engineer is expected to review the weather conditions before starting the project design.

***** Some weather conditions need to be modified.

***** Per Rule 277, the responsible engineer should decide what "proper allowance" is for Rules 250C and 250D and modify load cases accordingly *****

***** User may prefer to add other specific load cases utilizing alternative Strength Factors *****

***** Coordination of Load Factors, Strength Factors, and Component strength properties is the responsibility of the RESPONSIBLE ENGINEER *****

EMF Calculation Notes:

- 1) All calculations based on the EPRI Red Book methods (2nd Edition, 1982 - infinite straight wire with flat earth approximation).
- 2) These approximations are only valid for low frequency (50-60Hz) AC transmission lines.
- 3) Bundles are modeled with an equivalent conductor as per EPRI Red Book 8.3.1.
- 4) The effects of earth return currents (earth resistivity) are ignored when calculating the magnetic field.
- 5) Wire position is determined by the currently displayed weather case.
- 6) Wire height used is the height of the wire where the target point is projected upon it.
- 7) All calculations assume ground is flat with same elevation as that of centerline.

Meter height above centerline ground: 3.00 (ft)
Cross section offset for graph +/-: 300.00 (ft)
Result interval for graph: 5.00 (ft)
Electric field limit: 0.00 (kV/m)
Magnetic field limit: 0.00 (mG)

EMF calculation includes only wires going from structure W3603-175 to structure W3603-176

EMF Circuit Data:

Set #	Phase #	Conductors Per Phase	Voltage Ph-Ph (kV)	Current (Amps)	Phase Angle (deg)	Bundle Diameter (in)
5	1	1	34.5	185.000	0	0.000
5	2	1	34.5	185.000	120	0.000
5	3	1	34.5	185.000	-120	0.000

Calculated EMF Circuit Data For Last Point:

Wire station and offset are based on alignment closest to point on wire.

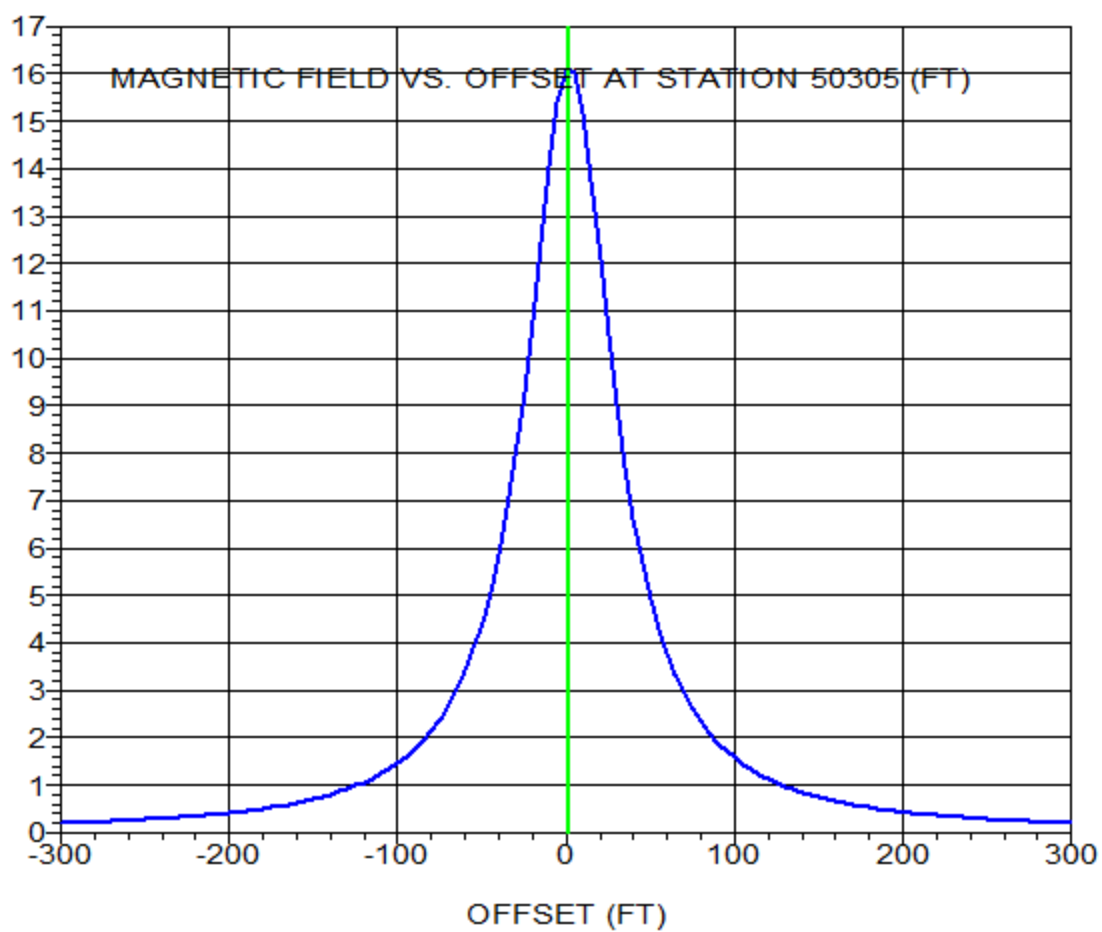
In the case of wires that are not parallel, this may result in different stations for the wires and centerline.

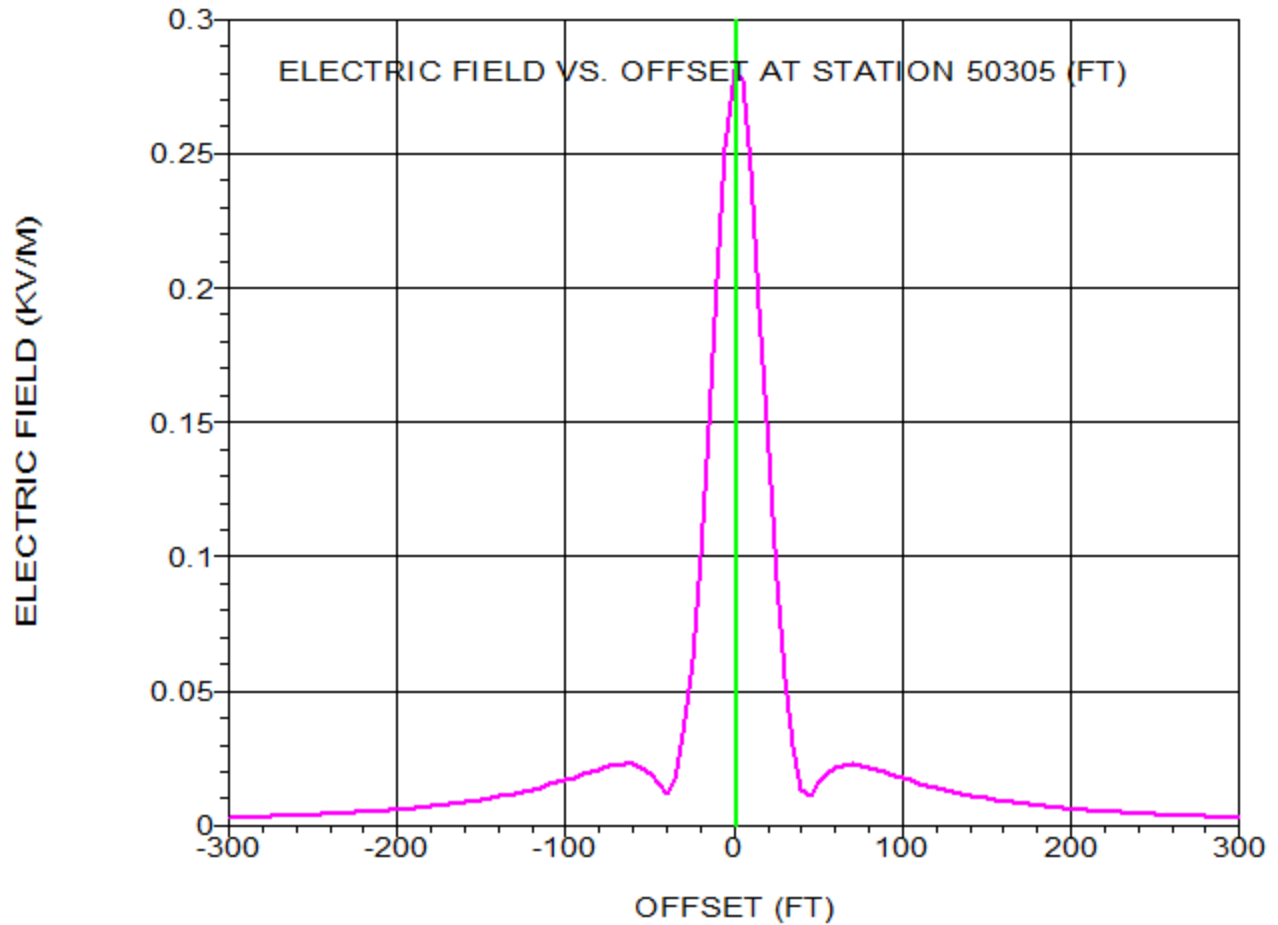
Set #	Phase #	Weather Case	Cable Condition	Wind From	Wire X (ft)	Wire Y (ft)	Wire Z (ft)	Wire Station (ft)	Wire Offset (ft)	Eqv. Wire Diameter (in)	Wire Voltage To Gnd. (kV)
5	1	212° F	Max Sag	RS	Left	2175060.22	17012577.96	929.47	50304.56	2.04	19.92
5	2	212° F	Max Sag	RS	Left	2175060.28	17012577.88	921.25	50304.56	2.14	19.92
5	3	212° F	Max Sag	RS	Left	2175060.22	17012577.96	913.33	50304.56	2.04	19.92

Maximum magnetic field of 16.10 (mG) found at station 50304.52, offset 0.00 (ft)

Maximum electric field of 0.281 (kV/m) found at station 50304.52, offset 0.00 (ft)

MAGNETIC FIELD (MG)





EMF Calculation Results:

Station	Offset	X	Y	Z	B	B B	Phase	B rms
E	E E Phase	E Axis	E rms					
Real	Img.	Angle	Angle	Res.	Real	Img.	Angle	Res.
(ft)	(ft)	(ft)	(ft)	(ft)	(mG)	(mG)	(deg)	
(mG)(kV/m)	(kV/m)	(deg)	(deg)	(kV/m)				

50304.52	-300.00	2174877.09	17012818.16	884.90	0.167	0.09332	29.2	0.192
0.003	0.00084	17.4	88.9	0.003				
50304.52	-295.00	2174880.12	17012814.18	884.90	0.173	0.09637	29.2	0.198
0.003	0.00087	17.4	88.9	0.003				
50304.52	-290.00	2174883.16	17012810.20	884.90	0.178	0.09957	29.2	0.204
0.003	0.00090	17.3	88.9	0.003				
50304.52	-285.00	2174886.19	17012806.23	884.90	0.184	0.10293	29.2	0.211
0.003	0.00093	17.3	88.9	0.003				
50304.52	-280.00	2174889.22	17012802.25	884.90	0.190	0.10648	29.2	0.218
0.003	0.00096	17.3	88.8	0.003				
50304.52	-275.00	2174892.25	17012798.27	884.90	0.197	0.11021	29.2	0.226
0.003	0.00099	17.3	88.8	0.003				
50304.52	-270.00	2174895.28	17012794.30	884.90	0.204	0.11415	29.2	0.234
0.003	0.00103	17.3	88.8	0.003				

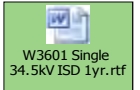
50304.52	-265.00	2174898.31	17012790.32	884.90	0.211	0.11831	29.3	0.242
0.003	0.00106	17.3	88.8	0.004				
50304.52	-260.00	2174901.34	17012786.34	884.90	0.219	0.12270	29.3	0.251
0.004	0.00110	17.3	88.8	0.004				
50304.52	-255.00	2174904.37	17012782.37	884.90	0.227	0.12735	29.3	0.260
0.004	0.00114	17.3	88.8	0.004				
50304.52	-250.00	2174907.40	17012778.39	884.90	0.236	0.13227	29.3	0.270
0.004	0.00118	17.3	88.7	0.004				
50304.52	-245.00	2174910.43	17012774.41	884.90	0.245	0.13749	29.3	0.281
0.004	0.00123	17.3	88.7	0.004				
50304.52	-240.00	2174913.47	17012770.44	884.90	0.255	0.14302	29.3	0.292
0.004	0.00127	17.3	88.7	0.004				
50304.52	-235.00	2174916.50	17012766.46	884.90	0.265	0.14891	29.3	0.304
0.004	0.00132	17.3	88.7	0.004				
50304.52	-230.00	2174919.53	17012762.48	884.90	0.276	0.15517	29.4	0.317
0.004	0.00138	17.3	88.6	0.005				
50304.52	-225.00	2174922.56	17012758.51	884.90	0.288	0.16183	29.4	0.330
0.005	0.00143	17.3	88.6	0.005				
50304.52	-220.00	2174925.59	17012754.53	884.90	0.300	0.16895	29.4	0.344
0.005	0.00149	17.3	88.6	0.005				
50304.52	-215.00	2174928.62	17012750.55	884.90	0.313	0.17654	29.4	0.360
0.005	0.00155	17.3	88.6	0.005				
50304.52	-210.00	2174931.65	17012746.58	884.90	0.327	0.18467	29.4	0.376
0.005	0.00162	17.3	88.5	0.005				
50304.52	-205.00	2174934.68	17012742.60	884.90	0.343	0.19338	29.4	0.393
0.005	0.00169	17.3	88.5	0.006				
50304.52	-200.00	2174937.71	17012738.62	884.90	0.359	0.20272	29.5	0.412
0.006	0.00176	17.3	88.5	0.006				
50304.52	-195.00	2174940.74	17012734.65	884.90	0.376	0.21276	29.5	0.432
0.006	0.00184	17.3	88.5	0.006				
50304.52	-190.00	2174943.77	17012730.67	884.90	0.395	0.22357	29.5	0.454
0.006	0.00193	17.3	88.4	0.006				
50304.52	-185.00	2174946.81	17012726.69	884.90	0.416	0.23522	29.5	0.477
0.006	0.00202	17.3	88.4	0.007				
50304.52	-180.00	2174949.84	17012722.72	884.90	0.437	0.24782	29.5	0.503
0.007	0.00212	17.3	88.4	0.007				
50304.52	-175.00	2174952.87	17012718.74	884.90	0.461	0.26146	29.6	0.530
0.007	0.00222	17.2	88.3	0.007				
50304.52	-170.00	2174955.90	17012714.76	884.90	0.487	0.27626	29.6	0.560
0.008	0.00233	17.2	88.3	0.008				
50304.52	-165.00	2174958.93	17012710.79	884.90	0.515	0.29236	29.6	0.592
0.008	0.00245	17.2	88.3	0.008				
50304.52	-160.00	2174961.96	17012706.81	884.90	0.545	0.30990	29.6	0.627
0.008	0.00257	17.2	88.2	0.009				
50304.52	-155.00	2174964.99	17012702.83	884.90	0.578	0.32907	29.7	0.665
0.009	0.00271	17.2	88.2	0.009				
50304.52	-150.00	2174968.02	17012698.86	884.90	0.614	0.35006	29.7	0.707
0.009	0.00285	17.2	88.2	0.010				
50304.52	-145.00	2174971.05	17012694.88	884.90	0.654	0.37312	29.7	0.753
0.010	0.00301	17.2	88.1	0.010				
50304.52	-140.00	2174974.08	17012690.90	884.90	0.697	0.39852	29.8	0.803
0.010	0.00317	17.1	88.1	0.011				
50304.52	-135.00	2174977.12	17012686.93	884.90	0.745	0.42659	29.8	0.859
0.011	0.00335	17.1	88.1	0.011				
50304.52	-130.00	2174980.15	17012682.95	884.90	0.798	0.45769	29.8	0.920
0.012	0.00353	17.1	88.0	0.012				
50304.52	-125.00	2174983.18	17012678.97	884.90	0.857	0.49229	29.9	0.988

0.012	0.00373	17.0	88.0	0.013					
50304.52	-120.00	2174986.21	17012675.00	884.90	0.923	0.53091	29.9	1.064	
0.013	0.00395	17.0	88.0	0.014					
50304.52	-115.00	2174989.24	17012671.02	884.90	0.996	0.57418	30.0	1.149	
0.014	0.00417	16.9	88.0	0.014					
50304.52	-110.00	2174992.27	17012667.05	884.90	1.078	0.62286	30.0	1.245	
0.015	0.00440	16.9	88.0	0.015					
50304.52	-105.00	2174995.30	17012663.07	884.90	1.170	0.67788	30.1	1.352	
0.015	0.00465	16.8	88.0	0.016					
50304.52	-100.00	2174998.33	17012659.09	884.90	1.274	0.74034	30.2	1.473	
0.016	0.00489	16.7	88.0	0.017					
50304.52	-95.00	2175001.36	17012655.12	884.90	1.392	0.81161	30.2	1.611	
0.017	0.00514	16.5	88.1	0.018					
50304.52	-90.00	2175004.39	17012651.14	884.90	1.527	0.89335	30.3	1.769	
0.018	0.00537	16.3	88.2	0.019					
50304.52	-85.00	2175007.43	17012647.16	884.90	1.681	0.98762	30.4	1.950	
0.019	0.00557	16.1	88.3	0.020					
50304.52	-80.00	2175010.46	17012643.19	884.90	1.858	1.09701	30.6	2.158	
0.020	0.00573	15.8	88.5	0.021					
50304.52	-75.00	2175013.49	17012639.21	884.90	2.063	1.22473	30.7	2.399	
0.021	0.00579	15.3	88.8	0.022					
50304.52	-70.00	2175016.52	17012635.23	884.90	2.302	1.37486	30.9	2.681	
0.022	0.00572	14.7	89.2	0.023					
50304.52	-65.00	2175019.55	17012631.26	884.90	2.580	1.55255	31.0	3.011	
0.022	0.00543	13.7	89.9	0.023					
50304.52	-60.00	2175022.58	17012627.28	884.90	2.907	1.76435	31.3	3.401	
0.022	0.00481	12.2	91.0	0.023					
50304.52	-55.00	2175025.61	17012623.30	884.90	3.293	2.01862	31.5	3.863	
0.021	0.00372	9.9	92.7	0.022					
50304.52	-50.00	2175028.64	17012619.33	884.90	3.751	2.32598	31.8	4.414	
0.019	0.00223	6.6	95.5	0.019					
50304.52	-45.00	2175031.67	17012615.35	884.90	4.294	2.69979	32.2	5.072	
0.016	0.00306	11.0	100.2	0.016					
50304.52	-40.00	2175034.70	17012611.37	884.90	4.940	3.15652	32.6	5.862	
0.010	0.00800	37.7	100.0	0.012					
50304.52	-35.00	2175037.73	17012607.40	884.90	5.706	3.71548	33.1	6.809	
0.007	0.01625	65.3	62.3	0.017					
50304.52	-30.00	2175040.77	17012603.42	884.90	6.607	4.39724	33.6	7.937	
0.019	0.02888	56.6	66.8	0.034					
50304.52	-25.00	2175043.80	17012599.44	884.90	7.651	5.21870	34.3	9.261	
0.040	0.04750	50.0	71.5	0.062					
50304.52	-20.00	2175046.83	17012595.47	884.90	8.823	6.18203	35.0	10.773	
0.068	0.07361	47.2	74.9	0.100					
50304.52	-15.00	2175049.86	17012591.49	884.90	10.071	7.25398	35.8	12.412	
0.103	0.10756	46.2	77.8	0.149					
50304.52	-10.00	2175052.89	17012587.51	884.90	11.281	8.33680	36.5	14.027	
0.141	0.14644	46.1	80.9	0.203					
50304.52	-5.00	2175055.92	17012583.54	884.90	12.266	9.24948	37.0	15.363	
0.174	0.18232	46.3	84.4	0.252					
50304.52	0.00	2175058.95	17012579.56	884.90	12.805	9.76251	37.3	16.102	
0.194	0.20337	46.4	88.3	0.281					
50304.52	5.00	2175061.98	17012575.58	884.90	12.747	9.71219	37.3	16.026	
0.192	0.20063	46.3	92.4	0.278					
50304.52	10.00	2175065.01	17012571.61	884.90	12.110	9.11586	37.0	15.157	
0.170	0.17523	45.9	96.3	0.244					
50304.52	15.00	2175068.04	17012567.63	884.90	11.066	8.15849	36.4	13.748	
0.135	0.13747	45.5	99.7	0.193					

50304.52	20.00	2175071.08	17012563.65	884.90	9.836	7.06722	35.7	12.112
0.097	0.09882	45.4	102.8	0.139				
50304.52	25.00	2175074.11	17012559.68	884.90	8.595	6.00905	35.0	10.487
0.064	0.06622	46.2	105.8	0.092				
50304.52	30.00	2175077.14	17012555.70	884.90	7.444	5.06870	34.3	9.006
0.036	0.04169	48.8	109.6	0.055				
50304.52	35.00	2175080.17	17012551.72	884.90	6.426	4.27154	33.6	7.716
0.017	0.02451	55.3	115.4	0.030				
50304.52	40.00	2175083.20	17012547.75	884.90	5.551	3.61181	33.1	6.622
0.007	0.01303	61.8	121.9	0.013				
50304.52	45.00	2175086.23	17012543.77	884.90	4.808	3.07145	32.6	5.705
0.011	0.00575	28.0	72.8	0.011				
50304.52	50.00	2175089.26	17012539.79	884.90	4.182	2.62992	32.2	4.940
0.016	0.00222	7.9	79.7	0.016				
50304.52	55.00	2175092.29	17012535.82	884.90	3.656	2.26832	31.8	4.302
0.019	0.00323	9.5	84.8	0.019				
50304.52	60.00	2175095.32	17012531.84	884.90	3.213	1.97073	31.5	3.769
0.021	0.00470	12.6	87.5	0.022				
50304.52	65.00	2175098.35	17012527.86	884.90	2.838	1.72428	31.3	3.321
0.022	0.00560	14.4	89.2	0.023				
50304.52	70.00	2175101.39	17012523.89	884.90	2.521	1.51876	31.1	2.943
0.022	0.00606	15.5	90.2	0.023				
50304.52	75.00	2175104.42	17012519.91	884.90	2.250	1.34615	30.9	2.622
0.021	0.00622	16.2	90.8	0.022				
50304.52	80.00	2175107.45	17012515.93	884.90	2.019	1.20015	30.7	2.348
0.021	0.00620	16.7	91.2	0.022				
50304.52	85.00	2175110.48	17012511.96	884.90	1.819	1.07580	30.6	2.113
0.020	0.00605	17.0	91.5	0.021				
50304.52	90.00	2175113.51	17012507.98	884.90	1.646	0.96920	30.5	1.910
0.019	0.00584	17.2	91.7	0.020				
50304.52	95.00	2175116.54	17012504.01	884.90	1.496	0.87724	30.4	1.734
0.018	0.00559	17.3	91.8	0.019				
50304.52	100.00	2175119.57	17012500.03	884.90	1.365	0.79743	30.3	1.581
0.017	0.00532	17.4	91.9	0.018				
50304.52	105.00	2175122.60	17012496.05	884.90	1.250	0.72780	30.2	1.446
0.016	0.00504	17.5	92.0	0.017				
50304.52	110.00	2175125.63	17012492.08	884.90	1.148	0.66672	30.1	1.328
0.015	0.00477	17.5	92.0	0.016				
50304.52	115.00	2175128.66	17012488.10	884.90	1.058	0.61288	30.1	1.223
0.014	0.00451	17.6	92.0	0.015				
50304.52	120.00	2175131.69	17012484.12	884.90	0.978	0.56521	30.0	1.129
0.013	0.00426	17.6	92.0	0.014				
50304.52	125.00	2175134.73	17012480.15	884.90	0.906	0.52281	30.0	1.046
0.013	0.00402	17.6	92.0	0.013				
50304.52	130.00	2175137.76	17012476.17	884.90	0.842	0.48495	29.9	0.972
0.012	0.00380	17.6	92.0	0.013				
50304.52	135.00	2175140.79	17012472.19	884.90	0.785	0.45101	29.9	0.905
0.011	0.00359	17.6	91.9	0.012				
50304.52	140.00	2175143.82	17012468.22	884.90	0.733	0.42048	29.9	0.845
0.011	0.00340	17.7	91.9	0.011				
50304.52	145.00	2175146.85	17012464.24	884.90	0.686	0.39292	29.8	0.790
0.010	0.00321	17.7	91.9	0.011				
50304.52	150.00	2175149.88	17012460.26	884.90	0.643	0.36797	29.8	0.741
0.010	0.00304	17.7	91.9	0.010				
50304.52	155.00	2175152.91	17012456.29	884.90	0.604	0.34531	29.8	0.696
0.009	0.00288	17.7	91.8	0.010				
50304.52	160.00	2175155.94	17012452.31	884.90	0.569	0.32467	29.7	0.655

0.009	0.00273	17.7	91.8	0.009					
50304.52	165.00	2175158.97	17012448.33	884.90	0.536	0.30582	29.7	0.617	
0.008	0.00260	17.7	91.8	0.009					
50304.52	170.00	2175162.00	17012444.36	884.90	0.506	0.28857	29.7	0.583	
0.008	0.00247	17.6	91.7	0.008					
50304.52	175.00	2175165.04	17012440.38	884.90	0.479	0.27273	29.7	0.551	
0.007	0.00235	17.6	91.7	0.008					
50304.52	180.00	2175168.07	17012436.40	884.90	0.454	0.25816	29.6	0.522	
0.007	0.00223	17.6	91.7	0.007					
50304.52	185.00	2175171.10	17012432.43	884.90	0.431	0.24473	29.6	0.495	
0.007	0.00213	17.6	91.6	0.007					
50304.52	190.00	2175174.13	17012428.45	884.90	0.409	0.23232	29.6	0.470	
0.006	0.00203	17.6	91.6	0.007					
50304.52	195.00	2175177.16	17012424.47	884.90	0.389	0.22083	29.6	0.447	
0.006	0.00194	17.6	91.6	0.006					
50304.52	200.00	2175180.19	17012420.50	884.90	0.371	0.21018	29.6	0.426	
0.006	0.00185	17.6	91.5	0.006					
50304.52	205.00	2175183.22	17012416.52	884.90	0.353	0.20029	29.5	0.406	
0.006	0.00177	17.6	91.5	0.006					
50304.52	210.00	2175186.25	17012412.54	884.90	0.337	0.19108	29.5	0.388	
0.005	0.00169	17.6	91.5	0.006					
50304.52	215.00	2175189.28	17012408.57	884.90	0.322	0.18250	29.5	0.370	
0.005	0.00162	17.6	91.5	0.005					
50304.52	220.00	2175192.31	17012404.59	884.90	0.308	0.17448	29.5	0.354	
0.005	0.00156	17.6	91.4	0.005					
50304.52	225.00	2175195.35	17012400.61	884.90	0.295	0.16699	29.5	0.339	
0.005	0.00149	17.6	91.4	0.005					
50304.52	230.00	2175198.38	17012396.64	884.90	0.283	0.15998	29.5	0.325	
0.005	0.00143	17.6	91.4	0.005					
50304.52	235.00	2175201.41	17012392.66	884.90	0.272	0.15340	29.5	0.312	
0.004	0.00138	17.6	91.4	0.005					
50304.52	240.00	2175204.44	17012388.68	884.90	0.261	0.14722	29.4	0.299	
0.004	0.00132	17.6	91.3	0.004					
50304.52	245.00	2175207.47	17012384.71	884.90	0.251	0.14142	29.4	0.288	
0.004	0.00127	17.6	91.3	0.004					
50304.52	250.00	2175210.50	17012380.73	884.90	0.241	0.13595	29.4	0.277	
0.004	0.00123	17.6	91.3	0.004					
50304.52	255.00	2175213.53	17012376.75	884.90	0.232	0.13080	29.4	0.266	
0.004	0.00118	17.6	91.3	0.004					
50304.52	260.00	2175216.56	17012372.78	884.90	0.224	0.12595	29.4	0.257	
0.004	0.00114	17.6	91.2	0.004					
50304.52	265.00	2175219.59	17012368.80	884.90	0.216	0.12136	29.4	0.247	
0.003	0.00110	17.6	91.2	0.004					
50304.52	270.00	2175222.62	17012364.82	884.90	0.208	0.11702	29.4	0.239	
0.003	0.00106	17.6	91.2	0.004					
50304.52	275.00	2175225.65	17012360.85	884.90	0.201	0.11292	29.4	0.230	
0.003	0.00102	17.6	91.2	0.003					
50304.52	280.00	2175228.69	17012356.87	884.90	0.194	0.10903	29.4	0.222	
0.003	0.00099	17.6	91.2	0.003					
50304.52	285.00	2175231.72	17012352.89	884.90	0.187	0.10534	29.3	0.215	
0.003	0.00096	17.6	91.1	0.003					
50304.52	290.00	2175234.75	17012348.92	884.90	0.181	0.10184	29.3	0.208	
0.003	0.00092	17.6	91.1	0.003					
50304.52	295.00	2175237.78	17012344.94	884.90	0.175	0.09852	29.3	0.201	
0.003	0.00089	17.6	91.1	0.003					
50304.52	300.00	2175240.81	17012340.97	884.90	0.170	0.09536	29.3	0.195	
0.003	0.00087	17.6	91.1	0.003					

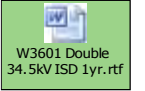
Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	169.65	-300	2150485.41	16931421.68	636.15	0.199	0.12224	31.6	0.234	0.003	0.00102	17.3	89	0.003
2	169.65	-295	2150490.23	16931420.34	636.15	0.205	0.12562	31.6	0.24	0.003	0.00105	17.3	89	0.004
3	169.65	-290	2150495.04	16931419	636.15	0.21	0.12916	31.6	0.247	0.003	0.00108	17.3	89	0.004
4	169.65	-285	2150499.86	16931417.66	636.15	0.216	0.13288	31.5	0.254	0.004	0.00111	17.3	89	0.004
5	169.65	-280	2150504.68	16931416.33	636.15	0.223	0.13679	31.5	0.261	0.004	0.00114	17.3	89	0.004
6	169.65	-275	2150509.49	16931414.99	636.15	0.23	0.14089	31.5	0.269	0.004	0.00117	17.3	89	0.004
7	169.65	-270	2150514.31	16931413.65	636.15	0.237	0.14521	31.5	0.278	0.004	0.00121	17.3	88.9	0.004
8	169.65	-265	2150519.13	16931412.31	636.15	0.244	0.14975	31.5	0.286	0.004	0.00125	17.3	88.9	0.004
9	169.65	-260	2150523.95	16931410.97	636.15	0.252	0.15454	31.5	0.295	0.004	0.00129	17.2	88.9	0.004
10	169.65	-255	2150528.76	16931409.63	636.15	0.26	0.15959	31.5	0.305	0.004	0.00132	17.2	88.9	0.004
11	169.65	-250	2150533.58	16931408.29	636.15	0.269	0.16492	31.5	0.315	0.004	0.00137	17.2	88.9	0.005
12	169.65	-245	2150538.4	16931406.95	636.15	0.278	0.17056	31.5	0.326	0.005	0.00141	17.2	88.9	0.005
13	169.65	-240	2150543.21	16931405.61	636.15	0.288	0.17652	31.5	0.338	0.005	0.00145	17.2	88.9	0.005
14	169.65	-235	2150548.03	16931404.27	636.15	0.298	0.18284	31.5	0.35	0.005	0.0015	17.1	88.9	0.005
15	169.65	-230	2150552.85	16931402.93	636.15	0.309	0.18953	31.5	0.362	0.005	0.00155	17.1	88.8	0.005
16	169.65	-225	2150557.67	16931401.59	636.15	0.32	0.19664	31.5	0.376	0.005	0.0016	17.1	88.8	0.005
17	169.65	-220	2150562.48	16931400.25	636.15	0.333	0.20419	31.5	0.39	0.005	0.00165	17	88.8	0.006
18	169.65	-215	2150567.3	16931398.91	636.15	0.346	0.21223	31.6	0.406	0.006	0.00171	17	88.8	0.006
19	169.65	-210	2150572.12	16931397.57	636.15	0.359	0.22079	31.6	0.422	0.006	0.00176	17	88.8	0.006
20	169.65	-205	2150576.94	16931396.23	636.15	0.374	0.22992	31.6	0.439	0.006	0.00182	16.9	88.8	0.006
21	169.65	-200	2150581.75	16931394.89	636.15	0.39	0.23967	31.6	0.458	0.006	0.00188	16.9	88.8	0.006
22	169.65	-195	2150586.57	16931393.55	636.15	0.407	0.25011	31.6	0.477	0.006	0.00194	16.8	88.8	0.007
23	169.65	-190	2150591.39	16931392.21	636.15	0.425	0.26128	31.6	0.499	0.007	0.00201	16.8	88.8	0.007
24	169.65	-185	2150596.2	16931390.88	636.15	0.444	0.27327	31.6	0.521	0.007	0.00207	16.7	88.8	0.007
25	169.65	-180	2150601.02	16931389.54	636.15	0.465	0.28615	31.6	0.546	0.007	0.00214	16.6	88.8	0.007
26	169.65	-175	2150605.84	16931388.2	636.15	0.487	0.30001	31.7	0.572	0.007	0.00221	16.6	88.8	0.008
27	169.65	-170	2150610.66	16931386.86	636.15	0.51	0.31495	31.7	0.6	0.008	0.00227	16.5	88.8	0.008
28	169.65	-165	2150615.47	16931385.52	636.15	0.536	0.33109	31.7	0.63	0.008	0.00234	16.4	88.8	0.008
29	169.65	-160	2150620.29	16931384.18	636.15	0.564	0.34854	31.7	0.663	0.008	0.00241	16.2	88.8	0.009
30	169.65	-155	2150625.11	16931382.84	636.15	0.594	0.36745	31.8	0.698	0.009	0.00247	16.1	88.8	0.009
31	169.65	-150	2150629.93	16931381.5	636.15	0.626	0.38799	31.8	0.736	0.009	0.00253	15.9	88.9	0.009
32	169.65	-145	2150634.74	16931380.16	636.15	0.661	0.41033	31.8	0.778	0.009	0.00258	15.8	88.9	0.01
33	169.65	-140	2150639.56	16931378.82	636.15	0.699	0.43468	31.9	0.823	0.009	0.00263	15.5	89	0.01
34	169.65	-135	2150644.38	16931377.48	636.15	0.74	0.46129	31.9	0.872	0.01	0.00266	15.3	89	0.01
35	169.65	-130	2150649.19	16931376.14	636.15	0.786	0.49042	32	0.926	0.01	0.00268	15	89.1	0.01
36	169.65	-125	2150654.01	16931374.8	636.15	0.835	0.52238	32	0.985	0.01	0.00268	14.6	89.2	0.011
37	169.65	-120	2150658.83	16931373.46	636.15	0.889	0.55753	32.1	1.049	0.011	0.00266	14.1	89.4	0.011
38	169.65	-115	2150663.65	16931372.12	636.15	0.948	0.59628	32.2	1.12	0.011	0.00259	13.6	89.5	0.011
39	169.65	-110	2150668.46	16931370.78	636.15	1.013	0.63909	32.3	1.197	0.011	0.00249	12.9	89.8	0.011
40	169.65	-105	2150673.28	16931369.44	636.15	1.084	0.6865	32.3	1.283	0.011	0.00232	12	90.1	0.011
41	169.65	-100	2150678.1	16931368.1	636.15	1.163	0.73912	32.4	1.378	0.011	0.00208	10.8	90.4	0.011
42	169.65	-95	2150682.92	16931366.77	636.15	1.249	0.79767	32.6	1.482	0.011	0.00175	9.2	90.9	0.011
43	169.65	-90	2150687.73	16931365.43	636.15	1.345	0.86296	32.7	1.598	0.01	0.0013	7.1	91.6	0.011
44	169.65	-85	2150692.55	16931364.09	636.15	1.451	0.93591	32.8	1.727	0.01	0.00077	4.4	92.5	0.01
45	169.65	-80	2150697.37	16931362.75	636.15	1.568	1.01755	33	1.869	0.009	0.00063	4	93.7	0.009
46	169.65	-75	2150702.18	16931361.41	636.15	1.698	1.10907	33.2	2.028	0.008	0.00155	11	95	0.008
47	169.65	-70	2150707	16931360.07	636.15	1.842	1.21176	33.3	2.205	0.006	0.00299	25	95.4	0.007
48	169.65	-65	2150711.82	16931358.73	636.15	2.001	1.327	33.6	2.401	0.004	0.0049	48.2	90	0.006
49	169.65	-60	2150716.64	16931357.39	636.15	2.176	1.45624	33.8	2.619	0.002	0.00738	72.5	78.8	0.007
50	169.65	-55	2150721.45	16931356.05	636.15	2.369	1.6009	34	2.86	0.003	0.01057	71.8	75.5	0.011
51	169.65	-50	2150726.27	16931354.71	636.15	2.581	1.7622	34.3	3.125	0.008	0.01462	62.2	76.5	0.016
52	169.65	-45	2150731.09	16931353.37	636.15	2.811	1.94098	34.6	3.416	0.013	0.01971	55.8	78	0.024
53	169.65	-40	2150735.9	16931352.03	636.15	3.058	2.13727	35	3.731	0.02	0.02599	52	79.4	0.033
54	169.65	-35	2150740.72	16931350.69	636.15	3.32	2.34987	35.3	4.067	0.029	0.0336	49.6	80.5	0.044



55	169.65	-30	2150745.54	16931349.35	636.15	3.592	2.57566	35.6	4.42	0.038	0.04256	48.1	81.6	0.057
56	169.65	-25	2150750.36	16931348.01	636.15	3.868	2.80892	36	4.78	0.049	0.05275	47.3	82.7	0.072
57	169.65	-20	2150755.17	16931346.67	636.15	4.136	3.04068	36.3	5.133	0.06	0.06378	46.9	83.8	0.087
58	169.65	-15	2150759.99	16931345.33	636.15	4.383	3.25852	36.6	5.462	0.071	0.07495	46.7	84.9	0.103
59	169.65	-10	2150764.81	16931343.99	636.15	4.594	3.44709	36.9	5.744	0.08	0.08523	46.7	86.2	0.117
60	169.65	-5	2150769.63	16931342.65	636.15	4.752	3.58999	37.1	5.956	0.088	0.09342	46.7	87.6	0.128
61	169.65	0	2150774.44	16931341.32	636.15	4.843	3.67265	37.2	6.078	0.092	0.09835	46.8	89	0.135
62	169.65	5	2150779.26	16931339.98	636.15	4.857	3.68572	37.2	6.097	0.093	0.09926	46.8	90.4	0.136
63	169.65	10	2150784.08	16931338.64	636.15	4.794	3.62762	37.1	6.012	0.09	0.09599	46.8	91.9	0.132
64	169.65	15	2150788.89	16931337.3	636.15	4.659	3.50499	37	5.83	0.084	0.08909	46.8	93.2	0.122
65	169.65	20	2150793.71	16931335.96	636.15	4.466	3.33081	36.7	5.571	0.075	0.07959	46.8	94.5	0.109
66	169.65	25	2150798.53	16931334.62	636.15	4.229	3.12123	36.4	5.256	0.064	0.06871	47	95.7	0.094
67	169.65	30	2150803.35	16931333.28	636.15	3.966	2.89231	36.1	4.909	0.053	0.05758	47.4	96.8	0.078
68	169.65	35	2150808.16	16931331.94	636.15	3.691	2.65771	35.8	4.548	0.042	0.04702	48.1	97.9	0.063
69	169.65	40	2150812.98	16931330.6	636.15	3.416	2.42773	35.4	4.191	0.032	0.03755	49.3	98.9	0.05
70	169.65	45	2150817.8	16931329.26	636.15	3.149	2.20926	35.1	3.846	0.024	0.02939	51.3	100	0.038
71	169.65	50	2150822.62	16931327.92	636.15	2.895	2.00629	34.7	3.522	0.016	0.02257	54.6	101.2	0.028
72	169.65	55	2150827.43	16931326.58	636.15	2.658	1.82067	34.4	3.222	0.01	0.01701	59.9	102.6	0.02
73	169.65	60	2150832.25	16931325.24	636.15	2.439	1.65274	34.1	2.947	0.005	0.01254	68.2	103.8	0.013
74	169.65	65	2150837.07	16931323.9	636.15	2.239	1.5019	33.9	2.696	0.002	0.00899	76.5	103	0.009
75	169.65	70	2150841.88	16931322.56	636.15	2.057	1.36702	33.6	2.47	0.003	0.00622	61.3	95.5	0.007
76	169.65	75	2150846.7	16931321.22	636.15	1.892	1.24674	33.4	2.266	0.006	0.00406	36.3	86.7	0.007
77	169.65	80	2150851.52	16931319.88	636.15	1.743	1.13958	33.2	2.082	0.007	0.0024	18.3	85	0.008
78	169.65	85	2150856.34	16931318.54	636.15	1.608	1.04413	33	1.917	0.009	0.00118	7.8	86	0.009
79	169.65	90	2150861.15	16931317.2	636.15	1.486	0.95904	32.8	1.769	0.01	0.00051	3.1	87.1	0.01
80	169.65	95	2150865.97	16931315.87	636.15	1.376	0.88309	32.7	1.635	0.01	0.00084	4.7	88.1	0.01
81	169.65	100	2150870.79	16931314.53	636.15	1.277	0.81519	32.6	1.515	0.011	0.00133	7.2	88.8	0.011
82	169.65	105	2150875.6	16931313.19	636.15	1.187	0.75435	32.4	1.406	0.011	0.00172	9.1	89.4	0.011
83	169.65	110	2150880.42	16931311.85	636.15	1.105	0.69974	32.3	1.308	0.011	0.00201	10.5	89.8	0.011
84	169.65	115	2150885.24	16931310.51	636.15	1.032	0.6506	32.2	1.22	0.011	0.00221	11.6	90.1	0.011
85	169.65	120	2150890.06	16931309.17	636.15	0.965	0.60629	32.2	1.139	0.011	0.00236	12.4	90.4	0.011
86	169.65	125	2150894.87	16931307.83	636.15	0.904	0.56622	32.1	1.066	0.01	0.00245	13.1	90.6	0.011
87	169.65	130	2150899.69	16931306.49	636.15	0.848	0.52992	32	1	0.01	0.0025	13.7	90.7	0.011
88	169.65	135	2150904.51	16931305.15	636.15	0.797	0.49695	31.9	0.939	0.01	0.00252	14.1	90.8	0.01
89	169.65	140	2150909.33	16931303.81	636.15	0.751	0.46693	31.9	0.884	0.01	0.00252	14.5	90.9	0.01
90	169.65	145	2150914.14	16931302.47	636.15	0.708	0.43955	31.8	0.833	0.009	0.00249	14.8	91	0.01
91	169.65	150	2150918.96	16931301.13	636.15	0.669	0.41451	31.8	0.787	0.009	0.00246	15	91.1	0.009
92	169.65	155	2150923.78	16931299.79	636.15	0.633	0.39156	31.7	0.744	0.009	0.00242	15.3	91.1	0.009
93	169.65	160	2150928.59	16931298.45	636.15	0.6	0.37049	31.7	0.705	0.009	0.00237	15.4	91.2	0.009
94	169.65	165	2150933.41	16931297.11	636.15	0.569	0.35111	31.7	0.669	0.008	0.00231	15.6	91.2	0.009
95	169.65	170	2150938.23	16931295.77	636.15	0.541	0.33324	31.6	0.635	0.008	0.00225	15.7	91.2	0.008
96	169.65	175	2150943.05	16931294.43	636.15	0.515	0.31674	31.6	0.604	0.008	0.00219	15.9	91.2	0.008
97	169.65	180	2150947.86	16931293.09	636.15	0.49	0.30147	31.6	0.576	0.007	0.00213	16	91.2	0.008
98	169.65	185	2150952.68	16931291.76	636.15	0.468	0.28732	31.6	0.549	0.007	0.00206	16.1	91.2	0.007
99	169.65	190	2150957.5	16931290.42	636.15	0.447	0.27418	31.5	0.524	0.007	0.002	16.2	91.2	0.007
100	169.65	195	2150962.32	16931289.08	636.15	0.427	0.26197	31.5	0.501	0.007	0.00194	16.2	91.2	0.007
101	169.65	200	2150967.13	16931287.74	636.15	0.409	0.25059	31.5	0.479	0.006	0.00188	16.3	91.2	0.007
102	169.65	205	2150971.95	16931286.4	636.15	0.392	0.23997	31.5	0.459	0.006	0.00182	16.4	91.2	0.006
103	169.65	210	2150976.77	16931285.06	636.15	0.376	0.23006	31.5	0.44	0.006	0.00176	16.4	91.2	0.006
104	169.65	215	2150981.58	16931283.72	636.15	0.361	0.22079	31.5	0.423	0.006	0.00171	16.5	91.2	0.006
105	169.65	220	2150986.4	16931282.38	636.15	0.347	0.2121	31.5	0.406	0.006	0.00165	16.5	91.2	0.006
106	169.65	225	2150991.22	16931281.04	636.15	0.333	0.20395	31.5	0.391	0.005	0.0016	16.5	91.2	0.006
107	169.65	230	2150996.04	16931279.7	636.15	0.321	0.19629	31.5	0.376	0.005	0.00155	16.6	91.2	0.005
108	169.65	235	2151000.85	16931278.36	636.15	0.309	0.1891	31.4	0.362	0.005	0.0015	16.6	91.2	0.005
109	169.65	240	2151005.67	16931277.02	636.15	0.298	0.18232	31.4	0.35	0.005	0.00145	16.6	91.1	0.005

110	169.65	245	2151010.49	16931275.68	636.15	0.288	0.17594	31.4	0.337	0.005	0.00141	16.7	91.1	0.005
111	169.65	250	2151015.3	16931274.34	636.15	0.278	0.16991	31.4	0.326	0.005	0.00136	16.7	91.1	0.005
112	169.65	255	2151020.12	16931273	636.15	0.269	0.16422	31.4	0.315	0.004	0.00132	16.7	91.1	0.005
113	169.65	260	2151024.94	16931271.66	636.15	0.26	0.15884	31.4	0.305	0.004	0.00128	16.7	91.1	0.004
114	169.65	265	2151029.76	16931270.32	636.15	0.252	0.15374	31.4	0.295	0.004	0.00124	16.8	91.1	0.004
115	169.65	270	2151034.57	16931268.98	636.15	0.244	0.14891	31.4	0.286	0.004	0.0012	16.8	91.1	0.004
116	169.65	275	2151039.39	16931267.64	636.15	0.236	0.14434	31.4	0.277	0.004	0.00117	16.8	91.1	0.004
117	169.65	280	2151044.21	16931266.31	636.15	0.229	0.13999	31.4	0.268	0.004	0.00113	16.8	91.1	0.004
118	169.65	285	2151049.03	16931264.97	636.15	0.222	0.13586	31.4	0.261	0.004	0.0011	16.8	91	0.004
119	169.65	290	2151053.84	16931263.63	636.15	0.216	0.13194	31.4	0.253	0.004	0.00107	16.8	91	0.004
120	169.65	295	2151058.66	16931262.29	636.15	0.21	0.1282	31.4	0.246	0.003	0.00104	16.9	91	0.004
121	169.65	300	2151063.48	16931260.95	636.15	0.204	0.12464	31.4	0.239	0.003	0.00101	16.9	91	0.003

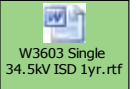
Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	37864.36	-300	2158063.64	16961510.89	931.31	0.222	0.12873	30.1	0.257	0.004	0.00105	13.8	88.9	0.004
2	37864.36	-295	2158068.64	16961510.9	931.31	0.23	0.13308	30.1	0.265	0.004	0.00109	13.8	88.9	0.005
3	37864.36	-290	2158073.64	16961510.92	931.31	0.238	0.13767	30.1	0.275	0.005	0.00112	13.8	88.9	0.005
4	37864.36	-285	2158078.64	16961510.93	931.31	0.246	0.14249	30.1	0.284	0.005	0.00116	13.8	88.9	0.005
5	37864.36	-280	2158083.64	16961510.94	931.31	0.255	0.14757	30.1	0.294	0.005	0.0012	13.8	88.8	0.005
6	37864.36	-275	2158088.64	16961510.96	931.31	0.264	0.15292	30.1	0.305	0.005	0.00124	13.7	88.8	0.005
7	37864.36	-270	2158093.64	16961510.97	931.31	0.273	0.15857	30.1	0.316	0.005	0.00128	13.7	88.8	0.005
8	37864.36	-265	2158098.64	16961510.98	931.31	0.284	0.16454	30.1	0.328	0.005	0.00133	13.7	88.8	0.006
9	37864.36	-260	2158103.64	16961510.99	931.31	0.294	0.17085	30.1	0.34	0.006	0.00137	13.7	88.8	0.006
10	37864.36	-255	2158108.64	16961511.01	931.31	0.306	0.17753	30.1	0.354	0.006	0.00142	13.7	88.7	0.006
11	37864.36	-250	2158113.64	16961511.02	931.31	0.318	0.18461	30.1	0.368	0.006	0.00148	13.7	88.7	0.006
12	37864.36	-245	2158118.64	16961511.03	931.31	0.331	0.19211	30.1	0.383	0.006	0.00153	13.7	88.7	0.006
13	37864.36	-240	2158123.64	16961511.05	931.31	0.345	0.20008	30.1	0.398	0.007	0.00159	13.7	88.7	0.007
14	37864.36	-235	2158128.64	16961511.06	931.31	0.359	0.20855	30.1	0.415	0.007	0.00165	13.7	88.7	0.007
15	37864.36	-230	2158133.64	16961511.07	931.31	0.375	0.21758	30.2	0.433	0.007	0.00171	13.7	88.6	0.007
16	37864.36	-225	2158138.64	16961511.08	931.31	0.391	0.22719	30.2	0.452	0.007	0.00178	13.6	88.6	0.008
17	37864.36	-220	2158143.64	16961511.1	931.31	0.409	0.23745	30.2	0.473	0.008	0.00186	13.6	88.6	0.008
18	37864.36	-215	2158148.64	16961511.11	931.31	0.427	0.24842	30.2	0.494	0.008	0.00193	13.6	88.6	0.008
19	37864.36	-210	2158153.64	16961511.12	931.31	0.447	0.26017	30.2	0.517	0.008	0.00201	13.6	88.5	0.009
20	37864.36	-205	2158158.64	16961511.14	931.31	0.469	0.27276	30.2	0.542	0.009	0.0021	13.6	88.5	0.009
21	37864.36	-200	2158163.64	16961511.15	931.31	0.492	0.28628	30.2	0.569	0.009	0.00219	13.6	88.5	0.009
22	37864.36	-195	2158168.64	16961511.16	931.31	0.517	0.30082	30.2	0.598	0.01	0.00229	13.5	88.4	0.01
23	37864.36	-190	2158173.64	16961511.17	931.31	0.543	0.31649	30.2	0.629	0.01	0.00239	13.5	88.4	0.01
24	37864.36	-185	2158178.64	16961511.19	931.31	0.572	0.33341	30.2	0.662	0.01	0.0025	13.5	88.4	0.011
25	37864.36	-180	2158183.64	16961511.2	931.31	0.603	0.35171	30.2	0.698	0.011	0.00262	13.5	88.4	0.011
26	37864.36	-175	2158188.64	16961511.21	931.31	0.637	0.37154	30.3	0.737	0.011	0.00274	13.4	88.3	0.012
27	37864.36	-170	2158193.64	16961511.23	931.31	0.673	0.39308	30.3	0.78	0.012	0.00287	13.4	88.3	0.012
28	37864.36	-165	2158198.64	16961511.24	931.31	0.713	0.41653	30.3	0.826	0.013	0.00301	13.3	88.3	0.013
29	37864.36	-160	2158203.64	16961511.25	931.31	0.756	0.44211	30.3	0.876	0.013	0.00315	13.3	88.2	0.014
30	37864.36	-155	2158208.64	16961511.26	931.31	0.803	0.4701	30.3	0.931	0.014	0.00331	13.2	88.2	0.014
31	37864.36	-150	2158213.64	16961511.28	931.31	0.855	0.50079	30.4	0.991	0.015	0.00348	13.2	88.2	0.015
32	37864.36	-145	2158218.64	16961511.29	931.31	0.912	0.53455	30.4	1.057	0.016	0.00365	13.1	88.1	0.016
33	37864.36	-140	2158223.64	16961511.3	931.31	0.975	0.57178	30.4	1.13	0.017	0.00383	13	88.1	0.017
34	37864.36	-135	2158228.64	16961511.32	931.31	1.044	0.61298	30.4	1.21	0.017	0.00403	13	88.1	0.018
35	37864.36	-130	2158233.64	16961511.33	931.31	1.12	0.65872	30.5	1.299	0.019	0.00423	12.9	88.1	0.019
36	37864.36	-125	2158238.64	16961511.34	931.31	1.205	0.70966	30.5	1.398	0.02	0.00444	12.7	88	0.02
37	37864.36	-120	2158243.64	16961511.35	931.31	1.3	0.76663	30.5	1.509	0.021	0.00465	12.6	88	0.021
38	37864.36	-115	2158248.64	16961511.37	931.31	1.406	0.83058	30.6	1.633	0.022	0.00486	12.4	88	0.023
39	37864.36	-110	2158253.64	16961511.38	931.31	1.524	0.90267	30.6	1.772	0.023	0.00507	12.2	88	0.024
40	37864.36	-105	2158258.64	16961511.39	931.31	1.659	0.98429	30.7	1.929	0.025	0.00526	12	88.1	0.025
41	37864.36	-100	2158263.64	16961511.41	931.31	1.811	1.07715	30.8	2.107	0.026	0.00543	11.7	88.1	0.027
42	37864.36	-95	2158268.64	16961511.42	931.31	1.983	1.18332	30.8	2.309	0.028	0.00555	11.3	88.2	0.028
43	37864.36	-90	2158273.64	16961511.43	931.31	2.181	1.30537	30.9	2.542	0.029	0.0056	10.9	88.3	0.03
44	37864.36	-85	2158278.64	16961511.44	931.31	2.407	1.44647	31	2.808	0.031	0.00554	10.2	88.5	0.031
45	37864.36	-80	2158283.64	16961511.46	931.31	2.669	1.61056	31.1	3.117	0.032	0.00532	9.4	88.8	0.032
46	37864.36	-75	2158288.64	16961511.47	931.31	2.972	1.80258	31.2	3.476	0.033	0.00485	8.3	89.2	0.033
47	37864.36	-70	2158293.64	16961511.48	931.31	3.325	2.02874	31.4	3.895	0.034	0.00402	6.8	89.8	0.034
48	37864.36	-65	2158298.64	16961511.5	931.31	3.739	2.29688	31.6	4.388	0.034	0.00275	4.6	90.6	0.034
49	37864.36	-60	2158303.64	16961511.51	931.31	4.226	2.61684	31.8	4.971	0.033	0.00177	3.1	91.9	0.033
50	37864.36	-55	2158308.64	16961511.52	931.31	4.801	3.001	32	5.662	0.03	0.00433	8.1	93.8	0.03
51	37864.36	-50	2158313.64	16961511.54	931.31	5.481	3.46462	32.3	6.484	0.025	0.0098	21.1	95.6	0.027
52	37864.36	-45	2158318.64	16961511.55	931.31	6.287	4.02609	32.6	7.465	0.018	0.01833	46.1	90.2	0.024
53	37864.36	-40	2158323.64	16961511.56	931.31	7.238	4.70628	33	8.633	0.011	0.0312	71.3	72.3	0.031
54	37864.36	-35	2158328.64	16961511.57	931.31	8.351	5.5262	33.5	10.014	0.023	0.05023	65	70.3	0.055



55	37864.36	-30	2158333.64	16961511.59	931.31	9.633	6.50109	34	11.621	0.052	0.07763	56.3	72.8	0.093
56	37864.36	-25	2158338.64	16961511.6	931.31	11.066	7.62834	34.6	13.44	0.091	0.11551	51.6	75.4	0.147
57	37864.36	-20	2158343.64	16961511.61	931.31	12.591	8.86797	35.2	15.4	0.141	0.16455	49.4	78	0.217
58	37864.36	-15	2158348.64	16961511.63	931.31	14.088	10.12067	35.7	17.347	0.197	0.22173	48.4	80.6	0.296
59	37864.36	-10	2158353.64	16961511.64	931.31	15.378	11.22275	36.1	19.038	0.25	0.27839	48.1	83.5	0.374
60	37864.36	-5	2158358.64	16961511.65	931.31	16.258	11.98322	36.4	20.197	0.289	0.32108	48	86.7	0.432
61	37864.36	0	2158363.64	16961511.66	931.31	16.57	12.25414	36.5	20.609	0.303	0.33705	48	90	0.453
62	37864.36	5	2158368.64	16961511.68	931.31	16.257	11.98216	36.4	20.196	0.289	0.32106	48	93.3	0.432
63	37864.36	10	2158373.64	16961511.69	931.31	15.377	11.22107	36.1	19.035	0.25	0.27837	48.1	96.5	0.374
64	37864.36	15	2158378.64	16961511.7	931.31	14.086	10.11889	35.7	17.344	0.197	0.22172	48.4	99.4	0.296
65	37864.36	20	2158383.64	16961511.72	931.31	12.589	8.86643	35.2	15.398	0.141	0.16455	49.4	102	0.217
66	37864.36	25	2158388.64	16961511.73	931.31	11.064	7.62715	34.6	13.439	0.091	0.11552	51.6	104.6	0.147
67	37864.36	30	2158393.64	16961511.74	931.31	9.632	6.50022	34	11.62	0.052	0.07764	56.3	107.2	0.093
68	37864.36	35	2158398.64	16961511.75	931.31	8.35	5.52558	33.5	10.013	0.023	0.05025	65	109.7	0.055
69	37864.36	40	2158403.64	16961511.77	931.31	7.237	4.70584	33	8.632	0.011	0.03122	71.3	107.7	0.031
70	37864.36	45	2158408.64	16961511.78	931.31	6.286	4.02578	32.6	7.465	0.018	0.01835	46.1	89.8	0.024
71	37864.36	50	2158413.64	16961511.79	931.31	5.481	3.4644	32.3	6.484	0.025	0.00981	21.2	84.4	0.027
72	37864.36	55	2158418.64	16961511.81	931.31	4.8	3.00084	32	5.661	0.03	0.00434	8.2	86.2	0.03
73	37864.36	60	2158423.64	16961511.82	931.31	4.226	2.61673	31.8	4.97	0.033	0.00177	3.1	88.1	0.033
74	37864.36	65	2158428.64	16961511.83	931.31	3.739	2.2968	31.6	4.388	0.034	0.00274	4.6	89.4	0.034
75	37864.36	70	2158433.64	16961511.84	931.31	3.325	2.02868	31.4	3.895	0.034	0.00401	6.8	90.2	0.034
76	37864.36	75	2158438.64	16961511.86	931.31	2.972	1.80253	31.2	3.476	0.033	0.00484	8.3	90.8	0.033
77	37864.36	80	2158443.64	16961511.87	931.31	2.669	1.61052	31.1	3.117	0.032	0.00531	9.4	91.2	0.032
78	37864.36	85	2158448.64	16961511.88	931.31	2.407	1.44644	31	2.808	0.031	0.00554	10.2	91.5	0.031
79	37864.36	90	2158453.64	16961511.9	931.31	2.181	1.30535	30.9	2.541	0.029	0.0056	10.9	91.7	0.03
80	37864.36	95	2158458.64	16961511.91	931.31	1.983	1.1833	30.8	2.309	0.028	0.00555	11.3	91.8	0.028
81	37864.36	100	2158463.64	16961511.92	931.31	1.81	1.07713	30.8	2.107	0.026	0.00542	11.7	91.9	0.027
82	37864.36	105	2158468.64	16961511.93	931.31	1.659	0.98428	30.7	1.929	0.025	0.00526	12	91.9	0.025
83	37864.36	110	2158473.64	16961511.95	931.31	1.524	0.90266	30.6	1.772	0.023	0.00506	12.2	92	0.024
84	37864.36	115	2158478.64	16961511.96	931.31	1.405	0.83057	30.6	1.633	0.022	0.00486	12.4	92	0.023
85	37864.36	120	2158483.64	16961511.97	931.31	1.3	0.76663	30.5	1.509	0.021	0.00465	12.6	92	0.021
86	37864.36	125	2158488.64	16961511.99	931.31	1.205	0.70966	30.5	1.398	0.02	0.00443	12.7	92	0.02
87	37864.36	130	2158493.64	16961512	931.31	1.12	0.65871	30.5	1.299	0.019	0.00423	12.9	91.9	0.019
88	37864.36	135	2158498.64	16961512.01	931.31	1.044	0.61298	30.4	1.21	0.017	0.00403	13	91.9	0.018
89	37864.36	140	2158503.64	16961512.02	931.31	0.975	0.57178	30.4	1.13	0.017	0.00383	13	91.9	0.017
90	37864.36	145	2158508.64	16961512.04	931.31	0.912	0.53454	30.4	1.057	0.016	0.00365	13.1	91.9	0.016
91	37864.36	150	2158513.64	16961512.05	931.31	0.855	0.50079	30.4	0.991	0.015	0.00348	13.2	91.8	0.015
92	37864.36	155	2158518.64	16961512.06	931.31	0.803	0.47009	30.3	0.931	0.014	0.00331	13.2	91.8	0.014
93	37864.36	160	2158523.64	16961512.08	931.31	0.756	0.44211	30.3	0.876	0.013	0.00315	13.3	91.8	0.014
94	37864.36	165	2158528.64	16961512.09	931.31	0.713	0.41652	30.3	0.826	0.013	0.00301	13.3	91.7	0.013
95	37864.36	170	2158533.64	16961512.1	931.31	0.673	0.39308	30.3	0.78	0.012	0.00287	13.4	91.7	0.012
96	37864.36	175	2158538.64	16961512.11	931.31	0.637	0.37154	30.3	0.737	0.011	0.00274	13.4	91.7	0.012
97	37864.36	180	2158543.64	16961512.13	931.31	0.603	0.35171	30.2	0.698	0.011	0.00261	13.5	91.6	0.011
98	37864.36	185	2158548.64	16961512.14	931.31	0.572	0.33341	30.2	0.662	0.01	0.0025	13.5	91.6	0.011
99	37864.36	190	2158553.64	16961512.15	931.31	0.543	0.31649	30.2	0.629	0.01	0.00239	13.5	91.6	0.01
100	37864.36	195	2158558.64	16961512.17	931.31	0.517	0.30082	30.2	0.598	0.01	0.00229	13.5	91.6	0.01
101	37864.36	200	2158563.64	16961512.18	931.31	0.492	0.28628	30.2	0.569	0.009	0.00219	13.6	91.5	0.009
102	37864.36	205	2158568.64	16961512.19	931.31	0.469	0.27276	30.2	0.542	0.009	0.0021	13.6	91.5	0.009
103	37864.36	210	2158573.64	16961512.2	931.31	0.447	0.26017	30.2	0.517	0.008	0.00201	13.6	91.5	0.009
104	37864.36	215	2158578.64	16961512.22	931.31	0.427	0.24842	30.2	0.494	0.008	0.00193	13.6	91.4	0.008
105	37864.36	220	2158583.64	16961512.23	931.31	0.409	0.23745	30.2	0.473	0.008	0.00186	13.6	91.4	0.008
106	37864.36	225	2158588.64	16961512.24	931.31	0.391	0.22719	30.2	0.452	0.007	0.00178	13.6	91.4	0.008
107	37864.36	230	2158593.64	16961512.26	931.31	0.375	0.21758	30.2	0.433	0.007	0.00171	13.7	91.4	0.007
108	37864.36	235	2158598.64	16961512.27	931.31	0.359	0.20855	30.1	0.415	0.007	0.00165	13.7	91.3	0.007
109	37864.36	240	2158603.64	16961512.28	931.31	0.345	0.20008	30.1	0.398	0.007	0.00159	13.7	91.3	0.007

110	37864.36	245	2158608.64	16961512.29	931.31	0.331	0.19211	30.1	0.383	0.006	0.00153	13.7	91.3	0.006
111	37864.36	250	2158613.64	16961512.31	931.31	0.318	0.1846	30.1	0.368	0.006	0.00148	13.7	91.3	0.006
112	37864.36	255	2158618.64	16961512.32	931.31	0.306	0.17753	30.1	0.354	0.006	0.00142	13.7	91.3	0.006
113	37864.36	260	2158623.64	16961512.33	931.31	0.294	0.17085	30.1	0.34	0.006	0.00137	13.7	91.2	0.006
114	37864.36	265	2158628.64	16961512.35	931.31	0.284	0.16454	30.1	0.328	0.005	0.00133	13.7	91.2	0.006
115	37864.36	270	2158633.64	16961512.36	931.31	0.273	0.15857	30.1	0.316	0.005	0.00128	13.7	91.2	0.005
116	37864.36	275	2158638.64	16961512.37	931.31	0.264	0.15292	30.1	0.305	0.005	0.00124	13.7	91.2	0.005
117	37864.36	280	2158643.64	16961512.38	931.31	0.255	0.14757	30.1	0.294	0.005	0.0012	13.8	91.2	0.005
118	37864.36	285	2158648.64	16961512.4	931.31	0.246	0.14249	30.1	0.284	0.005	0.00116	13.8	91.1	0.005
119	37864.36	290	2158653.64	16961512.41	931.31	0.238	0.13767	30.1	0.275	0.005	0.00112	13.8	91.1	0.005
120	37864.36	295	2158658.64	16961512.42	931.31	0.23	0.13308	30.1	0.265	0.004	0.00109	13.8	91.1	0.005
121	37864.36	300	2158663.64	16961512.44	931.31	0.222	0.12873	30.1	0.257	0.004	0.00105	13.8	91.1	0.004

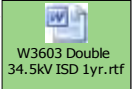
Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	50304.52	-300	2174877.09	17012818.16	884.9	0.159	0.08878	29.2	0.182	0.003	0.00084	17.4	88.9	0.003
2	50304.52	-295	2174880.12	17012814.18	884.9	0.164	0.09168	29.2	0.188	0.003	0.00087	17.4	88.9	0.003
3	50304.52	-290	2174883.16	17012810.2	884.9	0.17	0.09472	29.2	0.194	0.003	0.0009	17.3	88.9	0.003
4	50304.52	-285	2174886.19	17012806.23	884.9	0.175	0.09793	29.2	0.201	0.003	0.00093	17.3	88.9	0.003
5	50304.52	-280	2174889.22	17012802.25	884.9	0.181	0.1013	29.2	0.208	0.003	0.00096	17.3	88.8	0.003
6	50304.52	-275	2174892.25	17012798.27	884.9	0.187	0.10485	29.2	0.215	0.003	0.00099	17.3	88.8	0.003
7	50304.52	-270	2174895.28	17012794.3	884.9	0.194	0.1086	29.2	0.222	0.003	0.00103	17.3	88.8	0.003
8	50304.52	-265	2174898.31	17012790.32	884.9	0.201	0.11255	29.3	0.23	0.003	0.00106	17.3	88.8	0.004
9	50304.52	-260	2174901.34	17012786.34	884.9	0.208	0.11673	29.3	0.239	0.004	0.0011	17.3	88.8	0.004
10	50304.52	-255	2174904.37	17012782.37	884.9	0.216	0.12115	29.3	0.248	0.004	0.00114	17.3	88.8	0.004
11	50304.52	-250	2174907.4	17012778.39	884.9	0.224	0.12583	29.3	0.257	0.004	0.00118	17.3	88.7	0.004
12	50304.52	-245	2174910.43	17012774.41	884.9	0.233	0.1308	29.3	0.267	0.004	0.00123	17.3	88.7	0.004
13	50304.52	-240	2174913.47	17012770.44	884.9	0.242	0.13607	29.3	0.278	0.004	0.00127	17.3	88.7	0.004
14	50304.52	-235	2174916.5	17012766.46	884.9	0.252	0.14166	29.3	0.289	0.004	0.00132	17.3	88.7	0.004
15	50304.52	-230	2174919.53	17012762.48	884.9	0.262	0.14762	29.4	0.301	0.004	0.00138	17.3	88.6	0.005
16	50304.52	-225	2174922.56	17012758.51	884.9	0.274	0.15396	29.4	0.314	0.005	0.00143	17.3	88.6	0.005
17	50304.52	-220	2174925.59	17012754.53	884.9	0.285	0.16073	29.4	0.328	0.005	0.00149	17.3	88.6	0.005
18	50304.52	-215	2174928.62	17012750.55	884.9	0.298	0.16795	29.4	0.342	0.005	0.00155	17.3	88.6	0.005
19	50304.52	-210	2174931.65	17012746.58	884.9	0.312	0.17569	29.4	0.358	0.005	0.00162	17.3	88.5	0.005
20	50304.52	-205	2174934.68	17012742.6	884.9	0.326	0.18397	29.4	0.374	0.005	0.00169	17.3	88.5	0.006
21	50304.52	-200	2174937.71	17012738.62	884.9	0.341	0.19285	29.5	0.392	0.006	0.00176	17.3	88.5	0.006
22	50304.52	-195	2174940.74	17012734.65	884.9	0.358	0.20241	29.5	0.411	0.006	0.00184	17.3	88.5	0.006
23	50304.52	-190	2174943.77	17012730.67	884.9	0.376	0.21269	29.5	0.432	0.006	0.00193	17.3	88.4	0.006
24	50304.52	-185	2174946.81	17012726.69	884.9	0.395	0.22378	29.5	0.454	0.006	0.00202	17.3	88.4	0.007
25	50304.52	-180	2174949.84	17012722.72	884.9	0.416	0.23577	29.5	0.478	0.007	0.00212	17.3	88.4	0.007
26	50304.52	-175	2174952.87	17012718.74	884.9	0.439	0.24874	29.6	0.504	0.007	0.00222	17.2	88.3	0.007
27	50304.52	-170	2174955.9	17012714.76	884.9	0.463	0.26282	29.6	0.532	0.008	0.00233	17.2	88.3	0.008
28	50304.52	-165	2174958.93	17012710.79	884.9	0.49	0.27814	29.6	0.563	0.008	0.00245	17.2	88.3	0.008
29	50304.52	-160	2174961.96	17012706.81	884.9	0.518	0.29483	29.6	0.596	0.008	0.00257	17.2	88.2	0.009
30	50304.52	-155	2174964.99	17012702.83	884.9	0.55	0.31306	29.7	0.633	0.009	0.00271	17.2	88.2	0.009
31	50304.52	-150	2174968.02	17012698.86	884.9	0.584	0.33303	29.7	0.672	0.009	0.00285	17.2	88.2	0.01
32	50304.52	-145	2174971.05	17012694.88	884.9	0.622	0.35497	29.7	0.716	0.01	0.00301	17.2	88.1	0.01
33	50304.52	-140	2174974.08	17012690.9	884.9	0.663	0.37914	29.8	0.764	0.01	0.00317	17.1	88.1	0.011
34	50304.52	-135	2174977.12	17012686.93	884.9	0.709	0.40583	29.8	0.817	0.011	0.00335	17.1	88.1	0.011
35	50304.52	-130	2174980.15	17012682.95	884.9	0.759	0.43543	29.8	0.875	0.012	0.00353	17.1	88	0.012
36	50304.52	-125	2174983.18	17012678.97	884.9	0.815	0.46834	29.9	0.94	0.012	0.00373	17	88	0.013
37	50304.52	-120	2174986.21	17012675	884.9	0.878	0.50508	29.9	1.013	0.013	0.00395	17	88	0.014
38	50304.52	-115	2174989.24	17012671.02	884.9	0.947	0.54625	30	1.094	0.014	0.00417	16.9	88	0.014
39	50304.52	-110	2174992.27	17012667.05	884.9	1.025	0.59256	30	1.184	0.015	0.0044	16.9	88	0.015
40	50304.52	-105	2174995.3	17012663.07	884.9	1.113	0.6449	30.1	1.286	0.015	0.00465	16.8	88	0.016
41	50304.52	-100	2174998.33	17012659.09	884.9	1.212	0.70433	30.2	1.402	0.016	0.00489	16.7	88	0.017
42	50304.52	-95	2175001.36	17012655.12	884.9	1.324	0.77212	30.2	1.533	0.017	0.00514	16.5	88.1	0.018
43	50304.52	-90	2175004.39	17012651.14	884.9	1.452	0.84989	30.3	1.683	0.018	0.00537	16.3	88.2	0.019
44	50304.52	-85	2175007.43	17012647.16	884.9	1.599	0.93957	30.4	1.855	0.019	0.00557	16.1	88.3	0.02
45	50304.52	-80	2175010.46	17012643.19	884.9	1.768	1.04364	30.6	2.053	0.02	0.00573	15.8	88.5	0.021
46	50304.52	-75	2175013.49	17012639.21	884.9	1.963	1.16515	30.7	2.283	0.021	0.00579	15.3	88.8	0.022
47	50304.52	-70	2175016.52	17012635.23	884.9	2.19	1.30798	30.9	2.551	0.022	0.00572	14.7	89.2	0.023
48	50304.52	-65	2175019.55	17012631.26	884.9	2.455	1.47702	31	2.865	0.022	0.00543	13.7	89.9	0.023
49	50304.52	-60	2175022.58	17012627.28	884.9	2.766	1.67851	31.3	3.235	0.022	0.00481	12.2	91	0.023
50	50304.52	-55	2175025.61	17012623.3	884.9	3.133	1.92041	31.5	3.675	0.021	0.00372	9.9	92.7	0.022
51	50304.52	-50	2175028.64	17012619.33	884.9	3.568	2.21282	31.8	4.199	0.019	0.00223	6.6	95.5	0.019
52	50304.52	-45	2175031.67	17012615.35	884.9	4.085	2.56845	32.2	4.826	0.016	0.00306	11	100.2	0.016
53	50304.52	-40	2175034.7	17012611.37	884.9	4.7	3.00296	32.6	5.577	0.01	0.008	37.7	100	0.012
54	50304.52	-35	2175037.73	17012607.4	884.9	5.428	3.53473	33.1	6.478	0.007	0.01625	65.3	62.3	0.017



55	50304.52	-30	2175040.77	17012603.42	884.9	6.286	4.18332	33.6	7.551	0.019	0.02888	56.6	66.8	0.034
56	50304.52	-25	2175043.8	17012599.44	884.9	7.279	4.96481	34.3	8.811	0.04	0.0475	50	71.5	0.062
57	50304.52	-20	2175046.83	17012595.47	884.9	8.394	5.88129	35	10.249	0.068	0.07361	47.2	74.9	0.1
58	50304.52	-15	2175049.86	17012591.49	884.9	9.581	6.90108	35.8	11.808	0.103	0.10756	46.2	77.8	0.149
59	50304.52	-10	2175052.89	17012587.51	884.9	10.732	7.93123	36.5	13.345	0.141	0.14644	46.1	80.9	0.203
60	50304.52	-5	2175055.92	17012583.54	884.9	11.669	8.79951	37	14.615	0.174	0.18232	46.3	84.4	0.252
61	50304.52	0	2175058.95	17012579.56	884.9	12.182	9.28758	37.3	15.319	0.194	0.20337	46.4	88.3	0.281
62	50304.52	5	2175061.98	17012575.58	884.9	12.127	9.23971	37.3	15.246	0.192	0.20063	46.3	92.4	0.278
63	50304.52	10	2175065.01	17012571.61	884.9	11.52	8.67239	37	14.42	0.17	0.17523	45.9	96.3	0.244
64	50304.52	15	2175068.04	17012567.63	884.9	10.527	7.76159	36.4	13.079	0.135	0.13747	45.5	99.7	0.193
65	50304.52	20	2175071.08	17012563.65	884.9	9.358	6.72341	35.7	11.522	0.097	0.09882	45.4	102.8	0.139
66	50304.52	25	2175074.11	17012559.68	884.9	8.177	5.71672	35	9.977	0.064	0.06622	46.2	105.8	0.092
67	50304.52	30	2175077.14	17012555.7	884.9	7.082	4.82212	34.3	8.568	0.036	0.04169	48.8	109.6	0.055
68	50304.52	35	2175080.17	17012551.72	884.9	6.114	4.06374	33.6	7.341	0.017	0.02451	55.3	115.4	0.03
69	50304.52	40	2175083.2	17012547.75	884.9	5.281	3.4361	33.1	6.3	0.007	0.01303	61.8	121.9	0.013
70	50304.52	45	2175086.23	17012543.77	884.9	4.574	2.92203	32.6	5.428	0.011	0.00575	28	72.8	0.011
71	50304.52	50	2175089.26	17012539.79	884.9	3.979	2.50198	32.2	4.7	0.016	0.00222	7.9	79.7	0.016
72	50304.52	55	2175092.29	17012535.82	884.9	3.478	2.15797	31.8	4.093	0.019	0.00323	9.5	84.8	0.019
73	50304.52	60	2175095.32	17012531.84	884.9	3.056	1.87486	31.5	3.585	0.021	0.0047	12.6	87.5	0.022
74	50304.52	65	2175098.35	17012527.86	884.9	2.7	1.6404	31.3	3.159	0.022	0.0056	14.4	89.2	0.023
75	50304.52	70	2175101.39	17012523.89	884.9	2.398	1.44488	31.1	2.8	0.022	0.00606	15.5	90.2	0.023
76	50304.52	75	2175104.42	17012519.91	884.9	2.141	1.28066	30.9	2.495	0.021	0.00622	16.2	90.8	0.022
77	50304.52	80	2175107.45	17012515.93	884.9	1.92	1.14176	30.7	2.234	0.021	0.0062	16.7	91.2	0.022
78	50304.52	85	2175110.48	17012511.96	884.9	1.731	1.02346	30.6	2.011	0.02	0.00605	17	91.5	0.021
79	50304.52	90	2175113.51	17012507.98	884.9	1.566	0.92205	30.5	1.818	0.019	0.00584	17.2	91.7	0.02
80	50304.52	95	2175116.54	17012504.01	884.9	1.423	0.83456	30.4	1.65	0.018	0.00559	17.3	91.8	0.019
81	50304.52	100	2175119.57	17012500.03	884.9	1.299	0.75864	30.3	1.504	0.017	0.00532	17.4	91.9	0.018
82	50304.52	105	2175122.6	17012496.05	884.9	1.189	0.69239	30.2	1.376	0.016	0.00504	17.5	92	0.017
83	50304.52	110	2175125.63	17012492.08	884.9	1.092	0.63429	30.1	1.263	0.015	0.00477	17.5	92	0.016
84	50304.52	115	2175128.66	17012488.1	884.9	1.007	0.58307	30.1	1.163	0.014	0.00451	17.6	92	0.015
85	50304.52	120	2175131.69	17012484.12	884.9	0.93	0.53771	30	1.075	0.013	0.00426	17.6	92	0.014
86	50304.52	125	2175134.73	17012480.15	884.9	0.862	0.49737	30	0.995	0.013	0.00402	17.6	92	0.013
87	50304.52	130	2175137.76	17012476.17	884.9	0.801	0.46135	29.9	0.925	0.012	0.0038	17.6	92	0.013
88	50304.52	135	2175140.79	17012472.19	884.9	0.746	0.42907	29.9	0.861	0.011	0.00359	17.6	91.9	0.012
89	50304.52	140	2175143.82	17012468.22	884.9	0.697	0.40002	29.9	0.804	0.011	0.0034	17.7	91.9	0.011
90	50304.52	145	2175146.85	17012464.24	884.9	0.652	0.37381	29.8	0.752	0.01	0.00321	17.7	91.9	0.011
91	50304.52	150	2175149.88	17012460.26	884.9	0.612	0.35007	29.8	0.705	0.01	0.00304	17.7	91.9	0.01
92	50304.52	155	2175152.91	17012456.29	884.9	0.575	0.32851	29.8	0.662	0.009	0.00288	17.7	91.8	0.01
93	50304.52	160	2175155.94	17012452.31	884.9	0.541	0.30888	29.7	0.623	0.009	0.00273	17.7	91.8	0.009
94	50304.52	165	2175158.97	17012448.33	884.9	0.51	0.29095	29.7	0.587	0.008	0.0026	17.7	91.8	0.009
95	50304.52	170	2175162	17012444.36	884.9	0.482	0.27453	29.7	0.554	0.008	0.00247	17.6	91.7	0.008
96	50304.52	175	2175165.04	17012440.38	884.9	0.456	0.25946	29.7	0.524	0.007	0.00235	17.6	91.7	0.008
97	50304.52	180	2175168.07	17012436.4	884.9	0.432	0.2456	29.6	0.497	0.007	0.00223	17.6	91.7	0.007
98	50304.52	185	2175171.1	17012432.43	884.9	0.41	0.23282	29.6	0.471	0.007	0.00213	17.6	91.6	0.007
99	50304.52	190	2175174.13	17012428.45	884.9	0.389	0.22102	29.6	0.448	0.006	0.00203	17.6	91.6	0.007
100	50304.52	195	2175177.16	17012424.47	884.9	0.37	0.21009	29.6	0.426	0.006	0.00194	17.6	91.6	0.006
101	50304.52	200	2175180.19	17012420.5	884.9	0.353	0.19996	29.6	0.405	0.006	0.00185	17.6	91.5	0.006
102	50304.52	205	2175183.22	17012416.52	884.9	0.336	0.19054	29.5	0.386	0.006	0.00177	17.6	91.5	0.006
103	50304.52	210	2175186.25	17012412.54	884.9	0.321	0.18178	29.5	0.369	0.005	0.00169	17.6	91.5	0.006
104	50304.52	215	2175189.28	17012408.57	884.9	0.307	0.17362	29.5	0.352	0.005	0.00162	17.6	91.5	0.005
105	50304.52	220	2175192.31	17012404.59	884.9	0.293	0.166	29.5	0.337	0.005	0.00156	17.6	91.4	0.005
106	50304.52	225	2175195.35	17012400.61	884.9	0.281	0.15887	29.5	0.323	0.005	0.00149	17.6	91.4	0.005
107	50304.52	230	2175198.38	17012396.64	884.9	0.269	0.15219	29.5	0.309	0.005	0.00143	17.6	91.4	0.005
108	50304.52	235	2175201.41	17012392.66	884.9	0.258	0.14594	29.5	0.297	0.004	0.00138	17.6	91.4	0.005
109	50304.52	240	2175204.44	17012388.68	884.9	0.248	0.14006	29.4	0.285	0.004	0.00132	17.6	91.3	0.004

110	50304.52	245	2175207.47	17012384.71	884.9	0.238	0.13454	29.4	0.274	0.004	0.00127	17.6	91.3	0.004
111	50304.52	250	2175210.5	17012380.73	884.9	0.229	0.12934	29.4	0.263	0.004	0.00123	17.6	91.3	0.004
112	50304.52	255	2175213.53	17012376.75	884.9	0.221	0.12444	29.4	0.253	0.004	0.00118	17.6	91.3	0.004
113	50304.52	260	2175216.56	17012372.78	884.9	0.213	0.11982	29.4	0.244	0.004	0.00114	17.6	91.2	0.004
114	50304.52	265	2175219.59	17012368.8	884.9	0.205	0.11546	29.4	0.235	0.003	0.0011	17.6	91.2	0.004
115	50304.52	270	2175222.62	17012364.82	884.9	0.198	0.11133	29.4	0.227	0.003	0.00106	17.6	91.2	0.004
116	50304.52	275	2175225.65	17012360.85	884.9	0.191	0.10742	29.4	0.219	0.003	0.00102	17.6	91.2	0.003
117	50304.52	280	2175228.69	17012356.87	884.9	0.184	0.10373	29.4	0.212	0.003	0.00099	17.6	91.2	0.003
118	50304.52	285	2175231.72	17012352.89	884.9	0.178	0.10022	29.3	0.205	0.003	0.00096	17.6	91.1	0.003
119	50304.52	290	2175234.75	17012348.92	884.9	0.172	0.09689	29.3	0.198	0.003	0.00092	17.6	91.1	0.003
120	50304.52	295	2175237.78	17012344.94	884.9	0.167	0.09373	29.3	0.191	0.003	0.00089	17.6	91.1	0.003
121	50304.52	300	2175240.81	17012340.97	884.9	0.162	0.09072	29.3	0.185	0.003	0.00087	17.6	91.1	0.003

Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	11754.53	-300	2165527.8	16978343.73	789.3	0.266	0.15389	30.1	0.307	0.004	0.00102	13.3	88.9	0.004
2	11754.53	-295	2165532.8	16978343.85	789.3	0.274	0.1591	30.1	0.317	0.004	0.00105	13.3	88.9	0.005
3	11754.53	-290	2165537.8	16978343.97	789.3	0.284	0.16457	30.1	0.328	0.005	0.00108	13.3	88.9	0.005
4	11754.53	-285	2165542.79	16978344.08	789.3	0.294	0.17032	30.1	0.34	0.005	0.00112	13.3	88.9	0.005
5	11754.53	-280	2165547.79	16978344.2	789.3	0.304	0.17638	30.1	0.352	0.005	0.00115	13.2	88.8	0.005
6	11754.53	-275	2165552.79	16978344.31	789.3	0.315	0.18277	30.1	0.364	0.005	0.00119	13.2	88.8	0.005
7	11754.53	-270	2165557.79	16978344.43	789.3	0.327	0.18951	30.1	0.378	0.005	0.00123	13.2	88.8	0.005
8	11754.52	-265	2165562.79	16978344.54	789.3	0.339	0.19663	30.1	0.392	0.005	0.00128	13.2	88.8	0.006
9	11754.52	-260	2165567.79	16978344.66	789.3	0.352	0.20416	30.1	0.407	0.006	0.00132	13.2	88.8	0.006
10	11754.52	-255	2165572.79	16978344.77	789.3	0.365	0.21213	30.1	0.423	0.006	0.00137	13.2	88.8	0.006
11	11754.52	-250	2165577.78	16978344.89	789.3	0.38	0.22056	30.1	0.439	0.006	0.00142	13.2	88.7	0.006
12	11754.52	-245	2165582.78	16978345.01	789.3	0.395	0.22951	30.1	0.457	0.006	0.00147	13.2	88.7	0.006
13	11754.52	-240	2165587.78	16978345.12	789.3	0.412	0.23901	30.1	0.476	0.007	0.00152	13.2	88.7	0.007
14	11754.52	-235	2165592.78	16978345.24	789.3	0.429	0.24911	30.2	0.496	0.007	0.00158	13.1	88.7	0.007
15	11754.52	-230	2165597.78	16978345.35	789.3	0.447	0.25987	30.2	0.517	0.007	0.00164	13.1	88.6	0.007
16	11754.52	-225	2165602.78	16978345.47	789.3	0.467	0.27132	30.2	0.54	0.007	0.00171	13.1	88.6	0.008
17	11754.52	-220	2165607.78	16978345.58	789.3	0.488	0.28355	30.2	0.564	0.008	0.00177	13.1	88.6	0.008
18	11754.52	-215	2165612.78	16978345.7	789.3	0.51	0.29661	30.2	0.59	0.008	0.00185	13.1	88.6	0.008
19	11754.52	-210	2165617.77	16978345.81	789.3	0.534	0.3106	30.2	0.618	0.008	0.00192	13	88.5	0.009
20	11754.52	-205	2165622.77	16978345.93	789.3	0.559	0.32559	30.2	0.647	0.009	0.002	13	88.5	0.009
21	11754.51	-200	2165627.77	16978346.05	789.3	0.587	0.34168	30.2	0.679	0.009	0.00209	13	88.5	0.009
22	11754.51	-195	2165632.77	16978346.16	789.3	0.616	0.35898	30.2	0.713	0.009	0.00218	13	88.5	0.01
23	11754.51	-190	2165637.77	16978346.28	789.3	0.648	0.37762	30.2	0.75	0.01	0.00227	12.9	88.4	0.01
24	11754.51	-185	2165642.77	16978346.39	789.3	0.682	0.39773	30.2	0.79	0.01	0.00237	12.9	88.4	0.011
25	11754.51	-180	2165647.77	16978346.51	789.3	0.719	0.41948	30.3	0.832	0.011	0.00248	12.8	88.4	0.011
26	11754.51	-175	2165652.76	16978346.62	789.3	0.759	0.44304	30.3	0.879	0.011	0.00259	12.8	88.3	0.012
27	11754.51	-170	2165657.76	16978346.74	789.3	0.802	0.46862	30.3	0.929	0.012	0.00271	12.8	88.3	0.012
28	11754.51	-165	2165662.76	16978346.85	789.3	0.849	0.49645	30.3	0.984	0.013	0.00283	12.7	88.3	0.013
29	11754.51	-160	2165667.76	16978346.97	789.3	0.901	0.5268	30.3	1.043	0.013	0.00296	12.6	88.3	0.014
30	11754.51	-155	2165672.76	16978347.09	789.3	0.957	0.55998	30.3	1.108	0.014	0.0031	12.6	88.2	0.014
31	11754.51	-150	2165677.76	16978347.2	789.3	1.018	0.59636	30.4	1.18	0.015	0.00325	12.5	88.2	0.015
32	11754.51	-145	2165682.76	16978347.32	789.3	1.085	0.63633	30.4	1.258	0.015	0.0034	12.4	88.2	0.016
33	11754.51	-140	2165687.76	16978347.43	789.3	1.159	0.6804	30.4	1.344	0.016	0.00356	12.3	88.2	0.017
34	11754.5	-135	2165692.75	16978347.55	789.3	1.24	0.72911	30.4	1.439	0.017	0.00372	12.2	88.1	0.018
35	11754.5	-130	2165697.75	16978347.66	789.3	1.33	0.78314	30.5	1.544	0.018	0.00388	12.1	88.1	0.019
36	11754.5	-125	2165702.75	16978347.78	789.3	1.43	0.84327	30.5	1.661	0.019	0.00405	11.9	88.1	0.02
37	11754.5	-120	2165707.75	16978347.9	789.3	1.542	0.91042	30.6	1.791	0.02	0.00422	11.7	88.1	0.021
38	11754.5	-115	2165712.75	16978348.01	789.3	1.666	0.98571	30.6	1.936	0.021	0.00437	11.5	88.1	0.022
39	11754.5	-110	2165717.75	16978348.13	789.3	1.806	1.07047	30.7	2.099	0.023	0.00451	11.2	88.1	0.023
40	11754.5	-105	2165722.75	16978348.24	789.3	1.963	1.16629	30.7	2.283	0.024	0.00463	10.9	88.2	0.024
41	11754.5	-100	2165727.74	16978348.36	789.3	2.141	1.2751	30.8	2.492	0.025	0.00471	10.5	88.3	0.026
42	11754.5	-95	2165732.74	16978348.47	789.3	2.342	1.39926	30.9	2.728	0.027	0.00472	10	88.4	0.027
43	11754.5	-90	2165737.74	16978348.59	789.3	2.572	1.54165	30.9	2.999	0.028	0.00464	9.4	88.5	0.028
44	11754.5	-85	2165742.74	16978348.7	789.3	2.835	1.70582	31	3.309	0.029	0.00442	8.6	88.7	0.03
45	11754.5	-80	2165747.74	16978348.82	789.3	3.137	1.89615	31.1	3.666	0.03	0.00401	7.6	89.1	0.03
46	11754.5	-75	2165752.74	16978348.94	789.3	3.487	2.11806	31.3	4.08	0.031	0.00332	6.1	89.5	0.031
47	11754.49	-70	2165757.74	16978349.05	789.3	3.892	2.37833	31.4	4.561	0.031	0.0023	4.2	90.2	0.031
48	11754.49	-65	2165762.74	16978349.17	789.3	4.365	2.68533	31.6	5.125	0.031	0.00138	2.6	91.1	0.031
49	11754.49	-60	2165767.73	16978349.28	789.3	4.917	3.0495	31.8	5.786	0.029	0.0031	6	92.5	0.029
50	11754.49	-55	2165772.73	16978349.4	789.3	5.565	3.48361	32	6.566	0.026	0.00706	15.1	94.1	0.027
51	11754.49	-50	2165777.73	16978349.51	789.3	6.326	4.00307	32.3	7.486	0.021	0.01315	32.4	93.8	0.024
52	11754.49	-45	2165782.73	16978349.63	789.3	7.218	4.6257	32.7	8.573	0.013	0.02216	59.5	83	0.024
53	11754.49	-40	2165787.73	16978349.74	789.3	8.259	5.37074	33	9.852	0.011	0.03527	73.3	72.3	0.036
54	11754.49	-35	2165792.73	16978349.86	789.3	9.462	6.25571	33.5	11.343	0.027	0.05403	63.4	72.4	0.06



55	11754.49	-30	2165797.73	16978349.98	789.3	10.826	7.28999	34	13.052	0.054	0.08016	55.8	74.5	0.097
56	11754.49	-25	2165802.72	16978350.09	789.3	12.326	8.46287	34.5	14.952	0.091	0.11509	51.7	76.8	0.147
57	11754.49	-20	2165807.72	16978350.21	789.3	13.894	9.72642	35	16.96	0.135	0.15877	49.6	79	0.208
58	11754.49	-15	2165812.72	16978350.32	789.3	15.408	10.97878	35.5	18.919	0.183	0.2081	48.7	81.4	0.277
59	11754.49	-10	2165817.72	16978350.44	789.3	16.695	12.06443	35.9	20.598	0.228	0.25571	48.3	84.1	0.343
60	11754.48	-5	2165822.72	16978350.55	789.3	17.566	12.80821	36.1	21.74	0.261	0.29099	48.1	87	0.391
61	11754.48	0	2165827.72	16978350.67	789.3	17.877	13.07436	36.2	22.148	0.273	0.30417	48.1	90	0.409
62	11754.48	5	2165832.72	16978350.78	789.3	17.572	12.8127	36.1	21.747	0.261	0.29127	48.1	93	0.391
63	11754.48	10	2165837.72	16978350.9	789.3	16.705	12.07287	35.9	20.611	0.229	0.2562	48.3	95.9	0.343
64	11754.48	15	2165842.71	16978351.02	789.3	15.422	10.99002	35.5	18.937	0.184	0.20868	48.6	98.5	0.278
65	11754.48	20	2165847.71	16978351.13	789.3	13.91	9.73895	35	16.98	0.136	0.15934	49.6	100.9	0.209
66	11754.48	25	2165852.71	16978351.25	789.3	12.342	8.47536	34.5	14.972	0.091	0.11558	51.7	103.2	0.147
67	11754.48	30	2165857.71	16978351.36	789.3	10.841	7.30156	34	13.071	0.055	0.08055	55.7	105.4	0.097
68	11754.48	35	2165862.71	16978351.48	789.3	9.476	6.26596	33.5	11.36	0.027	0.05432	63.2	107.6	0.06
69	11754.48	40	2165867.71	16978351.59	789.3	8.271	5.37958	33	9.867	0.011	0.03548	73.3	107.7	0.036
70	11754.48	45	2165872.71	16978351.71	789.3	7.228	4.63322	32.7	8.586	0.013	0.02231	59.9	97.3	0.024
71	11754.48	50	2165877.7	16978351.82	789.3	6.335	4.00941	32.3	7.497	0.021	0.01326	32.8	86.3	0.024
72	11754.48	55	2165882.7	16978351.94	789.3	5.573	3.48896	32	6.575	0.026	0.00714	15.4	85.9	0.027
73	11754.47	60	2165887.7	16978352.06	789.3	4.924	3.05401	31.8	5.794	0.029	0.00315	6.2	87.5	0.029
74	11754.47	65	2165892.7	16978352.17	789.3	4.371	2.68915	31.6	5.132	0.031	0.00138	2.6	88.8	0.031
75	11754.47	70	2165897.7	16978352.29	789.3	3.897	2.38157	31.4	4.567	0.031	0.00227	4.2	89.8	0.031
76	11754.47	75	2165902.7	16978352.4	789.3	3.491	2.12083	31.3	4.085	0.031	0.0033	6.1	90.5	0.031
77	11754.47	80	2165907.7	16978352.52	789.3	3.141	1.89852	31.1	3.67	0.03	0.00399	7.5	90.9	0.03
78	11754.47	85	2165912.7	16978352.63	789.3	2.838	1.70787	31	3.313	0.029	0.00441	8.6	91.3	0.029
79	11754.47	90	2165917.69	16978352.75	789.3	2.575	1.54343	30.9	3.002	0.028	0.00463	9.4	91.5	0.028
80	11754.47	95	2165922.69	16978352.86	789.3	2.345	1.40081	30.9	2.731	0.027	0.00471	10	91.6	0.027
81	11754.47	100	2165927.69	16978352.98	789.3	2.143	1.27646	30.8	2.494	0.025	0.0047	10.5	91.7	0.026
82	11754.47	105	2165932.69	16978353.1	789.3	1.965	1.16748	30.7	2.286	0.024	0.00463	10.9	91.8	0.024
83	11754.47	110	2165937.69	16978353.21	789.3	1.808	1.07153	30.7	2.101	0.023	0.00451	11.2	91.9	0.023
84	11754.47	115	2165942.69	16978353.33	789.3	1.668	0.98665	30.6	1.938	0.022	0.00437	11.5	91.9	0.022
85	11754.47	120	2165947.69	16978353.44	789.3	1.543	0.91126	30.6	1.792	0.02	0.00421	11.7	91.9	0.021
86	11754.46	125	2165952.68	16978353.56	789.3	1.432	0.84401	30.5	1.662	0.019	0.00405	11.9	91.9	0.02
87	11754.46	130	2165957.68	16978353.67	789.3	1.332	0.78381	30.5	1.545	0.018	0.00388	12	91.9	0.019
88	11754.46	135	2165962.68	16978353.79	789.3	1.241	0.72971	30.5	1.44	0.017	0.00372	12.2	91.9	0.018
89	11754.46	140	2165967.68	16978353.9	789.3	1.16	0.68094	30.4	1.345	0.016	0.00356	12.3	91.8	0.017
90	11754.46	145	2165972.68	16978354.02	789.3	1.086	0.63683	30.4	1.259	0.015	0.0034	12.4	91.8	0.016
91	11754.46	150	2165977.68	16978354.14	789.3	1.019	0.59681	30.4	1.18	0.015	0.00325	12.5	91.8	0.015
92	11754.46	155	2165982.68	16978354.25	789.3	0.957	0.5604	30.3	1.109	0.014	0.0031	12.6	91.8	0.014
93	11754.46	160	2165987.68	16978354.37	789.3	0.901	0.52718	30.3	1.044	0.013	0.00296	12.6	91.7	0.014
94	11754.46	165	2165992.67	16978354.48	789.3	0.85	0.49679	30.3	0.984	0.013	0.00283	12.7	91.7	0.013
95	11754.46	170	2165997.67	16978354.6	789.3	0.803	0.46893	30.3	0.93	0.012	0.00271	12.7	91.7	0.012
96	11754.46	175	2166002.67	16978354.71	789.3	0.759	0.44333	30.3	0.879	0.011	0.00259	12.8	91.7	0.012
97	11754.46	180	2166007.67	16978354.83	789.3	0.719	0.41974	30.3	0.833	0.011	0.00248	12.8	91.6	0.011
98	11754.46	185	2166012.67	16978354.94	789.3	0.683	0.39798	30.2	0.79	0.01	0.00237	12.9	91.6	0.011
99	11754.45	190	2166017.67	16978355.06	789.3	0.648	0.37785	30.2	0.75	0.01	0.00227	12.9	91.6	0.01
100	11754.45	195	2166022.67	16978355.18	789.3	0.617	0.35919	30.2	0.714	0.009	0.00218	12.9	91.5	0.01
101	11754.45	200	2166027.66	16978355.29	789.3	0.587	0.34187	30.2	0.679	0.009	0.00209	13	91.5	0.009
102	11754.45	205	2166032.66	16978355.41	789.3	0.56	0.32577	30.2	0.648	0.009	0.002	13	91.5	0.009
103	11754.45	210	2166037.66	16978355.52	789.3	0.534	0.31077	30.2	0.618	0.008	0.00192	13	91.5	0.009
104	11754.45	215	2166042.66	16978355.64	789.3	0.51	0.29678	30.2	0.59	0.008	0.00185	13.1	91.4	0.008
105	11754.45	220	2166047.66	16978355.75	789.3	0.488	0.2837	30.2	0.564	0.008	0.00177	13.1	91.4	0.008
106	11754.45	225	2166052.66	16978355.87	789.3	0.467	0.27146	30.2	0.54	0.007	0.00171	13.1	91.4	0.008
107	11754.45	230	2166057.66	16978355.98	789.3	0.447	0.26	30.2	0.517	0.007	0.00164	13.1	91.4	0.007
108	11754.45	235	2166062.66	16978356.1	789.3	0.429	0.24924	30.2	0.496	0.007	0.00158	13.1	91.3	0.007
109	11754.45	240	2166067.65	16978356.22	789.3	0.412	0.23913	30.1	0.476	0.007	0.00152	13.1	91.3	0.007

110	11754.45	245	2166072.65	16978356.33	789.3	0.395	0.22962	30.1	0.457	0.006	0.00147	13.2	91.3	0.006
111	11754.45	250	2166077.65	16978356.45	789.3	0.38	0.22067	30.1	0.44	0.006	0.00142	13.2	91.3	0.006
112	11754.44	255	2166082.65	16978356.56	789.3	0.366	0.21222	30.1	0.423	0.006	0.00137	13.2	91.2	0.006
113	11754.44	260	2166087.65	16978356.68	789.3	0.352	0.20425	30.1	0.407	0.006	0.00132	13.2	91.2	0.006
114	11754.44	265	2166092.65	16978356.79	789.3	0.339	0.19672	30.1	0.392	0.005	0.00128	13.2	91.2	0.006
115	11754.44	270	2166097.65	16978356.91	789.3	0.327	0.1896	30.1	0.378	0.005	0.00123	13.2	91.2	0.005
116	11754.44	275	2166102.64	16978357.02	789.3	0.315	0.18285	30.1	0.364	0.005	0.00119	13.2	91.2	0.005
117	11754.44	280	2166107.64	16978357.14	789.3	0.304	0.17646	30.1	0.352	0.005	0.00115	13.2	91.2	0.005
118	11754.44	285	2166112.64	16978357.26	789.3	0.294	0.17039	30.1	0.34	0.005	0.00112	13.3	91.1	0.005
119	11754.44	290	2166117.64	16978357.37	789.3	0.284	0.16463	30.1	0.328	0.005	0.00108	13.3	91.1	0.005
120	11754.44	295	2166122.64	16978357.49	789.3	0.275	0.15916	30.1	0.317	0.004	0.00105	13.3	91.1	0.005
121	11754.44	300	2166127.64	16978357.6	789.3	0.266	0.15395	30.1	0.307	0.004	0.00102	13.3	91.1	0.004

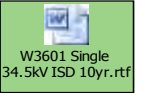
Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	52059.09	-300	2174075.43	17012228.98	836.32	0.19	0.11044	30.2	0.22	0.003	0.001	18.4	88.9	0.003
2	52059.09	-295	2174080.43	17012229.11	836.32	0.196	0.11393	30.2	0.227	0.003	0.00103	18.4	88.9	0.003
3	52059.09	-290	2174085.43	17012229.23	836.32	0.202	0.1176	30.2	0.234	0.003	0.00107	18.4	88.9	0.003
4	52059.09	-285	2174090.43	17012229.36	836.32	0.209	0.12147	30.2	0.242	0.003	0.0011	18.4	88.9	0.003
5	52059.09	-280	2174095.43	17012229.48	836.32	0.216	0.12553	30.2	0.25	0.003	0.00114	18.4	88.9	0.004
6	52059.09	-275	2174100.43	17012229.61	836.32	0.223	0.12982	30.2	0.258	0.004	0.00118	18.4	88.8	0.004
7	52059.09	-270	2174105.42	17012229.73	836.32	0.231	0.13434	30.2	0.267	0.004	0.00122	18.4	88.8	0.004
8	52059.09	-265	2174110.42	17012229.86	836.32	0.239	0.13911	30.2	0.276	0.004	0.00126	18.4	88.8	0.004
9	52059.09	-260	2174115.42	17012229.98	836.32	0.247	0.14414	30.2	0.286	0.004	0.0013	18.4	88.8	0.004
10	52059.09	-255	2174120.42	17012230.11	836.32	0.257	0.14947	30.2	0.297	0.004	0.00135	18.4	88.8	0.004
11	52059.09	-250	2174125.42	17012230.23	836.32	0.266	0.15512	30.2	0.308	0.004	0.0014	18.4	88.8	0.004
12	52059.09	-245	2174130.42	17012230.36	836.32	0.276	0.1611	30.2	0.32	0.004	0.00145	18.4	88.7	0.005
13	52059.09	-240	2174135.41	17012230.48	836.32	0.287	0.16744	30.2	0.332	0.005	0.00151	18.4	88.7	0.005
14	52059.09	-235	2174140.41	17012230.61	836.32	0.299	0.17418	30.3	0.346	0.005	0.00157	18.4	88.7	0.005
15	52059.09	-230	2174145.41	17012230.73	836.32	0.311	0.18136	30.3	0.36	0.005	0.00163	18.4	88.7	0.005
16	52059.09	-225	2174150.41	17012230.86	836.32	0.324	0.18899	30.3	0.375	0.005	0.00169	18.4	88.6	0.005
17	52059.09	-220	2174155.41	17012230.98	836.32	0.338	0.19714	30.3	0.391	0.005	0.00176	18.4	88.6	0.006
18	52059.09	-215	2174160.41	17012231.1	836.32	0.352	0.20584	30.3	0.408	0.006	0.00183	18.4	88.6	0.006
19	52059.09	-210	2174165.41	17012231.23	836.32	0.368	0.21514	30.3	0.426	0.006	0.00191	18.4	88.6	0.006
20	52059.09	-205	2174170.4	17012231.35	836.32	0.385	0.2251	30.3	0.446	0.006	0.00199	18.4	88.6	0.006
21	52059.09	-200	2174175.4	17012231.48	836.32	0.403	0.23579	30.3	0.467	0.006	0.00208	18.4	88.5	0.007
22	52059.09	-195	2174180.4	17012231.6	836.32	0.422	0.24727	30.3	0.489	0.007	0.00217	18.4	88.5	0.007
23	52059.09	-190	2174185.4	17012231.73	836.32	0.443	0.25963	30.4	0.514	0.007	0.00226	18.4	88.5	0.007
24	52059.09	-185	2174190.4	17012231.85	836.32	0.466	0.27295	30.4	0.54	0.007	0.00237	18.4	88.5	0.008
25	52059.09	-180	2174195.4	17012231.98	836.32	0.49	0.28734	30.4	0.568	0.007	0.00248	18.4	88.4	0.008
26	52059.09	-175	2174200.39	17012232.1	836.32	0.516	0.30292	30.4	0.598	0.008	0.00259	18.4	88.4	0.008
27	52059.09	-170	2174205.39	17012232.23	836.32	0.544	0.31981	30.4	0.631	0.008	0.00272	18.4	88.4	0.009
28	52059.09	-165	2174210.39	17012232.35	836.32	0.575	0.33816	30.5	0.667	0.009	0.00285	18.4	88.4	0.009
29	52059.09	-160	2174215.39	17012232.48	836.32	0.608	0.35816	30.5	0.706	0.009	0.00299	18.4	88.3	0.009
30	52059.09	-155	2174220.39	17012232.6	836.32	0.645	0.37999	30.5	0.748	0.009	0.00314	18.4	88.3	0.01
31	52059.09	-150	2174225.39	17012232.73	836.32	0.684	0.40388	30.6	0.795	0.01	0.00329	18.3	88.3	0.01
32	52059.09	-145	2174230.39	17012232.85	836.32	0.728	0.43011	30.6	0.845	0.01	0.00346	18.3	88.3	0.011
33	52059.09	-140	2174235.38	17012232.98	836.32	0.775	0.45896	30.6	0.901	0.011	0.00364	18.3	88.3	0.012
34	52059.09	-135	2174240.38	17012233.1	836.32	0.828	0.49081	30.7	0.962	0.012	0.00382	18.3	88.2	0.012
35	52059.09	-130	2174245.38	17012233.23	836.32	0.886	0.52606	30.7	1.03	0.012	0.00402	18.3	88.2	0.013
36	52059.09	-125	2174250.38	17012233.35	836.32	0.95	0.56521	30.8	1.105	0.013	0.00422	18.2	88.2	0.013
37	52059.09	-120	2174255.38	17012233.48	836.32	1.021	0.60883	30.8	1.188	0.013	0.00443	18.2	88.3	0.014
38	52059.09	-115	2174260.38	17012233.6	836.32	1.1	0.65763	30.9	1.281	0.014	0.00464	18.1	88.3	0.015
39	52059.09	-110	2174265.37	17012233.72	836.32	1.188	0.71241	30.9	1.385	0.015	0.00486	18.1	88.3	0.016
40	52059.09	-105	2174270.37	17012233.85	836.32	1.287	0.77416	31	1.502	0.016	0.00507	18	88.4	0.016
41	52059.09	-100	2174275.37	17012233.97	836.32	1.398	0.84405	31.1	1.633	0.016	0.00527	17.8	88.5	0.017
42	52059.09	-95	2174280.37	17012234.1	836.32	1.524	0.92353	31.2	1.782	0.017	0.00544	17.7	88.6	0.018
43	52059.09	-90	2174285.37	17012234.22	836.32	1.666	1.01433	31.3	1.951	0.018	0.00557	17.4	88.8	0.019
44	52059.09	-85	2174290.37	17012234.35	836.32	1.828	1.11857	31.5	2.143	0.018	0.00563	17.1	89.1	0.019
45	52059.09	-80	2174295.36	17012234.47	836.32	2.013	1.23885	31.6	2.364	0.019	0.00559	16.6	89.5	0.02
46	52059.09	-75	2174300.36	17012234.6	836.32	2.225	1.37839	31.8	2.618	0.019	0.00538	15.8	90.1	0.02
47	52059.09	-70	2174305.36	17012234.72	836.32	2.469	1.54112	32	2.911	0.019	0.00495	14.7	91	0.019
48	52059.09	-65	2174310.36	17012234.85	836.32	2.751	1.73191	32.2	3.251	0.018	0.00417	12.9	92.3	0.019
49	52059.09	-60	2174315.36	17012234.97	836.32	3.077	1.95677	32.5	3.647	0.017	0.00297	10.1	94.5	0.017
50	52059.09	-55	2174320.36	17012235.1	836.32	3.456	2.22301	32.8	4.109	0.014	0.00173	6.9	98.2	0.014
51	52059.09	-50	2174325.36	17012235.22	836.32	3.896	2.53941	33.1	4.65	0.011	0.00348	18.2	103.8	0.011
52	52059.09	-45	2174330.35	17012235.35	836.32	4.406	2.91626	33.5	5.284	0.006	0.00817	53.6	78.4	0.008
53	52059.09	-40	2174335.35	17012235.47	836.32	4.996	3.36488	34	6.024	0.008	0.01537	62.6	64	0.017
54	52059.09	-35	2174340.35	17012235.6	836.32	5.674	3.89645	34.5	6.883	0.019	0.02582	53.2	69.7	0.032



55	52059.09	-30	2174345.35	17012235.72	836.32	6.44	4.51915	35.1	7.867	0.036	0.04051	48.5	73.6	0.054
56	52059.09	-25	2174350.35	17012235.85	836.32	7.285	5.23267	35.7	8.97	0.057	0.06037	46.5	76.3	0.083
57	52059.09	-20	2174355.35	17012235.97	836.32	8.183	6.01891	36.3	10.158	0.083	0.08573	45.8	78.7	0.12
58	52059.09	-15	2174360.34	17012236.09	836.32	9.077	6.82954	37	11.359	0.112	0.11537	45.8	81	0.161
59	52059.09	-10	2174365.34	17012236.22	836.32	9.874	7.57568	37.5	12.445	0.14	0.14555	46.1	83.5	0.202
60	52059.09	-5	2174370.34	17012236.34	836.32	10.456	8.13337	37.9	13.247	0.162	0.1698	46.4	86.4	0.235
61	52059.09	0	2174375.34	17012236.47	836.32	10.709	8.37957	38	13.598	0.172	0.18103	46.5	89.5	0.249
62	52059.09	5	2174380.34	17012236.59	836.32	10.575	8.25085	38	13.413	0.167	0.17534	46.5	92.6	0.242
63	52059.09	10	2174385.34	17012236.72	836.32	10.086	7.7809	37.6	12.739	0.148	0.15478	46.2	95.6	0.214
64	52059.09	15	2174390.34	17012236.84	836.32	9.343	7.0801	37.2	11.722	0.122	0.12583	45.9	98.2	0.175
65	52059.09	20	2174395.33	17012236.97	836.32	8.467	6.27776	36.6	10.54	0.093	0.09551	45.7	100.5	0.133
66	52059.09	25	2174400.33	17012237.09	836.32	7.562	5.47598	35.9	9.336	0.066	0.06852	46.1	102.8	0.095
67	52059.09	30	2174405.33	17012237.22	836.32	6.694	4.73549	35.3	8.2	0.043	0.04683	47.6	105.3	0.063
68	52059.09	35	2174410.33	17012237.34	836.32	5.901	4.08265	34.7	7.175	0.025	0.0305	51.1	108.6	0.039
69	52059.09	40	2174415.33	17012237.47	836.32	5.195	3.52226	34.1	6.276	0.011	0.01873	58.7	113.5	0.022
70	52059.09	45	2174420.33	17012237.59	836.32	4.578	3.04809	33.7	5.5	0.005	0.01053	63.9	116	0.011
71	52059.09	50	2174425.32	17012237.72	836.32	4.043	2.64946	33.2	4.834	0.009	0.00501	30	76.2	0.009
72	52059.09	55	2174430.32	17012237.84	836.32	3.582	2.31489	32.9	4.265	0.013	0.0019	8.4	79.8	0.013
73	52059.09	60	2174435.32	17012237.97	836.32	3.185	2.03367	32.6	3.779	0.016	0.00232	8.4	84.3	0.016
74	52059.09	65	2174440.32	17012238.09	836.32	2.843	1.7965	32.3	3.363	0.017	0.00364	11.8	87	0.018
75	52059.09	70	2174445.32	17012238.22	836.32	2.548	1.5956	32.1	3.007	0.018	0.00456	14	88.6	0.019
76	52059.09	75	2174450.32	17012238.34	836.32	2.293	1.42457	31.8	2.7	0.019	0.00512	15.3	89.6	0.019
77	52059.09	80	2174455.32	17012238.47	836.32	2.072	1.27819	31.7	2.435	0.019	0.0054	16.2	90.3	0.019
78	52059.09	85	2174460.31	17012238.59	836.32	1.879	1.15224	31.5	2.204	0.018	0.00551	16.8	90.7	0.019
79	52059.09	90	2174465.31	17012238.71	836.32	1.711	1.04328	31.4	2.004	0.018	0.00549	17.2	91.1	0.019
80	52059.09	95	2174470.31	17012238.84	836.32	1.563	0.94854	31.3	1.828	0.017	0.00539	17.5	91.3	0.018
81	52059.09	100	2174475.31	17012238.96	836.32	1.432	0.86575	31.2	1.673	0.016	0.00524	17.7	91.4	0.017
82	52059.09	105	2174480.31	17012239.09	836.32	1.317	0.79305	31.1	1.537	0.016	0.00505	17.8	91.6	0.016
83	52059.09	110	2174485.31	17012239.21	836.32	1.214	0.72893	31	1.416	0.015	0.00485	17.9	91.6	0.016
84	52059.09	115	2174490.3	17012239.34	836.32	1.123	0.67213	30.9	1.309	0.014	0.00464	18	91.7	0.015
85	52059.09	120	2174495.3	17012239.46	836.32	1.041	0.62161	30.8	1.213	0.014	0.00443	18.1	91.7	0.014
86	52059.09	125	2174500.3	17012239.59	836.32	0.968	0.57649	30.8	1.127	0.013	0.00422	18.1	91.7	0.014
87	52059.09	130	2174505.3	17012239.71	836.32	0.902	0.53606	30.7	1.049	0.012	0.00402	18.2	91.7	0.013
88	52059.09	135	2174510.3	17012239.84	836.32	0.842	0.4997	30.7	0.979	0.012	0.00383	18.2	91.7	0.012
89	52059.09	140	2174515.3	17012239.96	836.32	0.788	0.46689	30.6	0.916	0.011	0.00364	18.2	91.7	0.012
90	52059.09	145	2174520.29	17012240.09	836.32	0.739	0.43719	30.6	0.859	0.011	0.00347	18.2	91.7	0.011
91	52059.09	150	2174525.29	17012240.21	836.32	0.695	0.41023	30.6	0.807	0.01	0.0033	18.3	91.7	0.011
92	52059.09	155	2174530.29	17012240.34	836.32	0.654	0.38569	30.5	0.759	0.01	0.00314	18.3	91.7	0.01
93	52059.09	160	2174535.29	17012240.46	836.32	0.617	0.36328	30.5	0.716	0.009	0.00299	18.3	91.7	0.01
94	52059.09	165	2174540.29	17012240.59	836.32	0.583	0.34278	30.5	0.676	0.009	0.00285	18.3	91.6	0.009
95	52059.09	170	2174545.29	17012240.71	836.32	0.551	0.32398	30.4	0.639	0.008	0.00272	18.3	91.6	0.009
96	52059.09	175	2174550.29	17012240.84	836.32	0.522	0.30669	30.4	0.606	0.008	0.0026	18.3	91.6	0.008
97	52059.09	180	2174555.28	17012240.96	836.32	0.496	0.29077	30.4	0.575	0.007	0.00248	18.3	91.6	0.008
98	52059.09	185	2174560.28	17012241.08	836.32	0.471	0.27606	30.4	0.546	0.007	0.00237	18.3	91.5	0.008
99	52059.09	190	2174565.28	17012241.21	836.32	0.448	0.26246	30.4	0.519	0.007	0.00226	18.3	91.5	0.007
100	52059.09	195	2174570.28	17012241.33	836.32	0.427	0.24985	30.3	0.495	0.007	0.00217	18.3	91.5	0.007
101	52059.09	200	2174575.28	17012241.46	836.32	0.407	0.23814	30.3	0.472	0.006	0.00207	18.3	91.5	0.007
102	52059.09	205	2174580.28	17012241.58	836.32	0.389	0.22725	30.3	0.45	0.006	0.00199	18.3	91.4	0.006
103	52059.09	210	2174585.27	17012241.71	836.32	0.372	0.21711	30.3	0.43	0.006	0.00191	18.3	91.4	0.006
104	52059.09	215	2174590.27	17012241.83	836.32	0.356	0.20765	30.3	0.412	0.006	0.00183	18.3	91.4	0.006
105	52059.09	220	2174595.27	17012241.96	836.32	0.341	0.1988	30.3	0.394	0.005	0.00176	18.3	91.4	0.006
106	52059.09	225	2174600.27	17012242.08	836.32	0.327	0.19052	30.3	0.378	0.005	0.00169	18.3	91.4	0.005
107	52059.09	230	2174605.27	17012242.21	836.32	0.313	0.18277	30.2	0.363	0.005	0.00162	18.3	91.3	0.005
108	52059.09	235	2174610.27	17012242.33	836.32	0.301	0.17549	30.2	0.348	0.005	0.00156	18.3	91.3	0.005
109	52059.09	240	2174615.27	17012242.46	836.32	0.289	0.16865	30.2	0.335	0.005	0.0015	18.3	91.3	0.005

110	52059.09	245	2174620.26	17012242.58	836.32	0.279	0.16221	30.2	0.322	0.004	0.00145	18.3	91.3	0.005
111	52059.09	250	2174625.26	17012242.71	836.32	0.268	0.15615	30.2	0.31	0.004	0.0014	18.3	91.3	0.004
112	52059.09	255	2174630.26	17012242.83	836.32	0.258	0.15043	30.2	0.299	0.004	0.00135	18.3	91.2	0.004
113	52059.09	260	2174635.26	17012242.96	836.32	0.249	0.14504	30.2	0.288	0.004	0.0013	18.3	91.2	0.004
114	52059.09	265	2174640.26	17012243.08	836.32	0.241	0.13994	30.2	0.278	0.004	0.00125	18.3	91.2	0.004
115	52059.09	270	2174645.26	17012243.21	836.32	0.232	0.13512	30.2	0.269	0.004	0.00121	18.3	91.2	0.004
116	52059.09	275	2174650.25	17012243.33	836.32	0.225	0.13055	30.2	0.26	0.004	0.00117	18.3	91.2	0.004
117	52059.09	280	2174655.25	17012243.46	836.32	0.217	0.12622	30.2	0.251	0.003	0.00113	18.3	91.1	0.004
118	52059.09	285	2174660.25	17012243.58	836.32	0.21	0.12211	30.2	0.243	0.003	0.00109	18.3	91.1	0.003
119	52059.09	290	2174665.25	17012243.7	836.32	0.204	0.11821	30.2	0.235	0.003	0.00106	18.2	91.1	0.003
120	52059.09	295	2174670.25	17012243.83	836.32	0.197	0.11451	30.1	0.228	0.003	0.00103	18.2	91.1	0.003
121	52059.09	300	2174675.25	17012243.95	836.32	0.191	0.11098	30.1	0.221	0.003	0.00099	18.2	91.1	0.003

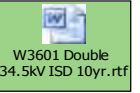
Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	169.65	-300	2150485.41	16931421.68	636.15	0.204	0.12557	31.6	0.24	0.003	0.00102	17.3	89	0.003
2	169.65	-295	2150490.23	16931420.34	636.15	0.21	0.12904	31.6	0.247	0.003	0.00105	17.3	89	0.004
3	169.65	-290	2150495.04	16931419	636.15	0.216	0.13268	31.6	0.254	0.003	0.00108	17.3	89	0.004
4	169.65	-285	2150499.86	16931417.66	636.15	0.222	0.1365	31.5	0.261	0.004	0.00111	17.3	89	0.004
5	169.65	-280	2150504.68	16931416.33	636.15	0.229	0.14051	31.5	0.269	0.004	0.00114	17.3	89	0.004
6	169.65	-275	2150509.49	16931414.99	636.15	0.236	0.14472	31.5	0.277	0.004	0.00117	17.3	89	0.004
7	169.65	-270	2150514.31	16931413.65	636.15	0.243	0.14916	31.5	0.285	0.004	0.00121	17.3	88.9	0.004
8	169.65	-265	2150519.13	16931412.31	636.15	0.251	0.15383	31.5	0.294	0.004	0.00125	17.3	88.9	0.004
9	169.65	-260	2150523.95	16931410.97	636.15	0.259	0.15874	31.5	0.304	0.004	0.00129	17.2	88.9	0.004
10	169.65	-255	2150528.76	16931409.63	636.15	0.267	0.16393	31.5	0.313	0.004	0.00132	17.2	88.9	0.004
11	169.65	-250	2150533.58	16931408.29	636.15	0.276	0.16941	31.5	0.324	0.004	0.00137	17.2	88.9	0.005
12	169.65	-245	2150538.4	16931406.95	636.15	0.286	0.1752	31.5	0.335	0.005	0.00141	17.2	88.9	0.005
13	169.65	-240	2150543.21	16931405.61	636.15	0.296	0.18133	31.5	0.347	0.005	0.00145	17.2	88.9	0.005
14	169.65	-235	2150548.03	16931404.27	636.15	0.306	0.18781	31.5	0.359	0.005	0.0015	17.1	88.9	0.005
15	169.65	-230	2150552.85	16931402.93	636.15	0.317	0.19469	31.5	0.372	0.005	0.00155	17.1	88.8	0.005
16	169.65	-225	2150557.67	16931401.59	636.15	0.329	0.20199	31.5	0.386	0.005	0.0016	17.1	88.8	0.005
17	169.65	-220	2150562.48	16931400.25	636.15	0.342	0.20975	31.5	0.401	0.005	0.00165	17	88.8	0.006
18	169.65	-215	2150567.3	16931398.91	636.15	0.355	0.218	31.6	0.417	0.006	0.00171	17	88.8	0.006
19	169.65	-210	2150572.12	16931397.57	636.15	0.369	0.2268	31.6	0.433	0.006	0.00176	17	88.8	0.006
20	169.65	-205	2150576.94	16931396.23	636.15	0.384	0.23618	31.6	0.451	0.006	0.00182	16.9	88.8	0.006
21	169.65	-200	2150581.75	16931394.89	636.15	0.401	0.24619	31.6	0.47	0.006	0.00188	16.9	88.8	0.006
22	169.65	-195	2150586.57	16931393.55	636.15	0.418	0.25691	31.6	0.49	0.006	0.00194	16.8	88.8	0.007
23	169.65	-190	2150591.39	16931392.21	636.15	0.436	0.26839	31.6	0.512	0.007	0.00201	16.8	88.8	0.007
24	169.65	-185	2150596.2	16931390.88	636.15	0.456	0.2807	31.6	0.535	0.007	0.00207	16.7	88.8	0.007
25	169.65	-180	2150601.02	16931389.54	636.15	0.477	0.29394	31.6	0.56	0.007	0.00214	16.6	88.8	0.007
26	169.65	-175	2150605.84	16931388.2	636.15	0.5	0.30817	31.7	0.587	0.007	0.00221	16.6	88.8	0.008
27	169.65	-170	2150610.66	16931386.86	636.15	0.524	0.32352	31.7	0.616	0.008	0.00227	16.5	88.8	0.008
28	169.65	-165	2150615.47	16931385.52	636.15	0.551	0.3401	31.7	0.647	0.008	0.00234	16.4	88.8	0.008
29	169.65	-160	2150620.29	16931384.18	636.15	0.579	0.35802	31.7	0.681	0.008	0.00241	16.2	88.8	0.009
30	169.65	-155	2150625.11	16931382.84	636.15	0.61	0.37745	31.8	0.717	0.009	0.00247	16.1	88.8	0.009
31	169.65	-150	2150629.93	16931381.5	636.15	0.643	0.39854	31.8	0.756	0.009	0.00253	15.9	88.9	0.009
32	169.65	-145	2150634.74	16931380.16	636.15	0.679	0.42149	31.8	0.799	0.009	0.00258	15.8	88.9	0.01
33	169.65	-140	2150639.56	16931378.82	636.15	0.718	0.44651	31.9	0.846	0.009	0.00263	15.5	89	0.01
34	169.65	-135	2150644.38	16931377.48	636.15	0.761	0.47384	31.9	0.896	0.01	0.00266	15.3	89	0.01
35	169.65	-130	2150649.19	16931376.14	636.15	0.807	0.50377	32	0.951	0.01	0.00268	15	89.1	0.01
36	169.65	-125	2150654.01	16931374.8	636.15	0.858	0.5366	32	1.012	0.01	0.00268	14.6	89.2	0.011
37	169.65	-120	2150658.83	16931373.46	636.15	0.913	0.57271	32.1	1.078	0.011	0.00266	14.1	89.4	0.011
38	169.65	-115	2150663.65	16931372.12	636.15	0.974	0.6125	32.2	1.15	0.011	0.00259	13.6	89.5	0.011
39	169.65	-110	2150668.46	16931370.78	636.15	1.04	0.65648	32.3	1.23	0.011	0.00249	12.9	89.8	0.011
40	169.65	-105	2150673.28	16931369.44	636.15	1.113	0.70518	32.3	1.318	0.011	0.00232	12	90.1	0.011
41	169.65	-100	2150678.1	16931368.1	636.15	1.194	0.75924	32.4	1.415	0.011	0.00208	10.8	90.4	0.011
42	169.65	-95	2150682.92	16931366.77	636.15	1.283	0.81938	32.6	1.523	0.011	0.00175	9.2	90.9	0.011
43	169.65	-90	2150687.73	16931365.43	636.15	1.382	0.88644	32.7	1.642	0.01	0.0013	7.1	91.6	0.011
44	169.65	-85	2150692.55	16931364.09	636.15	1.49	0.96137	32.8	1.774	0.01	0.00077	4.4	92.5	0.01
45	169.65	-80	2150697.37	16931362.75	636.15	1.611	1.04524	33	1.92	0.009	0.00063	4	93.7	0.009
46	169.65	-75	2150702.18	16931361.41	636.15	1.744	1.13925	33.2	2.083	0.008	0.00155	11	95	0.008
47	169.65	-70	2150707	16931360.07	636.15	1.892	1.24473	33.3	2.265	0.006	0.00299	25	95.4	0.007
48	169.65	-65	2150711.82	16931358.73	636.15	2.055	1.3631	33.6	2.466	0.004	0.0049	48.2	90	0.006
49	169.65	-60	2150716.64	16931357.39	636.15	2.235	1.49586	33.8	2.69	0.002	0.00738	72.5	78.8	0.007
50	169.65	-55	2150721.45	16931356.05	636.15	2.434	1.64446	34	2.937	0.003	0.01057	71.8	75.5	0.011
51	169.65	-50	2150726.27	16931354.71	636.15	2.651	1.81015	34.3	3.21	0.008	0.01462	62.2	76.5	0.016
52	169.65	-45	2150731.09	16931353.37	636.15	2.887	1.99379	34.6	3.509	0.013	0.01971	55.8	78	0.024



53	169.65	-40	2150735.9	16931352.03	636.15	3.141	2.19543	35	3.832	0.02	0.02599	52	79.4	0.033
54	169.65	-35	2150740.72	16931350.69	636.15	3.41	2.41381	35.3	4.178	0.029	0.0336	49.6	80.5	0.044
55	169.65	-30	2150745.54	16931349.35	636.15	3.69	2.64574	35.6	4.54	0.038	0.04256	48.1	81.6	0.057
56	169.65	-25	2150750.36	16931348.01	636.15	3.973	2.88535	36	4.91	0.049	0.05275	47.3	82.7	0.072
57	169.65	-20	2150755.17	16931346.67	636.15	4.248	3.12342	36.3	5.273	0.06	0.06378	46.9	83.8	0.087
58	169.65	-15	2150759.99	16931345.33	636.15	4.503	3.34718	36.6	5.61	0.071	0.07495	46.7	84.9	0.103
59	169.65	-10	2150764.81	16931343.99	636.15	4.719	3.54089	36.9	5.9	0.08	0.08523	46.7	86.2	0.117
60	169.65	-5	2150769.63	16931342.65	636.15	4.881	3.68768	37.1	6.118	0.088	0.09342	46.7	87.6	0.128
61	169.65	0	2150774.44	16931341.32	636.15	4.975	3.77258	37.2	6.243	0.092	0.09835	46.8	89	0.135
62	169.65	5	2150779.26	16931339.98	636.15	4.989	3.78601	37.2	6.263	0.093	0.09926	46.8	90.4	0.136
63	169.65	10	2150784.08	16931338.64	636.15	4.924	3.72633	37.1	6.175	0.09	0.09599	46.8	91.9	0.132
64	169.65	15	2150788.89	16931337.3	636.15	4.786	3.60036	37	5.989	0.084	0.08909	46.8	93.2	0.122
65	169.65	20	2150793.71	16931335.96	636.15	4.587	3.42144	36.7	5.723	0.075	0.07959	46.8	94.5	0.109
66	169.65	25	2150798.53	16931334.62	636.15	4.344	3.20617	36.4	5.399	0.064	0.06871	47	95.7	0.094
67	169.65	30	2150803.35	16931333.28	636.15	4.074	2.97101	36.1	5.042	0.053	0.05758	47.4	96.8	0.078
68	169.65	35	2150808.16	16931331.94	636.15	3.792	2.73003	35.8	4.672	0.042	0.04702	48.1	97.9	0.063
69	169.65	40	2150812.98	16931330.6	636.15	3.509	2.49379	35.4	4.305	0.032	0.03755	49.3	98.9	0.05
70	169.65	45	2150817.8	16931329.26	636.15	3.234	2.26937	35.1	3.951	0.024	0.02939	51.3	100	0.038
71	169.65	50	2150822.62	16931327.92	636.15	2.974	2.06089	34.7	3.618	0.016	0.02257	54.6	101.2	0.028
72	169.65	55	2150827.43	16931326.58	636.15	2.73	1.87022	34.4	3.31	0.01	0.01701	59.9	102.6	0.02
73	169.65	60	2150832.25	16931325.24	636.15	2.506	1.69771	34.1	3.027	0.005	0.01254	68.2	103.8	0.013
74	169.65	65	2150837.07	16931323.9	636.15	2.3	1.54276	33.9	2.77	0.002	0.00899	76.5	103	0.009
75	169.65	70	2150841.88	16931322.56	636.15	2.113	1.40422	33.6	2.537	0.003	0.00622	61.3	95.5	0.007
76	169.65	75	2150846.7	16931321.22	636.15	1.943	1.28066	33.4	2.327	0.006	0.00406	36.3	86.7	0.007
77	169.65	80	2150851.52	16931319.88	636.15	1.79	1.17059	33.2	2.139	0.007	0.0024	18.3	85	0.008
78	169.65	85	2150856.34	16931318.54	636.15	1.651	1.07254	33	1.969	0.009	0.00118	7.8	86	0.009
79	169.65	90	2150861.15	16931317.2	636.15	1.526	0.98514	32.8	1.817	0.01	0.00051	3.1	87.1	0.01
80	169.65	95	2150865.97	16931315.87	636.15	1.413	0.90712	32.7	1.679	0.01	0.00084	4.7	88.1	0.01
81	169.65	100	2150870.79	16931314.53	636.15	1.311	0.83737	32.6	1.556	0.011	0.00133	7.2	88.8	0.011
82	169.65	105	2150875.6	16931313.19	636.15	1.219	0.77488	32.4	1.444	0.011	0.00172	9.1	89.4	0.011
83	169.65	110	2150880.42	16931311.85	636.15	1.135	0.71878	32.3	1.344	0.011	0.00201	10.5	89.8	0.011
84	169.65	115	2150885.24	16931310.51	636.15	1.06	0.66831	32.2	1.253	0.011	0.00221	11.6	90.1	0.011
85	169.65	120	2150890.06	16931309.17	636.15	0.991	0.62278	32.2	1.17	0.011	0.00236	12.4	90.4	0.011
86	169.65	125	2150894.87	16931307.83	636.15	0.928	0.58163	32.1	1.095	0.01	0.00245	13.1	90.6	0.011
87	169.65	130	2150899.69	16931306.49	636.15	0.871	0.54434	32	1.027	0.01	0.0025	13.7	90.7	0.011
88	169.65	135	2150904.51	16931305.15	636.15	0.819	0.51047	31.9	0.965	0.01	0.00252	14.1	90.8	0.01
89	169.65	140	2150909.33	16931303.81	636.15	0.771	0.47964	31.9	0.908	0.01	0.00252	14.5	90.9	0.01
90	169.65	145	2150914.14	16931302.47	636.15	0.727	0.45151	31.8	0.856	0.009	0.00249	14.8	91	0.01
91	169.65	150	2150918.96	16931301.13	636.15	0.687	0.42579	31.8	0.808	0.009	0.00246	15	91.1	0.009
92	169.65	155	2150923.78	16931299.79	636.15	0.65	0.40222	31.7	0.764	0.009	0.00242	15.3	91.1	0.009
93	169.65	160	2150928.59	16931298.45	636.15	0.616	0.38058	31.7	0.724	0.009	0.00237	15.4	91.2	0.009
94	169.65	165	2150933.41	16931297.11	636.15	0.585	0.36067	31.7	0.687	0.008	0.00231	15.6	91.2	0.009
95	169.65	170	2150938.23	16931295.77	636.15	0.555	0.34231	31.6	0.652	0.008	0.00225	15.7	91.2	0.008
96	169.65	175	2150943.05	16931294.43	636.15	0.529	0.32536	31.6	0.621	0.008	0.00219	15.9	91.2	0.008
97	169.65	180	2150947.86	16931293.09	636.15	0.504	0.30968	31.6	0.591	0.007	0.00213	16	91.2	0.008
98	169.65	185	2150952.68	16931291.76	636.15	0.48	0.29514	31.6	0.564	0.007	0.00206	16.1	91.2	0.007
99	169.65	190	2150957.5	16931290.42	636.15	0.459	0.28164	31.5	0.538	0.007	0.002	16.2	91.2	0.007
100	169.65	195	2150962.32	16931289.08	636.15	0.439	0.2691	31.5	0.515	0.007	0.00194	16.2	91.2	0.007
101	169.65	200	2150967.13	16931287.74	636.15	0.42	0.25741	31.5	0.492	0.006	0.00188	16.3	91.2	0.007
102	169.65	205	2150971.95	16931286.4	636.15	0.402	0.2465	31.5	0.472	0.006	0.00182	16.4	91.2	0.006
103	169.65	210	2150976.77	16931285.06	636.15	0.386	0.23632	31.5	0.452	0.006	0.00176	16.4	91.2	0.006
104	169.65	215	2150981.58	16931283.72	636.15	0.37	0.22679	31.5	0.434	0.006	0.00171	16.5	91.2	0.006
105	169.65	220	2150986.4	16931282.38	636.15	0.356	0.21787	31.5	0.417	0.006	0.00165	16.5	91.2	0.006

106	169.65	225	2150991.22	16931281.04	636.15	0.342	0.2095	31.5	0.401	0.005	0.0016	16.5	91.2	0.006
107	169.65	230	2150996.04	16931279.7	636.15	0.33	0.20164	31.5	0.386	0.005	0.00155	16.6	91.2	0.005
108	169.65	235	2151000.85	16931278.36	636.15	0.318	0.19424	31.4	0.372	0.005	0.0015	16.6	91.2	0.005
109	169.65	240	2151005.67	16931277.02	636.15	0.306	0.18728	31.4	0.359	0.005	0.00145	16.6	91.1	0.005
110	169.65	245	2151010.49	16931275.68	636.15	0.296	0.18072	31.4	0.346	0.005	0.00141	16.7	91.1	0.005
111	169.65	250	2151015.3	16931274.34	636.15	0.286	0.17453	31.4	0.335	0.005	0.00136	16.7	91.1	0.005
112	169.65	255	2151020.12	16931273	636.15	0.276	0.16869	31.4	0.323	0.004	0.00132	16.7	91.1	0.005
113	169.65	260	2151024.94	16931271.66	636.15	0.267	0.16316	31.4	0.313	0.004	0.00128	16.7	91.1	0.004
114	169.65	265	2151029.76	16931270.32	636.15	0.258	0.15793	31.4	0.303	0.004	0.00124	16.8	91.1	0.004
115	169.65	270	2151034.57	16931268.98	636.15	0.25	0.15297	31.4	0.293	0.004	0.0012	16.8	91.1	0.004
116	169.65	275	2151039.39	16931267.64	636.15	0.243	0.14826	31.4	0.284	0.004	0.00117	16.8	91.1	0.004
117	169.65	280	2151044.21	16931266.31	636.15	0.235	0.1438	31.4	0.276	0.004	0.00113	16.8	91.1	0.004
118	169.65	285	2151049.03	16931264.97	636.15	0.228	0.13956	31.4	0.268	0.004	0.0011	16.8	91	0.004
119	169.65	290	2151053.84	16931263.63	636.15	0.222	0.13553	31.4	0.26	0.004	0.00107	16.8	91	0.004
120	169.65	295	2151058.66	16931262.29	636.15	0.215	0.13169	31.4	0.252	0.003	0.00104	16.9	91	0.004
121	169.65	300	2151063.48	16931260.95	636.15	0.209	0.12803	31.4	0.245	0.003	0.00101	16.9	91	0.003

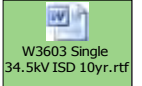
Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	37864.36	-300	2158063.64	16961510.89	931.31	0.228	0.13223	30.1	0.264	0.004	0.00105	13.8	88.9	0.004
2	37864.36	-295	2158068.64	16961510.9	931.31	0.236	0.13671	30.1	0.273	0.004	0.00109	13.8	88.9	0.005
3	37864.36	-290	2158073.64	16961510.92	931.31	0.244	0.14141	30.1	0.282	0.005	0.00112	13.8	88.9	0.005
4	37864.36	-285	2158078.64	16961510.93	931.31	0.252	0.14637	30.1	0.292	0.005	0.00116	13.8	88.9	0.005
5	37864.36	-280	2158083.64	16961510.94	931.31	0.261	0.15158	30.1	0.302	0.005	0.0012	13.8	88.8	0.005
6	37864.36	-275	2158088.64	16961510.96	931.31	0.271	0.15708	30.1	0.313	0.005	0.00124	13.7	88.8	0.005
7	37864.36	-270	2158093.64	16961510.97	931.31	0.281	0.16289	30.1	0.325	0.005	0.00128	13.7	88.8	0.005
8	37864.36	-265	2158098.64	16961510.98	931.31	0.291	0.16902	30.1	0.337	0.005	0.00133	13.7	88.8	0.006
9	37864.36	-260	2158103.64	16961510.99	931.31	0.302	0.1755	30.1	0.35	0.006	0.00137	13.7	88.8	0.006
10	37864.36	-255	2158108.64	16961511.01	931.31	0.314	0.18236	30.1	0.363	0.006	0.00142	13.7	88.7	0.006
11	37864.36	-250	2158113.64	16961511.02	931.31	0.327	0.18963	30.1	0.378	0.006	0.00148	13.7	88.7	0.006
12	37864.36	-245	2158118.64	16961511.03	931.31	0.34	0.19734	30.1	0.393	0.006	0.00153	13.7	88.7	0.006
13	37864.36	-240	2158123.64	16961511.05	931.31	0.354	0.20552	30.1	0.409	0.007	0.00159	13.7	88.7	0.007
14	37864.36	-235	2158128.64	16961511.06	931.31	0.369	0.21423	30.1	0.427	0.007	0.00165	13.7	88.7	0.007
15	37864.36	-230	2158133.64	16961511.07	931.31	0.385	0.2235	30.2	0.445	0.007	0.00171	13.7	88.6	0.007
16	37864.36	-225	2158138.64	16961511.08	931.31	0.402	0.23337	30.2	0.464	0.007	0.00178	13.6	88.6	0.008
17	37864.36	-220	2158143.64	16961511.1	931.31	0.42	0.24392	30.2	0.485	0.008	0.00186	13.6	88.6	0.008
18	37864.36	-215	2158148.64	16961511.11	931.31	0.439	0.25518	30.2	0.508	0.008	0.00193	13.6	88.6	0.008
19	37864.36	-210	2158153.64	16961511.12	931.31	0.459	0.26725	30.2	0.532	0.008	0.00201	13.6	88.5	0.009
20	37864.36	-205	2158158.64	16961511.14	931.31	0.482	0.28018	30.2	0.557	0.009	0.0021	13.6	88.5	0.009
21	37864.36	-200	2158163.64	16961511.15	931.31	0.505	0.29407	30.2	0.585	0.009	0.00219	13.6	88.5	0.009
22	37864.36	-195	2158168.64	16961511.16	931.31	0.531	0.30901	30.2	0.614	0.01	0.00229	13.5	88.4	0.01
23	37864.36	-190	2158173.64	16961511.17	931.31	0.558	0.3251	30.2	0.646	0.01	0.00239	13.5	88.4	0.01
24	37864.36	-185	2158178.64	16961511.19	931.31	0.588	0.34248	30.2	0.68	0.01	0.0025	13.5	88.4	0.011
25	37864.36	-180	2158183.64	16961511.2	931.31	0.62	0.36128	30.2	0.717	0.011	0.00262	13.5	88.4	0.011
26	37864.36	-175	2158188.64	16961511.21	931.31	0.654	0.38165	30.3	0.757	0.011	0.00274	13.4	88.3	0.012
27	37864.36	-170	2158193.64	16961511.23	931.31	0.692	0.40377	30.3	0.801	0.012	0.00287	13.4	88.3	0.012
28	37864.36	-165	2158198.64	16961511.24	931.31	0.732	0.42786	30.3	0.848	0.013	0.00301	13.3	88.3	0.013
29	37864.36	-160	2158203.64	16961511.25	931.31	0.777	0.45414	30.3	0.9	0.013	0.00315	13.3	88.2	0.014
30	37864.36	-155	2158208.64	16961511.26	931.31	0.825	0.48289	30.3	0.956	0.014	0.00331	13.2	88.2	0.014
31	37864.36	-150	2158213.64	16961511.28	931.31	0.878	0.51442	30.4	1.018	0.015	0.00348	13.2	88.2	0.015
32	37864.36	-145	2158218.64	16961511.29	931.31	0.937	0.54909	30.4	1.086	0.016	0.00365	13.1	88.1	0.016
33	37864.36	-140	2158223.64	16961511.3	931.31	1.001	0.58734	30.4	1.161	0.017	0.00383	13	88.1	0.017
34	37864.36	-135	2158228.64	16961511.32	931.31	1.072	0.62966	30.4	1.243	0.017	0.00403	13	88.1	0.018
35	37864.36	-130	2158233.64	16961511.33	931.31	1.15	0.67664	30.5	1.335	0.019	0.00423	12.9	88.1	0.019
36	37864.36	-125	2158238.64	16961511.34	931.31	1.238	0.72898	30.5	1.436	0.02	0.00444	12.7	88	0.02
37	37864.36	-120	2158243.64	16961511.35	931.31	1.335	0.78749	30.5	1.55	0.021	0.00465	12.6	88	0.021
38	37864.36	-115	2158248.64	16961511.37	931.31	1.444	0.85318	30.6	1.677	0.022	0.00486	12.4	88	0.023
39	37864.36	-110	2158253.64	16961511.38	931.31	1.566	0.92723	30.6	1.82	0.023	0.00507	12.2	88	0.024
40	37864.36	-105	2158258.64	16961511.39	931.31	1.704	1.01107	30.7	1.981	0.025	0.00526	12	88.1	0.025
41	37864.36	-100	2158263.64	16961511.41	931.31	1.86	1.10646	30.8	2.164	0.026	0.00543	11.7	88.1	0.027
42	37864.36	-95	2158268.64	16961511.42	931.31	2.037	1.21552	30.8	2.372	0.028	0.00555	11.3	88.2	0.028
43	37864.36	-90	2158273.64	16961511.43	931.31	2.24	1.34089	30.9	2.611	0.029	0.0056	10.9	88.3	0.03
44	37864.36	-85	2158278.64	16961511.44	931.31	2.473	1.48583	31	2.885	0.031	0.00554	10.2	88.5	0.031
45	37864.36	-80	2158283.64	16961511.46	931.31	2.741	1.65438	31.1	3.202	0.032	0.00532	9.4	88.8	0.032
46	37864.36	-75	2158288.64	16961511.47	931.31	3.053	1.85163	31.2	3.571	0.033	0.00485	8.3	89.2	0.033
47	37864.36	-70	2158293.64	16961511.48	931.31	3.416	2.08395	31.4	4.001	0.034	0.00402	6.8	89.8	0.034
48	37864.36	-65	2158298.64	16961511.5	931.31	3.841	2.35938	31.6	4.508	0.034	0.00275	4.6	90.6	0.034
49	37864.36	-60	2158303.64	16961511.51	931.31	4.341	2.68805	31.8	5.106	0.033	0.00177	3.1	91.9	0.033
50	37864.36	-55	2158308.64	16961511.52	931.31	4.931	3.08266	32	5.816	0.03	0.00433	8.1	93.8	0.03
51	37864.36	-50	2158313.64	16961511.54	931.31	5.63	3.5589	32.3	6.661	0.025	0.0098	21.1	95.6	0.027
52	37864.36	-45	2158318.64	16961511.55	931.31	6.458	4.13564	32.6	7.668	0.018	0.01833	46.1	90.2	0.024
53	37864.36	-40	2158323.64	16961511.56	931.31	7.435	4.83434	33	8.868	0.011	0.0312	71.3	72.3	0.031



54	37864.36	-35	2158328.64	16961511.57	931.31	8.578	5.67658	33.5	10.286	0.023	0.05023	65	70.3	0.055
55	37864.36	-30	2158333.64	16961511.59	931.31	9.895	6.67799	34	11.937	0.052	0.07763	56.3	72.8	0.093
56	37864.36	-25	2158338.64	16961511.6	931.31	11.367	7.83591	34.6	13.806	0.091	0.11551	51.6	75.4	0.147
57	37864.36	-20	2158343.64	16961511.61	931.31	12.933	9.10928	35.2	15.819	0.141	0.16455	49.4	78	0.217
58	37864.36	-15	2158348.64	16961511.63	931.31	14.472	10.39606	35.7	17.819	0.197	0.22173	48.4	80.6	0.296
59	37864.36	-10	2158353.64	16961511.64	931.31	15.797	11.52813	36.1	19.556	0.25	0.27839	48.1	83.5	0.374
60	37864.36	-5	2158358.64	16961511.65	931.31	16.7	12.30929	36.4	20.747	0.289	0.32108	48	86.7	0.432
61	37864.36	0	2158363.64	16961511.66	931.31	17.021	12.58759	36.5	21.17	0.303	0.33705	48	90	0.453
62	37864.36	5	2158368.64	16961511.68	931.31	16.699	12.30821	36.4	20.745	0.289	0.32106	48	93.3	0.432
63	37864.36	10	2158373.64	16961511.69	931.31	15.795	11.52641	36.1	19.553	0.25	0.27837	48.1	96.5	0.374
64	37864.36	15	2158378.64	16961511.7	931.31	14.47	10.39424	35.7	17.816	0.197	0.22172	48.4	99.4	0.296
65	37864.36	20	2158383.64	16961511.72	931.31	12.932	9.1077	35.2	15.817	0.141	0.16455	49.4	102	0.217
66	37864.36	25	2158388.64	16961511.73	931.31	11.365	7.83469	34.6	13.804	0.091	0.11552	51.6	104.6	0.147
67	37864.36	30	2158393.64	16961511.74	931.31	9.894	6.6771	34	11.936	0.052	0.07764	56.3	107.2	0.093
68	37864.36	35	2158398.64	16961511.75	931.31	8.577	5.67594	33.5	10.285	0.023	0.05025	65	109.7	0.055
69	37864.36	40	2158403.64	16961511.77	931.31	7.434	4.83389	33	8.867	0.011	0.03122	71.3	107.7	0.031
70	37864.36	45	2158408.64	16961511.78	931.31	6.457	4.13533	32.6	7.668	0.018	0.01835	46.1	89.8	0.024
71	37864.36	50	2158413.64	16961511.79	931.31	5.63	3.55867	32.3	6.66	0.025	0.00981	21.2	84.4	0.027
72	37864.36	55	2158418.64	16961511.81	931.31	4.931	3.0825	32	5.815	0.03	0.00434	8.2	86.2	0.03
73	37864.36	60	2158423.64	16961511.82	931.31	4.341	2.68793	31.8	5.106	0.033	0.00177	3.1	88.1	0.033
74	37864.36	65	2158428.64	16961511.83	931.31	3.841	2.35929	31.6	4.508	0.034	0.00274	4.6	89.4	0.034
75	37864.36	70	2158433.64	16961511.84	931.31	3.416	2.08388	31.4	4.001	0.034	0.00401	6.8	90.2	0.034
76	37864.36	75	2158438.64	16961511.86	931.31	3.053	1.85158	31.2	3.57	0.033	0.00484	8.3	90.8	0.033
77	37864.36	80	2158443.64	16961511.87	931.31	2.741	1.65435	31.1	3.202	0.032	0.00531	9.4	91.2	0.032
78	37864.36	85	2158448.64	16961511.88	931.31	2.473	1.4858	31	2.885	0.031	0.00554	10.2	91.5	0.031
79	37864.36	90	2158453.64	16961511.9	931.31	2.24	1.34087	30.9	2.611	0.029	0.0056	10.9	91.7	0.03
80	37864.36	95	2158458.64	16961511.91	931.31	2.037	1.2155	30.8	2.372	0.028	0.00555	11.3	91.8	0.028
81	37864.36	100	2158463.64	16961511.92	931.31	1.86	1.10644	30.8	2.164	0.026	0.00542	11.7	91.9	0.027
82	37864.36	105	2158468.64	16961511.93	931.31	1.704	1.01106	30.7	1.981	0.025	0.00526	12	91.9	0.025
83	37864.36	110	2158473.64	16961511.95	931.31	1.566	0.92722	30.6	1.82	0.023	0.00506	12.2	92	0.024
84	37864.36	115	2158478.64	16961511.96	931.31	1.444	0.85317	30.6	1.677	0.022	0.00486	12.4	92	0.023
85	37864.36	120	2158483.64	16961511.97	931.31	1.335	0.78749	30.5	1.55	0.021	0.00465	12.6	92	0.021
86	37864.36	125	2158488.64	16961511.99	931.31	1.238	0.72897	30.5	1.436	0.02	0.00443	12.7	92	0.02
87	37864.36	130	2158493.64	16961512	931.31	1.15	0.67664	30.5	1.335	0.019	0.00423	12.9	91.9	0.019
88	37864.36	135	2158498.64	16961512.01	931.31	1.072	0.62966	30.4	1.243	0.017	0.00403	13	91.9	0.018
89	37864.36	140	2158503.64	16961512.02	931.31	1.001	0.58734	30.4	1.161	0.017	0.00383	13	91.9	0.017
90	37864.36	145	2158508.64	16961512.04	931.31	0.937	0.54909	30.4	1.086	0.016	0.00365	13.1	91.9	0.016
91	37864.36	150	2158513.64	16961512.05	931.31	0.878	0.51441	30.4	1.018	0.015	0.00348	13.2	91.8	0.015
92	37864.36	155	2158518.64	16961512.06	931.31	0.825	0.48289	30.3	0.956	0.014	0.00331	13.2	91.8	0.014
93	37864.36	160	2158523.64	16961512.08	931.31	0.777	0.45414	30.3	0.9	0.013	0.00315	13.3	91.8	0.014
94	37864.36	165	2158528.64	16961512.09	931.31	0.732	0.42786	30.3	0.848	0.013	0.00301	13.3	91.7	0.013
95	37864.36	170	2158533.64	16961512.1	931.31	0.692	0.40377	30.3	0.801	0.012	0.00287	13.4	91.7	0.012
96	37864.36	175	2158538.64	16961512.11	931.31	0.654	0.38165	30.3	0.757	0.011	0.00274	13.4	91.7	0.012
97	37864.36	180	2158543.64	16961512.13	931.31	0.62	0.36128	30.2	0.717	0.011	0.00261	13.5	91.6	0.011
98	37864.36	185	2158548.64	16961512.14	931.31	0.588	0.34248	30.2	0.68	0.01	0.0025	13.5	91.6	0.011
99	37864.36	190	2158553.64	16961512.15	931.31	0.558	0.3251	30.2	0.646	0.01	0.00239	13.5	91.6	0.01
100	37864.36	195	2158558.64	16961512.17	931.31	0.531	0.30901	30.2	0.614	0.01	0.00229	13.5	91.6	0.01
101	37864.36	200	2158563.64	16961512.18	931.31	0.505	0.29407	30.2	0.585	0.009	0.00219	13.6	91.5	0.009
102	37864.36	205	2158568.64	16961512.19	931.31	0.482	0.28018	30.2	0.557	0.009	0.0021	13.6	91.5	0.009
103	37864.36	210	2158573.64	16961512.2	931.31	0.459	0.26725	30.2	0.532	0.008	0.00201	13.6	91.5	0.009
104	37864.36	215	2158578.64	16961512.22	931.31	0.439	0.25518	30.2	0.508	0.008	0.00193	13.6	91.4	0.008
105	37864.36	220	2158583.64	16961512.23	931.31	0.42	0.24392	30.2	0.485	0.008	0.00186	13.6	91.4	0.008
106	37864.36	225	2158588.64	16961512.24	931.31	0.402	0.23337	30.2	0.464	0.007	0.00178	13.6	91.4	0.008
107	37864.36	230	2158593.64	16961512.26	931.31	0.385	0.2235	30.2	0.445	0.007	0.00171	13.7	91.4	0.007

108	37864.36	235	2158598.64	16961512.27	931.31	0.369	0.21423	30.1	0.427	0.007	0.00165	13.7	91.3	0.007
109	37864.36	240	2158603.64	16961512.28	931.31	0.354	0.20552	30.1	0.409	0.007	0.00159	13.7	91.3	0.007
110	37864.36	245	2158608.64	16961512.29	931.31	0.34	0.19734	30.1	0.393	0.006	0.00153	13.7	91.3	0.006
111	37864.36	250	2158613.64	16961512.31	931.31	0.327	0.18963	30.1	0.378	0.006	0.00148	13.7	91.3	0.006
112	37864.36	255	2158618.64	16961512.32	931.31	0.314	0.18236	30.1	0.363	0.006	0.00142	13.7	91.3	0.006
113	37864.36	260	2158623.64	16961512.33	931.31	0.302	0.1755	30.1	0.35	0.006	0.00137	13.7	91.2	0.006
114	37864.36	265	2158628.64	16961512.35	931.31	0.291	0.16902	30.1	0.337	0.005	0.00133	13.7	91.2	0.006
115	37864.36	270	2158633.64	16961512.36	931.31	0.281	0.16289	30.1	0.325	0.005	0.00128	13.7	91.2	0.005
116	37864.36	275	2158638.64	16961512.37	931.31	0.271	0.15708	30.1	0.313	0.005	0.00124	13.7	91.2	0.005
117	37864.36	280	2158643.64	16961512.38	931.31	0.261	0.15158	30.1	0.302	0.005	0.0012	13.8	91.2	0.005
118	37864.36	285	2158648.64	16961512.4	931.31	0.252	0.14637	30.1	0.292	0.005	0.00116	13.8	91.1	0.005
119	37864.36	290	2158653.64	16961512.41	931.31	0.244	0.14141	30.1	0.282	0.005	0.00112	13.8	91.1	0.005
120	37864.36	295	2158658.64	16961512.42	931.31	0.236	0.13671	30.1	0.273	0.004	0.00109	13.8	91.1	0.005
121	37864.36	300	2158663.64	16961512.44	931.31	0.228	0.13223	30.1	0.264	0.004	0.00105	13.8	91.1	0.004

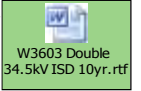
Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	50304.52	-300	2174877.09	17012818.16	884.9	0.167	0.09332	29.2	0.192	0.003	0.00084	17.4	88.9	0.003
2	50304.52	-295	2174880.12	17012814.18	884.9	0.173	0.09637	29.2	0.198	0.003	0.00087	17.4	88.9	0.003
3	50304.52	-290	2174883.16	17012810.2	884.9	0.178	0.09957	29.2	0.204	0.003	0.0009	17.3	88.9	0.003
4	50304.52	-285	2174886.19	17012806.23	884.9	0.184	0.10293	29.2	0.211	0.003	0.00093	17.3	88.9	0.003
5	50304.52	-280	2174889.22	17012802.25	884.9	0.19	0.10648	29.2	0.218	0.003	0.00096	17.3	88.8	0.003
6	50304.52	-275	2174892.25	17012798.27	884.9	0.197	0.11021	29.2	0.226	0.003	0.00099	17.3	88.8	0.003
7	50304.52	-270	2174895.28	17012794.3	884.9	0.204	0.11415	29.2	0.234	0.003	0.00103	17.3	88.8	0.003
8	50304.52	-265	2174898.31	17012790.32	884.9	0.211	0.11831	29.3	0.242	0.003	0.00106	17.3	88.8	0.004
9	50304.52	-260	2174901.34	17012786.34	884.9	0.219	0.1227	29.3	0.251	0.004	0.0011	17.3	88.8	0.004
10	50304.52	-255	2174904.37	17012782.37	884.9	0.227	0.12735	29.3	0.26	0.004	0.00114	17.3	88.8	0.004
11	50304.52	-250	2174907.4	17012778.39	884.9	0.236	0.13227	29.3	0.27	0.004	0.00118	17.3	88.7	0.004
12	50304.52	-245	2174910.43	17012774.41	884.9	0.245	0.13749	29.3	0.281	0.004	0.00123	17.3	88.7	0.004
13	50304.52	-240	2174913.47	17012770.44	884.9	0.255	0.14302	29.3	0.292	0.004	0.00127	17.3	88.7	0.004
14	50304.52	-235	2174916.5	17012766.46	884.9	0.265	0.14891	29.3	0.304	0.004	0.00132	17.3	88.7	0.004
15	50304.52	-230	2174919.53	17012762.48	884.9	0.276	0.15517	29.4	0.317	0.004	0.00138	17.3	88.6	0.005
16	50304.52	-225	2174922.56	17012758.51	884.9	0.288	0.16183	29.4	0.33	0.005	0.00143	17.3	88.6	0.005
17	50304.52	-220	2174925.59	17012754.53	884.9	0.3	0.16895	29.4	0.344	0.005	0.00149	17.3	88.6	0.005
18	50304.52	-215	2174928.62	17012750.55	884.9	0.313	0.17654	29.4	0.36	0.005	0.00155	17.3	88.6	0.005
19	50304.52	-210	2174931.65	17012746.58	884.9	0.327	0.18467	29.4	0.376	0.005	0.00162	17.3	88.5	0.005
20	50304.52	-205	2174934.68	17012742.6	884.9	0.343	0.19338	29.4	0.393	0.005	0.00169	17.3	88.5	0.006
21	50304.52	-200	2174937.71	17012738.62	884.9	0.359	0.20272	29.5	0.412	0.006	0.00176	17.3	88.5	0.006
22	50304.52	-195	2174940.74	17012734.65	884.9	0.376	0.21276	29.5	0.432	0.006	0.00184	17.3	88.5	0.006
23	50304.52	-190	2174943.77	17012730.67	884.9	0.395	0.22357	29.5	0.454	0.006	0.00193	17.3	88.4	0.006
24	50304.52	-185	2174946.81	17012726.69	884.9	0.416	0.23522	29.5	0.477	0.006	0.00202	17.3	88.4	0.007
25	50304.52	-180	2174949.84	17012722.72	884.9	0.437	0.24782	29.5	0.503	0.007	0.00212	17.3	88.4	0.007
26	50304.52	-175	2174952.87	17012718.74	884.9	0.461	0.26146	29.6	0.53	0.007	0.00222	17.2	88.3	0.007
27	50304.52	-170	2174955.9	17012714.76	884.9	0.487	0.27626	29.6	0.56	0.008	0.00233	17.2	88.3	0.008
28	50304.52	-165	2174958.93	17012710.79	884.9	0.515	0.29236	29.6	0.592	0.008	0.00245	17.2	88.3	0.008
29	50304.52	-160	2174961.96	17012706.81	884.9	0.545	0.3099	29.6	0.627	0.008	0.00257	17.2	88.2	0.009
30	50304.52	-155	2174964.99	17012702.83	884.9	0.578	0.32907	29.7	0.665	0.009	0.00271	17.2	88.2	0.009
31	50304.52	-150	2174968.02	17012698.86	884.9	0.614	0.35006	29.7	0.707	0.009	0.00285	17.2	88.2	0.01
32	50304.52	-145	2174971.05	17012694.88	884.9	0.654	0.37312	29.7	0.753	0.01	0.00301	17.2	88.1	0.01
33	50304.52	-140	2174974.08	17012690.9	884.9	0.697	0.39852	29.8	0.803	0.01	0.00317	17.1	88.1	0.011
34	50304.52	-135	2174977.12	17012686.93	884.9	0.745	0.42659	29.8	0.859	0.011	0.00335	17.1	88.1	0.011
35	50304.52	-130	2174980.15	17012682.95	884.9	0.798	0.45769	29.8	0.92	0.012	0.00353	17.1	88	0.012
36	50304.52	-125	2174983.18	17012678.97	884.9	0.857	0.49229	29.9	0.988	0.012	0.00373	17	88	0.013
37	50304.52	-120	2174986.21	17012675	884.9	0.923	0.53091	29.9	1.064	0.013	0.00395	17	88	0.014
38	50304.52	-115	2174989.24	17012671.02	884.9	0.996	0.57418	30	1.149	0.014	0.00417	16.9	88	0.014
39	50304.52	-110	2174992.27	17012667.05	884.9	1.078	0.62286	30	1.245	0.015	0.0044	16.9	88	0.015
40	50304.52	-105	2174995.3	17012663.07	884.9	1.17	0.67788	30.1	1.352	0.015	0.00465	16.8	88	0.016
41	50304.52	-100	2174998.33	17012659.09	884.9	1.274	0.74034	30.2	1.473	0.016	0.00489	16.7	88	0.017
42	50304.52	-95	2175001.36	17012655.12	884.9	1.392	0.81161	30.2	1.611	0.017	0.00514	16.5	88.1	0.018
43	50304.52	-90	2175004.39	17012651.14	884.9	1.527	0.89335	30.3	1.769	0.018	0.00537	16.3	88.2	0.019
44	50304.52	-85	2175007.43	17012647.16	884.9	1.681	0.98762	30.4	1.95	0.019	0.00557	16.1	88.3	0.02
45	50304.52	-80	2175010.46	17012643.19	884.9	1.858	1.09701	30.6	2.158	0.02	0.00573	15.8	88.5	0.021
46	50304.52	-75	2175013.49	17012639.21	884.9	2.063	1.22473	30.7	2.399	0.021	0.00579	15.3	88.8	0.022
47	50304.52	-70	2175016.52	17012635.23	884.9	2.302	1.37486	30.9	2.681	0.022	0.00572	14.7	89.2	0.023
48	50304.52	-65	2175019.55	17012631.26	884.9	2.58	1.55255	31	3.011	0.022	0.00543	13.7	89.9	0.023
49	50304.52	-60	2175022.58	17012627.28	884.9	2.907	1.76435	31.3	3.401	0.022	0.00481	12.2	91	0.023
50	50304.52	-55	2175025.61	17012623.3	884.9	3.293	2.01862	31.5	3.863	0.021	0.00372	9.9	92.7	0.022
51	50304.52	-50	2175028.64	17012619.33	884.9	3.751	2.32598	31.8	4.414	0.019	0.00223	6.6	95.5	0.019
52	50304.52	-45	2175031.67	17012615.35	884.9	4.294	2.69979	32.2	5.072	0.016	0.00306	11	100.2	0.016
53	50304.52	-40	2175034.7	17012611.37	884.9	4.94	3.15652	32.6	5.862	0.01	0.008	37.7	100	0.012
54	50304.52	-35	2175037.73	17012607.4	884.9	5.706	3.71548	33.1	6.809	0.007	0.01625	65.3	62.3	0.017
55	50304.52	-30	2175040.77	17012603.42	884.9	6.607	4.39724	33.6	7.937	0.019	0.02888	56.6	66.8	0.034



56	50304.52	-25	2175043.8	17012599.44	884.9	7.651	5.2187	34.3	9.261	0.04	0.0475	50	71.5	0.062
57	50304.52	-20	2175046.83	17012595.47	884.9	8.823	6.18203	35	10.773	0.068	0.07361	47.2	74.9	0.1
58	50304.52	-15	2175049.86	17012591.49	884.9	10.071	7.25398	35.8	12.412	0.103	0.10756	46.2	77.8	0.149
59	50304.52	-10	2175052.89	17012587.51	884.9	11.281	8.3368	36.5	14.027	0.141	0.14644	46.1	80.9	0.203
60	50304.52	-5	2175055.92	17012583.54	884.9	12.266	9.24948	37	15.363	0.174	0.18232	46.3	84.4	0.252
61	50304.52	0	2175058.95	17012579.56	884.9	12.805	9.76251	37.3	16.102	0.194	0.20337	46.4	88.3	0.281
62	50304.52	5	2175061.98	17012575.58	884.9	12.747	9.71219	37.3	16.026	0.192	0.20063	46.3	92.4	0.278
63	50304.52	10	2175065.01	17012571.61	884.9	12.11	9.11586	37	15.157	0.17	0.17523	45.9	96.3	0.244
64	50304.52	15	2175068.04	17012567.63	884.9	11.066	8.15849	36.4	13.748	0.135	0.13747	45.5	99.7	0.193
65	50304.52	20	2175071.08	17012563.65	884.9	9.836	7.06722	35.7	12.112	0.097	0.09882	45.4	102.8	0.139
66	50304.52	25	2175074.11	17012559.68	884.9	8.595	6.00905	35	10.487	0.064	0.06622	46.2	105.8	0.092
67	50304.52	30	2175077.14	17012555.7	884.9	7.444	5.0687	34.3	9.006	0.036	0.04169	48.8	109.6	0.055
68	50304.52	35	2175080.17	17012551.72	884.9	6.426	4.27154	33.6	7.716	0.017	0.02451	55.3	115.4	0.03
69	50304.52	40	2175083.2	17012547.75	884.9	5.551	3.61181	33.1	6.622	0.007	0.01303	61.8	121.9	0.013
70	50304.52	45	2175086.23	17012543.77	884.9	4.808	3.07145	32.6	5.705	0.011	0.00575	28	72.8	0.011
71	50304.52	50	2175089.26	17012539.79	884.9	4.182	2.62992	32.2	4.94	0.016	0.00222	7.9	79.7	0.016
72	50304.52	55	2175092.29	17012535.82	884.9	3.656	2.26832	31.8	4.302	0.019	0.00323	9.5	84.8	0.019
73	50304.52	60	2175095.32	17012531.84	884.9	3.213	1.97073	31.5	3.769	0.021	0.0047	12.6	87.5	0.022
74	50304.52	65	2175098.35	17012527.86	884.9	2.838	1.72428	31.3	3.321	0.022	0.0056	14.4	89.2	0.023
75	50304.52	70	2175101.39	17012523.89	884.9	2.521	1.51876	31.1	2.943	0.022	0.00606	15.5	90.2	0.023
76	50304.52	75	2175104.42	17012519.91	884.9	2.25	1.34615	30.9	2.622	0.021	0.00622	16.2	90.8	0.022
77	50304.52	80	2175107.45	17012515.93	884.9	2.019	1.20015	30.7	2.348	0.021	0.0062	16.7	91.2	0.022
78	50304.52	85	2175110.48	17012511.96	884.9	1.819	1.0758	30.6	2.113	0.02	0.00605	17	91.5	0.021
79	50304.52	90	2175113.51	17012507.98	884.9	1.646	0.9692	30.5	1.91	0.019	0.00584	17.2	91.7	0.02
80	50304.52	95	2175116.54	17012504.01	884.9	1.496	0.87724	30.4	1.734	0.018	0.00559	17.3	91.8	0.019
81	50304.52	100	2175119.57	17012500.03	884.9	1.365	0.79743	30.3	1.581	0.017	0.00532	17.4	91.9	0.018
82	50304.52	105	2175122.6	17012496.05	884.9	1.25	0.7278	30.2	1.446	0.016	0.00504	17.5	92	0.017
83	50304.52	110	2175125.63	17012492.08	884.9	1.148	0.66672	30.1	1.328	0.015	0.00477	17.5	92	0.016
84	50304.52	115	2175128.66	17012488.1	884.9	1.058	0.61288	30.1	1.223	0.014	0.00451	17.6	92	0.015
85	50304.52	120	2175131.69	17012484.12	884.9	0.978	0.56521	30	1.129	0.013	0.00426	17.6	92	0.014
86	50304.52	125	2175134.73	17012480.15	884.9	0.906	0.52281	30	1.046	0.013	0.00402	17.6	92	0.013
87	50304.52	130	2175137.76	17012476.17	884.9	0.842	0.48495	29.9	0.972	0.012	0.0038	17.6	92	0.013
88	50304.52	135	2175140.79	17012472.19	884.9	0.785	0.45101	29.9	0.905	0.011	0.00359	17.6	91.9	0.012
89	50304.52	140	2175143.82	17012468.22	884.9	0.733	0.42048	29.9	0.845	0.011	0.0034	17.7	91.9	0.011
90	50304.52	145	2175146.85	17012464.24	884.9	0.686	0.39292	29.8	0.79	0.01	0.00321	17.7	91.9	0.011
91	50304.52	150	2175149.88	17012460.26	884.9	0.643	0.36797	29.8	0.741	0.01	0.00304	17.7	91.9	0.01
92	50304.52	155	2175152.91	17012456.29	884.9	0.604	0.34531	29.8	0.696	0.009	0.00288	17.7	91.8	0.01
93	50304.52	160	2175155.94	17012452.31	884.9	0.569	0.32467	29.7	0.655	0.009	0.00273	17.7	91.8	0.009
94	50304.52	165	2175158.97	17012448.33	884.9	0.536	0.30582	29.7	0.617	0.008	0.0026	17.7	91.8	0.009
95	50304.52	170	2175162	17012444.36	884.9	0.506	0.28857	29.7	0.583	0.008	0.00247	17.6	91.7	0.008
96	50304.52	175	2175165.04	17012440.38	884.9	0.479	0.27273	29.7	0.551	0.007	0.00235	17.6	91.7	0.008
97	50304.52	180	2175168.07	17012436.4	884.9	0.454	0.25816	29.6	0.522	0.007	0.00223	17.6	91.7	0.007
98	50304.52	185	2175171.1	17012432.43	884.9	0.431	0.24473	29.6	0.495	0.007	0.00213	17.6	91.6	0.007
99	50304.52	190	2175174.13	17012428.45	884.9	0.409	0.23232	29.6	0.47	0.006	0.00203	17.6	91.6	0.007
100	50304.52	195	2175177.16	17012424.47	884.9	0.389	0.22083	29.6	0.447	0.006	0.00194	17.6	91.6	0.006
101	50304.52	200	2175180.19	17012420.5	884.9	0.371	0.21018	29.6	0.426	0.006	0.00185	17.6	91.5	0.006
102	50304.52	205	2175183.22	17012416.52	884.9	0.353	0.20029	29.5	0.406	0.006	0.00177	17.6	91.5	0.006
103	50304.52	210	2175186.25	17012412.54	884.9	0.337	0.19108	29.5	0.388	0.005	0.00169	17.6	91.5	0.006
104	50304.52	215	2175189.28	17012408.57	884.9	0.322	0.1825	29.5	0.37	0.005	0.00162	17.6	91.5	0.005
105	50304.52	220	2175192.31	17012404.59	884.9	0.308	0.17448	29.5	0.354	0.005	0.00156	17.6	91.4	0.005
106	50304.52	225	2175195.35	17012400.61	884.9	0.295	0.16699	29.5	0.339	0.005	0.00149	17.6	91.4	0.005
107	50304.52	230	2175198.38	17012396.64	884.9	0.283	0.15998	29.5	0.325	0.005	0.00143	17.6	91.4	0.005
108	50304.52	235	2175201.41	17012392.66	884.9	0.272	0.1534	29.5	0.312	0.004	0.00138	17.6	91.4	0.005
109	50304.52	240	2175204.44	17012388.68	884.9	0.261	0.14722	29.4	0.299	0.004	0.00132	17.6	91.3	0.004
110	50304.52	245	2175207.47	17012384.71	884.9	0.251	0.14142	29.4	0.288	0.004	0.00127	17.6	91.3	0.004
111	50304.52	250	2175210.5	17012380.73	884.9	0.241	0.13595	29.4	0.277	0.004	0.00123	17.6	91.3	0.004

112	50304.52	255	2175213.53	17012376.75	884.9	0.232	0.1308	29.4	0.266	0.004	0.00118	17.6	91.3	0.004
113	50304.52	260	2175216.56	17012372.78	884.9	0.224	0.12595	29.4	0.257	0.004	0.00114	17.6	91.2	0.004
114	50304.52	265	2175219.59	17012368.8	884.9	0.216	0.12136	29.4	0.247	0.003	0.0011	17.6	91.2	0.004
115	50304.52	270	2175222.62	17012364.82	884.9	0.208	0.11702	29.4	0.239	0.003	0.00106	17.6	91.2	0.004
116	50304.52	275	2175225.65	17012360.85	884.9	0.201	0.11292	29.4	0.23	0.003	0.00102	17.6	91.2	0.003
117	50304.52	280	2175228.69	17012356.87	884.9	0.194	0.10903	29.4	0.222	0.003	0.00099	17.6	91.2	0.003
118	50304.52	285	2175231.72	17012352.89	884.9	0.187	0.10534	29.3	0.215	0.003	0.00096	17.6	91.1	0.003
119	50304.52	290	2175234.75	17012348.92	884.9	0.181	0.10184	29.3	0.208	0.003	0.00092	17.6	91.1	0.003
120	50304.52	295	2175237.78	17012344.94	884.9	0.175	0.09852	29.3	0.201	0.003	0.00089	17.6	91.1	0.003
121	50304.52	300	2175240.81	17012340.97	884.9	0.17	0.09536	29.3	0.195	0.003	0.00087	17.6	91.1	0.003

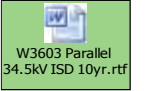
Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	11754.53	-300	2165527.8	16978343.73	789.3	0.279	0.16176	30.1	0.323	0.004	0.00102	13.3	88.9	0.004
2	11754.53	-295	2165532.8	16978343.85	789.3	0.288	0.16723	30.1	0.333	0.004	0.00105	13.3	88.9	0.005
3	11754.53	-290	2165537.8	16978343.97	789.3	0.298	0.17298	30.1	0.345	0.005	0.00108	13.3	88.9	0.005
4	11754.53	-285	2165542.79	16978344.08	789.3	0.309	0.17903	30.1	0.357	0.005	0.00112	13.3	88.9	0.005
5	11754.53	-280	2165547.79	16978344.2	789.3	0.32	0.1854	30.1	0.37	0.005	0.00115	13.2	88.8	0.005
6	11754.53	-275	2165552.79	16978344.31	789.3	0.331	0.19212	30.1	0.383	0.005	0.00119	13.2	88.8	0.005
7	11754.53	-270	2165557.79	16978344.43	789.3	0.343	0.1992	30.1	0.397	0.005	0.00123	13.2	88.8	0.005
8	11754.52	-265	2165562.79	16978344.54	789.3	0.356	0.20669	30.1	0.412	0.005	0.00128	13.2	88.8	0.006
9	11754.52	-260	2165567.79	16978344.66	789.3	0.37	0.2146	30.1	0.428	0.006	0.00132	13.2	88.8	0.006
10	11754.52	-255	2165572.79	16978344.77	789.3	0.384	0.22297	30.1	0.444	0.006	0.00137	13.2	88.8	0.006
11	11754.52	-250	2165577.78	16978344.89	789.3	0.399	0.23184	30.1	0.462	0.006	0.00142	13.2	88.7	0.006
12	11754.52	-245	2165582.78	16978345.01	789.3	0.415	0.24125	30.1	0.48	0.006	0.00147	13.2	88.7	0.006
13	11754.52	-240	2165587.78	16978345.12	789.3	0.433	0.25124	30.1	0.5	0.007	0.00152	13.2	88.7	0.007
14	11754.52	-235	2165592.78	16978345.24	789.3	0.451	0.26185	30.2	0.521	0.007	0.00158	13.1	88.7	0.007
15	11754.52	-230	2165597.78	16978345.35	789.3	0.47	0.27315	30.2	0.544	0.007	0.00164	13.1	88.6	0.007
16	11754.52	-225	2165602.78	16978345.47	789.3	0.491	0.2852	30.2	0.568	0.007	0.00171	13.1	88.6	0.008
17	11754.52	-220	2165607.78	16978345.58	789.3	0.513	0.29805	30.2	0.593	0.008	0.00177	13.1	88.6	0.008
18	11754.52	-215	2165612.78	16978345.7	789.3	0.536	0.31178	30.2	0.62	0.008	0.00185	13.1	88.6	0.008
19	11754.52	-210	2165617.77	16978345.81	789.3	0.561	0.32648	30.2	0.649	0.008	0.00192	13	88.5	0.009
20	11754.52	-205	2165622.77	16978345.93	789.3	0.588	0.34223	30.2	0.68	0.009	0.002	13	88.5	0.009
21	11754.51	-200	2165627.77	16978346.05	789.3	0.617	0.35915	30.2	0.714	0.009	0.00209	13	88.5	0.009
22	11754.51	-195	2165632.77	16978346.16	789.3	0.648	0.37733	30.2	0.75	0.009	0.00218	13	88.5	0.01
23	11754.51	-190	2165637.77	16978346.28	789.3	0.681	0.39693	30.2	0.788	0.01	0.00227	12.9	88.4	0.01
24	11754.51	-185	2165642.77	16978346.39	789.3	0.717	0.41807	30.2	0.83	0.01	0.00237	12.9	88.4	0.011
25	11754.51	-180	2165647.77	16978346.51	789.3	0.756	0.44093	30.3	0.875	0.011	0.00248	12.8	88.4	0.011
26	11754.51	-175	2165652.76	16978346.62	789.3	0.798	0.46569	30.3	0.924	0.011	0.00259	12.8	88.3	0.012
27	11754.51	-170	2165657.76	16978346.74	789.3	0.843	0.49258	30.3	0.977	0.012	0.00271	12.8	88.3	0.012
28	11754.51	-165	2165662.76	16978346.85	789.3	0.893	0.52183	30.3	1.034	0.013	0.00283	12.7	88.3	0.013
29	11754.51	-160	2165667.76	16978346.97	789.3	0.947	0.55374	30.3	1.097	0.013	0.00296	12.6	88.3	0.014
30	11754.51	-155	2165672.76	16978347.09	789.3	1.005	0.58862	30.3	1.165	0.014	0.0031	12.6	88.2	0.014
31	11754.51	-150	2165677.76	16978347.2	789.3	1.07	0.62685	30.4	1.24	0.015	0.00325	12.5	88.2	0.015
32	11754.51	-145	2165682.76	16978347.32	789.3	1.14	0.66887	30.4	1.322	0.015	0.0034	12.4	88.2	0.016
33	11754.51	-140	2165687.76	16978347.43	789.3	1.218	0.71519	30.4	1.412	0.016	0.00356	12.3	88.2	0.017
34	11754.5	-135	2165692.75	16978347.55	789.3	1.304	0.76639	30.4	1.512	0.017	0.00372	12.2	88.1	0.018
35	11754.5	-130	2165697.75	16978347.66	789.3	1.398	0.82318	30.5	1.623	0.018	0.00388	12.1	88.1	0.019
36	11754.5	-125	2165702.75	16978347.78	789.3	1.504	0.88639	30.5	1.745	0.019	0.00405	11.9	88.1	0.02
37	11754.5	-120	2165707.75	16978347.9	789.3	1.621	0.95698	30.6	1.882	0.02	0.00422	11.7	88.1	0.021
38	11754.5	-115	2165712.75	16978348.01	789.3	1.752	1.03612	30.6	2.035	0.021	0.00437	11.5	88.1	0.022
39	11754.5	-110	2165717.75	16978348.13	789.3	1.898	1.12521	30.7	2.207	0.023	0.00451	11.2	88.1	0.023
40	11754.5	-105	2165722.75	16978348.24	789.3	2.064	1.22593	30.7	2.4	0.024	0.00463	10.9	88.2	0.024
41	11754.5	-100	2165727.74	16978348.36	789.3	2.25	1.3403	30.8	2.619	0.025	0.00471	10.5	88.3	0.026
42	11754.5	-95	2165732.74	16978348.47	789.3	2.462	1.47081	30.9	2.868	0.027	0.00472	10	88.4	0.027
43	11754.5	-90	2165737.74	16978348.59	789.3	2.704	1.62049	30.9	3.152	0.028	0.00464	9.4	88.5	0.028
44	11754.5	-85	2165742.74	16978348.7	789.3	2.98	1.79305	31	3.478	0.029	0.00442	8.6	88.7	0.03
45	11754.5	-80	2165747.74	16978348.82	789.3	3.298	1.99311	31.1	3.853	0.03	0.00401	7.6	89.1	0.03
46	11754.5	-75	2165752.74	16978348.94	789.3	3.665	2.22637	31.3	4.288	0.031	0.00332	6.1	89.5	0.031
47	11754.49	-70	2165757.74	16978349.05	789.3	4.091	2.49994	31.4	4.795	0.031	0.0023	4.2	90.2	0.031
48	11754.49	-65	2165762.74	16978349.17	789.3	4.588	2.82265	31.6	5.387	0.031	0.00138	2.6	91.1	0.031
49	11754.49	-60	2165767.73	16978349.28	789.3	5.169	3.20544	31.8	6.082	0.029	0.0031	6	92.5	0.029
50	11754.49	-55	2165772.73	16978349.4	789.3	5.85	3.66175	32	6.901	0.026	0.00706	15.1	94.1	0.027
51	11754.49	-50	2165777.73	16978349.51	789.3	6.649	4.20777	32.3	7.869	0.021	0.01315	32.4	93.8	0.024
52	11754.49	-45	2165782.73	16978349.63	789.3	7.587	4.86224	32.7	9.011	0.013	0.02216	59.5	83	0.024
53	11754.49	-40	2165787.73	16978349.74	789.3	8.681	5.64538	33	10.355	0.011	0.03527	73.3	72.3	0.036
54	11754.49	-35	2165792.73	16978349.86	789.3	9.946	6.57561	33.5	11.923	0.027	0.05403	63.4	72.4	0.06



55	11754.49	-30	2165797.73	16978349.98	789.3	11.38	7.66277	34	13.719	0.054	0.08016	55.8	74.5	0.097
56	11754.49	-25	2165802.72	16978350.09	789.3	12.956	8.89564	34.5	15.716	0.091	0.11509	51.7	76.8	0.147
57	11754.49	-20	2165807.72	16978350.21	789.3	14.605	10.22379	35	17.827	0.135	0.15877	49.6	79	0.208
58	11754.49	-15	2165812.72	16978350.32	789.3	16.196	11.5402	35.5	19.887	0.183	0.2081	48.7	81.4	0.277
59	11754.49	-10	2165817.72	16978350.44	789.3	17.549	12.68136	35.9	21.651	0.228	0.25571	48.3	84.1	0.343
60	11754.48	-5	2165822.72	16978350.55	789.3	18.465	13.46318	36.1	22.852	0.261	0.29099	48.1	87	0.391
61	11754.48	0	2165827.72	16978350.67	789.3	18.791	13.74293	36.2	23.28	0.273	0.30417	48.1	90	0.409
62	11754.48	5	2165832.72	16978350.78	789.3	18.47	13.46789	36.1	22.859	0.261	0.29127	48.1	93	0.391
63	11754.48	10	2165837.72	16978350.9	789.3	17.559	12.69023	35.9	21.665	0.229	0.2562	48.3	95.9	0.343
64	11754.48	15	2165842.71	16978351.02	789.3	16.21	11.55201	35.5	19.905	0.184	0.20868	48.6	98.5	0.278
65	11754.48	20	2165847.71	16978351.13	789.3	14.621	10.23696	35	17.848	0.136	0.15934	49.6	100.9	0.209
66	11754.48	25	2165852.71	16978351.25	789.3	12.973	8.90876	34.5	15.737	0.091	0.11558	51.7	103.2	0.147
67	11754.48	30	2165857.71	16978351.36	789.3	11.396	7.67493	34	13.739	0.055	0.08055	55.7	105.4	0.097
68	11754.48	35	2165862.71	16978351.48	789.3	9.96	6.58638	33.5	11.941	0.027	0.05432	63.2	107.6	0.06
69	11754.48	40	2165867.71	16978351.59	789.3	8.694	5.65467	33	10.371	0.011	0.03548	73.3	107.7	0.036
70	11754.48	45	2165872.71	16978351.71	789.3	7.598	4.87014	32.7	9.025	0.013	0.02231	59.9	97.3	0.024
71	11754.48	50	2165877.7	16978351.82	789.3	6.659	4.21443	32.3	7.88	0.021	0.01326	32.8	86.3	0.024
72	11754.48	55	2165882.7	16978351.94	789.3	5.858	3.66737	32	6.911	0.026	0.00714	15.4	85.9	0.027
73	11754.47	60	2165887.7	16978352.06	789.3	5.176	3.21018	31.8	6.091	0.029	0.00315	6.2	87.5	0.029
74	11754.47	65	2165892.7	16978352.17	789.3	4.594	2.82666	31.6	5.394	0.031	0.00138	2.6	88.8	0.031
75	11754.47	70	2165897.7	16978352.29	789.3	4.097	2.50335	31.4	4.801	0.031	0.00227	4.2	89.8	0.031
76	11754.47	75	2165902.7	16978352.4	789.3	3.67	2.22928	31.3	4.294	0.031	0.0033	6.1	90.5	0.031
77	11754.47	80	2165907.7	16978352.52	789.3	3.302	1.99561	31.1	3.858	0.03	0.00399	7.5	90.9	0.03
78	11754.47	85	2165912.7	16978352.63	789.3	2.983	1.79521	31	3.482	0.029	0.00441	8.6	91.3	0.029
79	11754.47	90	2165917.69	16978352.75	789.3	2.707	1.62236	30.9	3.156	0.028	0.00463	9.4	91.5	0.028
80	11754.47	95	2165922.69	16978352.86	789.3	2.465	1.47244	30.9	2.871	0.027	0.00471	10	91.6	0.027
81	11754.47	100	2165927.69	16978352.98	789.3	2.253	1.34173	30.8	2.622	0.025	0.0047	10.5	91.7	0.026
82	11754.47	105	2165932.69	16978353.1	789.3	2.066	1.22718	30.7	2.403	0.024	0.00463	10.9	91.8	0.024
83	11754.47	110	2165937.69	16978353.21	789.3	1.9	1.12632	30.7	2.209	0.023	0.00451	11.2	91.9	0.023
84	11754.47	115	2165942.69	16978353.33	789.3	1.753	1.03711	30.6	2.037	0.022	0.00437	11.5	91.9	0.022
85	11754.47	120	2165947.69	16978353.44	789.3	1.622	0.95786	30.6	1.884	0.02	0.00421	11.7	91.9	0.021
86	11754.46	125	2165952.68	16978353.56	789.3	1.505	0.88717	30.5	1.747	0.019	0.00405	11.9	91.9	0.02
87	11754.46	130	2165957.68	16978353.67	789.3	1.4	0.82389	30.5	1.624	0.018	0.00388	12	91.9	0.019
88	11754.46	135	2165962.68	16978353.79	789.3	1.305	0.76703	30.5	1.514	0.017	0.00372	12.2	91.9	0.018
89	11754.46	140	2165967.68	16978353.9	789.3	1.219	0.71576	30.4	1.414	0.016	0.00356	12.3	91.8	0.017
90	11754.46	145	2165972.68	16978354.02	789.3	1.141	0.66939	30.4	1.323	0.015	0.0034	12.4	91.8	0.016
91	11754.46	150	2165977.68	16978354.14	789.3	1.071	0.62733	30.4	1.241	0.015	0.00325	12.5	91.8	0.015
92	11754.46	155	2165982.68	16978354.25	789.3	1.006	0.58905	30.3	1.166	0.014	0.0031	12.6	91.8	0.014
93	11754.46	160	2165987.68	16978354.37	789.3	0.947	0.55413	30.3	1.097	0.013	0.00296	12.6	91.7	0.014
94	11754.46	165	2165992.67	16978354.48	789.3	0.893	0.5222	30.3	1.035	0.013	0.00283	12.7	91.7	0.013
95	11754.46	170	2165997.67	16978354.6	789.3	0.844	0.49291	30.3	0.977	0.012	0.00271	12.7	91.7	0.012
96	11754.46	175	2166002.67	16978354.71	789.3	0.798	0.466	30.3	0.924	0.011	0.00259	12.8	91.7	0.012
97	11754.46	180	2166007.67	16978354.83	789.3	0.756	0.44121	30.3	0.876	0.011	0.00248	12.8	91.6	0.011
98	11754.46	185	2166012.67	16978354.94	789.3	0.717	0.41833	30.2	0.83	0.01	0.00237	12.9	91.6	0.011
99	11754.45	190	2166017.67	16978355.06	789.3	0.681	0.39717	30.2	0.789	0.01	0.00227	12.9	91.6	0.01
100	11754.45	195	2166022.67	16978355.18	789.3	0.648	0.37756	30.2	0.75	0.009	0.00218	12.9	91.5	0.01
101	11754.45	200	2166027.66	16978355.29	789.3	0.617	0.35936	30.2	0.714	0.009	0.00209	13	91.5	0.009
102	11754.45	205	2166032.66	16978355.41	789.3	0.588	0.34243	30.2	0.681	0.009	0.002	13	91.5	0.009
103	11754.45	210	2166037.66	16978355.52	789.3	0.561	0.32666	30.2	0.65	0.008	0.00192	13	91.5	0.009
104	11754.45	215	2166042.66	16978355.64	789.3	0.536	0.31195	30.2	0.62	0.008	0.00185	13.1	91.4	0.008
105	11754.45	220	2166047.66	16978355.75	789.3	0.513	0.29821	30.2	0.593	0.008	0.00177	13.1	91.4	0.008
106	11754.45	225	2166052.66	16978355.87	789.3	0.491	0.28534	30.2	0.568	0.007	0.00171	13.1	91.4	0.008
107	11754.45	230	2166057.66	16978355.98	789.3	0.47	0.27329	30.2	0.544	0.007	0.00164	13.1	91.4	0.007
108	11754.45	235	2166062.66	16978356.1	789.3	0.451	0.26198	30.2	0.522	0.007	0.00158	13.1	91.3	0.007
109	11754.45	240	2166067.65	16978356.22	789.3	0.433	0.25136	30.1	0.5	0.007	0.00152	13.1	91.3	0.007

110	11754.45	245	2166072.65	16978356.33	789.3	0.416	0.24136	30.1	0.481	0.006	0.00147	13.2	91.3	0.006
111	11754.45	250	2166077.65	16978356.45	789.3	0.4	0.23195	30.1	0.462	0.006	0.00142	13.2	91.3	0.006
112	11754.44	255	2166082.65	16978356.56	789.3	0.384	0.22308	30.1	0.444	0.006	0.00137	13.2	91.2	0.006
113	11754.44	260	2166087.65	16978356.68	789.3	0.37	0.2147	30.1	0.428	0.006	0.00132	13.2	91.2	0.006
114	11754.44	265	2166092.65	16978356.79	789.3	0.356	0.20678	30.1	0.412	0.005	0.00128	13.2	91.2	0.006
115	11754.44	270	2166097.65	16978356.91	789.3	0.344	0.19929	30.1	0.397	0.005	0.00123	13.2	91.2	0.005
116	11754.44	275	2166102.64	16978357.02	789.3	0.331	0.1922	30.1	0.383	0.005	0.00119	13.2	91.2	0.005
117	11754.44	280	2166107.64	16978357.14	789.3	0.32	0.18548	30.1	0.37	0.005	0.00115	13.2	91.2	0.005
118	11754.44	285	2166112.64	16978357.26	789.3	0.309	0.1791	30.1	0.357	0.005	0.00112	13.3	91.1	0.005
119	11754.44	290	2166117.64	16978357.37	789.3	0.298	0.17305	30.1	0.345	0.005	0.00108	13.3	91.1	0.005
120	11754.44	295	2166122.64	16978357.49	789.3	0.289	0.1673	30.1	0.334	0.004	0.00105	13.3	91.1	0.005
121	11754.44	300	2166127.64	16978357.6	789.3	0.279	0.16183	30.1	0.323	0.004	0.00102	13.3	91.1	0.004

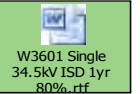
Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	52059.09	-300	2174075.43	17012228.98	836.32	0.2	0.11608	30.2	0.231	0.003	0.001	18.4	88.9	0.003
2	52059.09	-295	2174080.43	17012229.11	836.32	0.206	0.11976	30.2	0.238	0.003	0.00103	18.4	88.9	0.003
3	52059.09	-290	2174085.43	17012229.23	836.32	0.213	0.12362	30.2	0.246	0.003	0.00107	18.4	88.9	0.003
4	52059.09	-285	2174090.43	17012229.36	836.32	0.219	0.12768	30.2	0.254	0.003	0.0011	18.4	88.9	0.003
5	52059.09	-280	2174095.43	17012229.48	836.32	0.227	0.13195	30.2	0.262	0.003	0.00114	18.4	88.9	0.004
6	52059.09	-275	2174100.43	17012229.61	836.32	0.234	0.13646	30.2	0.271	0.004	0.00118	18.4	88.8	0.004
7	52059.09	-270	2174105.42	17012229.73	836.32	0.243	0.14121	30.2	0.281	0.004	0.00122	18.4	88.8	0.004
8	52059.09	-265	2174110.42	17012229.86	836.32	0.251	0.14622	30.2	0.291	0.004	0.00126	18.4	88.8	0.004
9	52059.09	-260	2174115.42	17012229.98	836.32	0.26	0.15152	30.2	0.301	0.004	0.0013	18.4	88.8	0.004
10	52059.09	-255	2174120.42	17012230.11	836.32	0.27	0.15712	30.2	0.312	0.004	0.00135	18.4	88.8	0.004
11	52059.09	-250	2174125.42	17012230.23	836.32	0.28	0.16305	30.2	0.324	0.004	0.0014	18.4	88.8	0.004
12	52059.09	-245	2174130.42	17012230.36	836.32	0.291	0.16933	30.2	0.336	0.004	0.00145	18.4	88.7	0.005
13	52059.09	-240	2174135.41	17012230.48	836.32	0.302	0.17601	30.2	0.349	0.005	0.00151	18.4	88.7	0.005
14	52059.09	-235	2174140.41	17012230.61	836.32	0.314	0.18309	30.3	0.363	0.005	0.00157	18.4	88.7	0.005
15	52059.09	-230	2174145.41	17012230.73	836.32	0.327	0.19063	30.3	0.378	0.005	0.00163	18.4	88.7	0.005
16	52059.09	-225	2174150.41	17012230.86	836.32	0.34	0.19866	30.3	0.394	0.005	0.00169	18.4	88.6	0.005
17	52059.09	-220	2174155.41	17012230.98	836.32	0.355	0.20722	30.3	0.411	0.005	0.00176	18.4	88.6	0.006
18	52059.09	-215	2174160.41	17012231.1	836.32	0.37	0.21636	30.3	0.429	0.006	0.00183	18.4	88.6	0.006
19	52059.09	-210	2174165.41	17012231.23	836.32	0.387	0.22614	30.3	0.448	0.006	0.00191	18.4	88.6	0.006
20	52059.09	-205	2174170.4	17012231.35	836.32	0.405	0.23661	30.3	0.469	0.006	0.00199	18.4	88.6	0.006
21	52059.09	-200	2174175.4	17012231.48	836.32	0.424	0.24784	30.3	0.491	0.006	0.00208	18.4	88.5	0.007
22	52059.09	-195	2174180.4	17012231.6	836.32	0.444	0.25991	30.3	0.514	0.007	0.00217	18.4	88.5	0.007
23	52059.09	-190	2174185.4	17012231.73	836.32	0.466	0.2729	30.4	0.54	0.007	0.00226	18.4	88.5	0.007
24	52059.09	-185	2174190.4	17012231.85	836.32	0.489	0.28691	30.4	0.567	0.007	0.00237	18.4	88.5	0.008
25	52059.09	-180	2174195.4	17012231.98	836.32	0.515	0.30203	30.4	0.597	0.007	0.00248	18.4	88.4	0.008
26	52059.09	-175	2174200.39	17012232.1	836.32	0.542	0.31841	30.4	0.629	0.008	0.00259	18.4	88.4	0.008
27	52059.09	-170	2174205.39	17012232.23	836.32	0.572	0.33616	30.4	0.663	0.008	0.00272	18.4	88.4	0.009
28	52059.09	-165	2174210.39	17012232.35	836.32	0.604	0.35546	30.5	0.701	0.009	0.00285	18.4	88.4	0.009
29	52059.09	-160	2174215.39	17012232.48	836.32	0.639	0.37647	30.5	0.742	0.009	0.00299	18.4	88.3	0.009
30	52059.09	-155	2174220.39	17012232.6	836.32	0.678	0.39942	30.5	0.786	0.009	0.00314	18.4	88.3	0.01
31	52059.09	-150	2174225.39	17012232.73	836.32	0.719	0.42454	30.6	0.835	0.01	0.00329	18.3	88.3	0.01
32	52059.09	-145	2174230.39	17012232.85	836.32	0.765	0.4521	30.6	0.889	0.01	0.00346	18.3	88.3	0.011
33	52059.09	-140	2174235.38	17012232.98	836.32	0.815	0.48243	30.6	0.947	0.011	0.00364	18.3	88.3	0.012
34	52059.09	-135	2174240.38	17012233.1	836.32	0.87	0.5159	30.7	1.012	0.012	0.00382	18.3	88.2	0.012
35	52059.09	-130	2174245.38	17012233.23	836.32	0.931	0.55296	30.7	1.083	0.012	0.00402	18.3	88.2	0.013
36	52059.09	-125	2174250.38	17012233.35	836.32	0.998	0.59411	30.8	1.162	0.013	0.00422	18.2	88.2	0.013
37	52059.09	-120	2174255.38	17012233.48	836.32	1.073	0.63997	30.8	1.249	0.013	0.00443	18.2	88.3	0.014
38	52059.09	-115	2174260.38	17012233.6	836.32	1.156	0.69126	30.9	1.347	0.014	0.00464	18.1	88.3	0.015
39	52059.09	-110	2174265.37	17012233.72	836.32	1.249	0.74884	30.9	1.456	0.015	0.00486	18.1	88.3	0.016
40	52059.09	-105	2174270.37	17012233.85	836.32	1.353	0.81374	31	1.579	0.016	0.00507	18	88.4	0.016
41	52059.09	-100	2174275.37	17012233.97	836.32	1.47	0.88721	31.1	1.717	0.016	0.00527	17.8	88.5	0.017
42	52059.09	-95	2174280.37	17012234.1	836.32	1.602	0.97076	31.2	1.873	0.017	0.00544	17.7	88.6	0.018
43	52059.09	-90	2174285.37	17012234.22	836.32	1.752	1.0662	31.3	2.051	0.018	0.00557	17.4	88.8	0.019
44	52059.09	-85	2174290.37	17012234.35	836.32	1.922	1.17577	31.5	2.253	0.018	0.00563	17.1	89.1	0.019
45	52059.09	-80	2174295.36	17012234.47	836.32	2.116	1.3022	31.6	2.485	0.019	0.00559	16.6	89.5	0.02
46	52059.09	-75	2174300.36	17012234.6	836.32	2.339	1.44887	31.8	2.751	0.019	0.00538	15.8	90.1	0.02
47	52059.09	-70	2174305.36	17012234.72	836.32	2.596	1.61992	32	3.06	0.019	0.00495	14.7	91	0.019
48	52059.09	-65	2174310.36	17012234.85	836.32	2.892	1.82048	32.2	3.417	0.018	0.00417	12.9	92.3	0.019
49	52059.09	-60	2174315.36	17012234.97	836.32	3.234	2.05683	32.5	3.833	0.017	0.00297	10.1	94.5	0.017
50	52059.09	-55	2174320.36	17012235.1	836.32	3.632	2.33668	32.8	4.319	0.014	0.00173	6.9	98.2	0.014
51	52059.09	-50	2174325.36	17012235.22	836.32	4.095	2.66927	33.1	4.888	0.011	0.00348	18.2	103.8	0.011
52	52059.09	-45	2174330.35	17012235.35	836.32	4.631	3.06538	33.5	5.554	0.006	0.00817	53.6	78.4	0.008
53	52059.09	-40	2174335.35	17012235.47	836.32	5.252	3.53695	34	6.332	0.008	0.01537	62.6	64	0.017
54	52059.09	-35	2174340.35	17012235.6	836.32	5.964	4.0957	34.5	7.235	0.019	0.02582	53.2	69.7	0.032



55	52059.09	-30	2174345.35	17012235.72	836.32	6.769	4.75024	35.1	8.269	0.036	0.04051	48.5	73.6	0.054
56	52059.09	-25	2174350.35	17012235.85	836.32	7.658	5.50025	35.7	9.429	0.057	0.06037	46.5	76.3	0.083
57	52059.09	-20	2174355.35	17012235.97	836.32	8.602	6.3267	36.3	10.678	0.083	0.08573	45.8	78.7	0.12
58	52059.09	-15	2174360.34	17012236.09	836.32	9.541	7.17878	37	11.94	0.112	0.11537	45.8	81	0.161
59	52059.09	-10	2174365.34	17012236.22	836.32	10.379	7.96307	37.5	13.082	0.14	0.14555	46.1	83.5	0.202
60	52059.09	-5	2174370.34	17012236.34	836.32	10.99	8.54928	37.9	13.924	0.162	0.1698	46.4	86.4	0.235
61	52059.09	0	2174375.34	17012236.47	836.32	11.256	8.80808	38	14.293	0.172	0.18103	46.5	89.5	0.249
62	52059.09	5	2174380.34	17012236.59	836.32	11.116	8.67277	38	14.099	0.167	0.17534	46.5	92.6	0.242
63	52059.09	10	2174385.34	17012236.72	836.32	10.602	8.17879	37.6	13.39	0.148	0.15478	46.2	95.6	0.214
64	52059.09	15	2174390.34	17012236.84	836.32	9.82	7.44215	37.2	12.322	0.122	0.12583	45.9	98.2	0.175
65	52059.09	20	2174395.33	17012236.97	836.32	8.9	6.59878	36.6	11.079	0.093	0.09551	45.7	100.5	0.133
66	52059.09	25	2174400.33	17012237.09	836.32	7.948	5.756	35.9	9.814	0.066	0.06852	46.1	102.8	0.095
67	52059.09	30	2174405.33	17012237.22	836.32	7.037	4.97764	35.3	8.619	0.043	0.04683	47.6	105.3	0.063
68	52059.09	35	2174410.33	17012237.34	836.32	6.203	4.29142	34.7	7.542	0.025	0.0305	51.1	108.6	0.039
69	52059.09	40	2174415.33	17012237.47	836.32	5.461	3.70238	34.1	6.597	0.011	0.01873	58.7	113.5	0.022
70	52059.09	45	2174420.33	17012237.59	836.32	4.812	3.20395	33.7	5.781	0.005	0.01053	63.9	116	0.011
71	52059.09	50	2174425.32	17012237.72	836.32	4.25	2.78495	33.2	5.081	0.009	0.00501	30	76.2	0.009
72	52059.09	55	2174430.32	17012237.84	836.32	3.765	2.43327	32.9	4.483	0.013	0.0019	8.4	79.8	0.013
73	52059.09	60	2174435.32	17012237.97	836.32	3.348	2.13766	32.6	3.972	0.016	0.00232	8.4	84.3	0.016
74	52059.09	65	2174440.32	17012238.09	836.32	2.989	1.88837	32.3	3.535	0.017	0.00364	11.8	87	0.018
75	52059.09	70	2174445.32	17012238.22	836.32	2.679	1.6772	32.1	3.16	0.018	0.00456	14	88.6	0.019
76	52059.09	75	2174450.32	17012238.34	836.32	2.411	1.49742	31.8	2.838	0.019	0.00512	15.3	89.6	0.019
77	52059.09	80	2174455.32	17012238.47	836.32	2.178	1.34355	31.7	2.559	0.019	0.0054	16.2	90.3	0.019
78	52059.09	85	2174460.31	17012238.59	836.32	1.975	1.21116	31.5	2.317	0.018	0.00551	16.8	90.7	0.019
79	52059.09	90	2174465.31	17012238.71	836.32	1.798	1.09663	31.4	2.106	0.018	0.00549	17.2	91.1	0.019
80	52059.09	95	2174470.31	17012238.84	836.32	1.642	0.99704	31.3	1.921	0.017	0.00539	17.5	91.3	0.018
81	52059.09	100	2174475.31	17012238.96	836.32	1.505	0.91002	31.2	1.759	0.016	0.00524	17.7	91.4	0.017
82	52059.09	105	2174480.31	17012239.09	836.32	1.384	0.8336	31.1	1.616	0.016	0.00505	17.8	91.6	0.016
83	52059.09	110	2174485.31	17012239.21	836.32	1.276	0.76621	31	1.489	0.015	0.00485	17.9	91.6	0.016
84	52059.09	115	2174490.3	17012239.34	836.32	1.18	0.7065	30.9	1.376	0.014	0.00464	18	91.7	0.015
85	52059.09	120	2174495.3	17012239.46	836.32	1.094	0.65339	30.8	1.275	0.014	0.00443	18.1	91.7	0.014
86	52059.09	125	2174500.3	17012239.59	836.32	1.017	0.60597	30.8	1.184	0.013	0.00422	18.1	91.7	0.014
87	52059.09	130	2174505.3	17012239.71	836.32	0.948	0.56347	30.7	1.103	0.012	0.00402	18.2	91.7	0.013
88	52059.09	135	2174510.3	17012239.84	836.32	0.885	0.52525	30.7	1.029	0.012	0.00383	18.2	91.7	0.012
89	52059.09	140	2174515.3	17012239.96	836.32	0.829	0.49076	30.6	0.963	0.011	0.00364	18.2	91.7	0.012
90	52059.09	145	2174520.29	17012240.09	836.32	0.777	0.45954	30.6	0.903	0.011	0.00347	18.2	91.7	0.011
91	52059.09	150	2174525.29	17012240.21	836.32	0.73	0.43121	30.6	0.848	0.01	0.0033	18.3	91.7	0.011
92	52059.09	155	2174530.29	17012240.34	836.32	0.688	0.40541	30.5	0.798	0.01	0.00314	18.3	91.7	0.01
93	52059.09	160	2174535.29	17012240.46	836.32	0.648	0.38186	30.5	0.753	0.009	0.00299	18.3	91.7	0.01
94	52059.09	165	2174540.29	17012240.59	836.32	0.613	0.36031	30.5	0.711	0.009	0.00285	18.3	91.6	0.009
95	52059.09	170	2174545.29	17012240.71	836.32	0.58	0.34055	30.4	0.672	0.008	0.00272	18.3	91.6	0.009
96	52059.09	175	2174550.29	17012240.84	836.32	0.549	0.32238	30.4	0.637	0.008	0.0026	18.3	91.6	0.008
97	52059.09	180	2174555.28	17012240.96	836.32	0.521	0.30563	30.4	0.604	0.007	0.00248	18.3	91.6	0.008
98	52059.09	185	2174560.28	17012241.08	836.32	0.495	0.29018	30.4	0.574	0.007	0.00237	18.3	91.5	0.008
99	52059.09	190	2174565.28	17012241.21	836.32	0.471	0.27588	30.4	0.546	0.007	0.00226	18.3	91.5	0.007
100	52059.09	195	2174570.28	17012241.33	836.32	0.449	0.26263	30.3	0.52	0.007	0.00217	18.3	91.5	0.007
101	52059.09	200	2174575.28	17012241.46	836.32	0.428	0.25032	30.3	0.496	0.006	0.00207	18.3	91.5	0.007
102	52059.09	205	2174580.28	17012241.58	836.32	0.409	0.23888	30.3	0.473	0.006	0.00199	18.3	91.4	0.006
103	52059.09	210	2174585.27	17012241.71	836.32	0.391	0.22821	30.3	0.452	0.006	0.00191	18.3	91.4	0.006
104	52059.09	215	2174590.27	17012241.83	836.32	0.374	0.21826	30.3	0.433	0.006	0.00183	18.3	91.4	0.006
105	52059.09	220	2174595.27	17012241.96	836.32	0.358	0.20897	30.3	0.415	0.005	0.00176	18.3	91.4	0.006
106	52059.09	225	2174600.27	17012242.08	836.32	0.343	0.20027	30.3	0.397	0.005	0.00169	18.3	91.4	0.005
107	52059.09	230	2174605.27	17012242.21	836.32	0.329	0.19211	30.2	0.381	0.005	0.00162	18.3	91.3	0.005
108	52059.09	235	2174610.27	17012242.33	836.32	0.316	0.18446	30.2	0.366	0.005	0.00156	18.3	91.3	0.005
109	52059.09	240	2174615.27	17012242.46	836.32	0.304	0.17727	30.2	0.352	0.005	0.0015	18.3	91.3	0.005

110	52059.09	245	2174620.26	17012242.58	836.32	0.293	0.17051	30.2	0.339	0.004	0.00145	18.3	91.3	0.005
111	52059.09	250	2174625.26	17012242.71	836.32	0.282	0.16414	30.2	0.326	0.004	0.0014	18.3	91.3	0.004
112	52059.09	255	2174630.26	17012242.83	836.32	0.272	0.15813	30.2	0.314	0.004	0.00135	18.3	91.2	0.004
113	52059.09	260	2174635.26	17012242.96	836.32	0.262	0.15246	30.2	0.303	0.004	0.0013	18.3	91.2	0.004
114	52059.09	265	2174640.26	17012243.08	836.32	0.253	0.1471	30.2	0.293	0.004	0.00125	18.3	91.2	0.004
115	52059.09	270	2174645.26	17012243.21	836.32	0.244	0.14203	30.2	0.283	0.004	0.00121	18.3	91.2	0.004
116	52059.09	275	2174650.25	17012243.33	836.32	0.236	0.13723	30.2	0.273	0.004	0.00117	18.3	91.2	0.004
117	52059.09	280	2174655.25	17012243.46	836.32	0.228	0.13268	30.2	0.264	0.003	0.00113	18.3	91.1	0.004
118	52059.09	285	2174660.25	17012243.58	836.32	0.221	0.12836	30.2	0.255	0.003	0.00109	18.3	91.1	0.003
119	52059.09	290	2174665.25	17012243.7	836.32	0.214	0.12426	30.2	0.247	0.003	0.00106	18.2	91.1	0.003
120	52059.09	295	2174670.25	17012243.83	836.32	0.207	0.12036	30.1	0.24	0.003	0.00103	18.2	91.1	0.003
121	52059.09	300	2174675.25	17012243.95	836.32	0.201	0.11666	30.1	0.232	0.003	0.00099	18.2	91.1	0.003

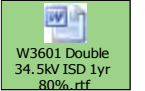
Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	169.65	-300	2150485.41	16931421.68	636.15	0.16	0.09813	31.6	0.187	0.003	0.00102	17.3	89	0.003
2	169.65	-295	2150490.23	16931420.34	636.15	0.164	0.10084	31.6	0.193	0.003	0.00105	17.3	89	0.004
3	169.65	-290	2150495.04	16931419	636.15	0.169	0.10368	31.6	0.198	0.003	0.00108	17.3	89	0.004
4	169.65	-285	2150499.86	16931417.66	636.15	0.174	0.10667	31.5	0.204	0.004	0.00111	17.3	89	0.004
5	169.65	-280	2150504.68	16931416.33	636.15	0.179	0.1098	31.5	0.21	0.004	0.00114	17.3	89	0.004
6	169.65	-275	2150509.49	16931414.99	636.15	0.184	0.1131	31.5	0.216	0.004	0.00117	17.3	89	0.004
7	169.65	-270	2150514.31	16931413.65	636.15	0.19	0.11656	31.5	0.223	0.004	0.00121	17.3	88.9	0.004
8	169.65	-265	2150519.13	16931412.31	636.15	0.196	0.12021	31.5	0.23	0.004	0.00125	17.3	88.9	0.004
9	169.65	-260	2150523.95	16931410.97	636.15	0.202	0.12405	31.5	0.237	0.004	0.00129	17.2	88.9	0.004
10	169.65	-255	2150528.76	16931409.63	636.15	0.209	0.12811	31.5	0.245	0.004	0.00132	17.2	88.9	0.004
11	169.65	-250	2150533.58	16931408.29	636.15	0.216	0.13239	31.5	0.253	0.004	0.00137	17.2	88.9	0.005
12	169.65	-245	2150538.4	16931406.95	636.15	0.223	0.13691	31.5	0.262	0.005	0.00141	17.2	88.9	0.005
13	169.65	-240	2150543.21	16931405.61	636.15	0.231	0.1417	31.5	0.271	0.005	0.00145	17.2	88.9	0.005
14	169.65	-235	2150548.03	16931404.27	636.15	0.239	0.14677	31.5	0.281	0.005	0.0015	17.1	88.9	0.005
15	169.65	-230	2150552.85	16931402.93	636.15	0.248	0.15214	31.5	0.291	0.005	0.00155	17.1	88.8	0.005
16	169.65	-225	2150557.67	16931401.59	636.15	0.257	0.15785	31.5	0.302	0.005	0.0016	17.1	88.8	0.005
17	169.65	-220	2150562.48	16931400.25	636.15	0.267	0.16391	31.5	0.313	0.005	0.00165	17	88.8	0.006
18	169.65	-215	2150567.3	16931398.91	636.15	0.277	0.17036	31.6	0.326	0.006	0.00171	17	88.8	0.006
19	169.65	-210	2150572.12	16931397.57	636.15	0.289	0.17723	31.6	0.339	0.006	0.00176	17	88.8	0.006
20	169.65	-205	2150576.94	16931396.23	636.15	0.3	0.18456	31.6	0.353	0.006	0.00182	16.9	88.8	0.006
21	169.65	-200	2150581.75	16931394.89	636.15	0.313	0.19239	31.6	0.367	0.006	0.00188	16.9	88.8	0.006
22	169.65	-195	2150586.57	16931393.55	636.15	0.326	0.20077	31.6	0.383	0.006	0.00194	16.8	88.8	0.007
23	169.65	-190	2150591.39	16931392.21	636.15	0.341	0.20974	31.6	0.4	0.007	0.00201	16.8	88.8	0.007
24	169.65	-185	2150596.2	16931390.88	636.15	0.356	0.21936	31.6	0.418	0.007	0.00207	16.7	88.8	0.007
25	169.65	-180	2150601.02	16931389.54	636.15	0.373	0.2297	31.6	0.438	0.007	0.00214	16.6	88.8	0.007
26	169.65	-175	2150605.84	16931388.2	636.15	0.391	0.24082	31.7	0.459	0.007	0.00221	16.6	88.8	0.008
27	169.65	-170	2150610.66	16931386.86	636.15	0.41	0.25282	31.7	0.481	0.008	0.00227	16.5	88.8	0.008
28	169.65	-165	2150615.47	16931385.52	636.15	0.43	0.26577	31.7	0.506	0.008	0.00234	16.4	88.8	0.008
29	169.65	-160	2150620.29	16931384.18	636.15	0.452	0.27978	31.7	0.532	0.008	0.00241	16.2	88.8	0.009
30	169.65	-155	2150625.11	16931382.84	636.15	0.476	0.29496	31.8	0.56	0.009	0.00247	16.1	88.8	0.009
31	169.65	-150	2150629.93	16931381.5	636.15	0.502	0.31145	31.8	0.591	0.009	0.00253	15.9	88.9	0.009
32	169.65	-145	2150634.74	16931380.16	636.15	0.531	0.32938	31.8	0.624	0.009	0.00258	15.8	88.9	0.01
33	169.65	-140	2150639.56	16931378.82	636.15	0.561	0.34893	31.9	0.661	0.009	0.00263	15.5	89	0.01
34	169.65	-135	2150644.38	16931377.48	636.15	0.594	0.37029	31.9	0.7	0.01	0.00266	15.3	89	0.01
35	169.65	-130	2150649.19	16931376.14	636.15	0.631	0.39367	32	0.743	0.01	0.00268	15	89.1	0.01
36	169.65	-125	2150654.01	16931374.8	636.15	0.67	0.41933	32	0.791	0.01	0.00268	14.6	89.2	0.011
37	169.65	-120	2150658.83	16931373.46	636.15	0.713	0.44754	32.1	0.842	0.011	0.00266	14.1	89.4	0.011
38	169.65	-115	2150663.65	16931372.12	636.15	0.761	0.47865	32.2	0.899	0.011	0.00259	13.6	89.5	0.011
39	169.65	-110	2150668.46	16931370.78	636.15	0.813	0.51301	32.3	0.961	0.011	0.00249	12.9	89.8	0.011
40	169.65	-105	2150673.28	16931369.44	636.15	0.87	0.55107	32.3	1.03	0.011	0.00232	12	90.1	0.011
41	169.65	-100	2150678.1	16931368.1	636.15	0.933	0.59331	32.4	1.106	0.011	0.00208	10.8	90.4	0.011
42	169.65	-95	2150682.92	16931366.77	636.15	1.003	0.64031	32.6	1.19	0.011	0.00175	9.2	90.9	0.011
43	169.65	-90	2150687.73	16931365.43	636.15	1.08	0.69272	32.7	1.283	0.01	0.0013	7.1	91.6	0.011
44	169.65	-85	2150692.55	16931364.09	636.15	1.165	0.75127	32.8	1.386	0.01	0.00077	4.4	92.5	0.01
45	169.65	-80	2150697.37	16931362.75	636.15	1.259	0.81681	33	1.501	0.009	0.00063	4	93.7	0.009
46	169.65	-75	2150702.18	16931361.41	636.15	1.363	0.89028	33.2	1.628	0.008	0.00155	11	95	0.008
47	169.65	-70	2150707	16931360.07	636.15	1.478	0.9727	33.3	1.77	0.006	0.00299	25	95.4	0.007
48	169.65	-65	2150711.82	16931358.73	636.15	1.606	1.06521	33.6	1.927	0.004	0.0049	48.2	90	0.006
49	169.65	-60	2150716.64	16931357.39	636.15	1.747	1.16895	33.8	2.102	0.002	0.00738	72.5	78.8	0.007
50	169.65	-55	2150721.45	16931356.05	636.15	1.902	1.28507	34	2.295	0.003	0.01057	71.8	75.5	0.011
51	169.65	-50	2150726.27	16931354.71	636.15	2.072	1.41456	34.3	2.509	0.008	0.01462	62.2	76.5	0.016
52	169.65	-45	2150731.09	16931353.37	636.15	2.256	1.55806	34.6	2.742	0.013	0.01971	55.8	78	0.024



53	169.65	-40	2150735.9	16931352.03	636.15	2.455	1.71563	35	2.995	0.02	0.02599	52	79.4	0.033
54	169.65	-35	2150740.72	16931350.69	636.15	2.665	1.88629	35.3	3.265	0.029	0.0336	49.6	80.5	0.044
55	169.65	-30	2150745.54	16931349.35	636.15	2.884	2.06753	35.6	3.548	0.038	0.04256	48.1	81.6	0.057
56	169.65	-25	2150750.36	16931348.01	636.15	3.105	2.25478	36	3.837	0.049	0.05275	47.3	82.7	0.072
57	169.65	-20	2150755.17	16931346.67	636.15	3.32	2.44082	36.3	4.121	0.06	0.06378	46.9	83.8	0.087
58	169.65	-15	2150759.99	16931345.33	636.15	3.519	2.61568	36.6	4.384	0.071	0.07495	46.7	84.9	0.103
59	169.65	-10	2150764.81	16931343.99	636.15	3.688	2.76705	36.9	4.611	0.08	0.08523	46.7	86.2	0.117
60	169.65	-5	2150769.63	16931342.65	636.15	3.815	2.88176	37.1	4.781	0.088	0.09342	46.7	87.6	0.128
61	169.65	0	2150774.44	16931341.32	636.15	3.887	2.94811	37.2	4.879	0.092	0.09835	46.8	89	0.135
62	169.65	5	2150779.26	16931339.98	636.15	3.899	2.9586	37.2	4.894	0.093	0.09926	46.8	90.4	0.136
63	169.65	10	2150784.08	16931338.64	636.15	3.848	2.91197	37.1	4.826	0.09	0.09599	46.8	91.9	0.132
64	169.65	15	2150788.89	16931337.3	636.15	3.74	2.81353	37	4.68	0.084	0.08909	46.8	93.2	0.122
65	169.65	20	2150793.71	16931335.96	636.15	3.585	2.67371	36.7	4.472	0.075	0.07959	46.8	94.5	0.109
66	169.65	25	2150798.53	16931334.62	636.15	3.395	2.50548	36.4	4.219	0.064	0.06871	47	95.7	0.094
67	169.65	30	2150803.35	16931333.28	636.15	3.184	2.32172	36.1	3.94	0.053	0.05758	47.4	96.8	0.078
68	169.65	35	2150808.16	16931331.94	636.15	2.963	2.1334	35.8	3.651	0.042	0.04702	48.1	97.9	0.063
69	169.65	40	2150812.98	16931330.6	636.15	2.742	1.94879	35.4	3.364	0.032	0.03755	49.3	98.9	0.05
70	169.65	45	2150817.8	16931329.26	636.15	2.528	1.77342	35.1	3.088	0.024	0.02939	51.3	100	0.038
71	169.65	50	2150822.62	16931327.92	636.15	2.324	1.61049	34.7	2.827	0.016	0.02257	54.6	101.2	0.028
72	169.65	55	2150827.43	16931326.58	636.15	2.134	1.46149	34.4	2.586	0.01	0.01701	59.9	102.6	0.02
73	169.65	60	2150832.25	16931325.24	636.15	1.958	1.32669	34.1	2.365	0.005	0.01254	68.2	103.8	0.013
74	169.65	65	2150837.07	16931323.9	636.15	1.797	1.2056	33.9	2.164	0.002	0.00899	76.5	103	0.009
75	169.65	70	2150841.88	16931322.56	636.15	1.651	1.09734	33.6	1.983	0.003	0.00622	61.3	95.5	0.007
76	169.65	75	2150846.7	16931321.22	636.15	1.519	1.00078	33.4	1.819	0.006	0.00406	36.3	86.7	0.007
77	169.65	80	2150851.52	16931319.88	636.15	1.399	0.91477	33.2	1.671	0.007	0.0024	18.3	85	0.008
78	169.65	85	2150856.34	16931318.54	636.15	1.29	0.83814	33	1.539	0.009	0.00118	7.8	86	0.009
79	169.65	90	2150861.15	16931317.2	636.15	1.193	0.76984	32.8	1.42	0.01	0.00051	3.1	87.1	0.01
80	169.65	95	2150865.97	16931315.87	636.15	1.104	0.70888	32.7	1.312	0.01	0.00084	4.7	88.1	0.01
81	169.65	100	2150870.79	16931314.53	636.15	1.025	0.65437	32.6	1.216	0.011	0.00133	7.2	88.8	0.011
82	169.65	105	2150875.6	16931313.19	636.15	0.953	0.60554	32.4	1.129	0.011	0.00172	9.1	89.4	0.011
83	169.65	110	2150880.42	16931311.85	636.15	0.887	0.5617	32.3	1.05	0.011	0.00201	10.5	89.8	0.011
84	169.65	115	2150885.24	16931310.51	636.15	0.828	0.52225	32.2	0.979	0.011	0.00221	11.6	90.1	0.011
85	169.65	120	2150890.06	16931309.17	636.15	0.774	0.48668	32.2	0.914	0.011	0.00236	12.4	90.4	0.011
86	169.65	125	2150894.87	16931307.83	636.15	0.725	0.45452	32.1	0.856	0.01	0.00245	13.1	90.6	0.011
87	169.65	130	2150899.69	16931306.49	636.15	0.681	0.42538	32	0.803	0.01	0.0025	13.7	90.7	0.011
88	169.65	135	2150904.51	16931305.15	636.15	0.64	0.39891	31.9	0.754	0.01	0.00252	14.1	90.8	0.01
89	169.65	140	2150909.33	16931303.81	636.15	0.603	0.37482	31.9	0.71	0.01	0.00252	14.5	90.9	0.01
90	169.65	145	2150914.14	16931302.47	636.15	0.568	0.35283	31.8	0.669	0.009	0.00249	14.8	91	0.01
91	169.65	150	2150918.96	16931301.13	636.15	0.537	0.33273	31.8	0.632	0.009	0.00246	15	91.1	0.009
92	169.65	155	2150923.78	16931299.79	636.15	0.508	0.31432	31.7	0.597	0.009	0.00242	15.3	91.1	0.009
93	169.65	160	2150928.59	16931298.45	636.15	0.481	0.2974	31.7	0.566	0.009	0.00237	15.4	91.2	0.009
94	169.65	165	2150933.41	16931297.11	636.15	0.457	0.28184	31.7	0.537	0.008	0.00231	15.6	91.2	0.009
95	169.65	170	2150938.23	16931295.77	636.15	0.434	0.2675	31.6	0.51	0.008	0.00225	15.7	91.2	0.008
96	169.65	175	2150943.05	16931294.43	636.15	0.413	0.25425	31.6	0.485	0.008	0.00219	15.9	91.2	0.008
97	169.65	180	2150947.86	16931293.09	636.15	0.394	0.242	31.6	0.462	0.007	0.00213	16	91.2	0.008
98	169.65	185	2150952.68	16931291.76	636.15	0.375	0.23064	31.6	0.441	0.007	0.00206	16.1	91.2	0.007
99	169.65	190	2150957.5	16931290.42	636.15	0.358	0.22009	31.5	0.421	0.007	0.002	16.2	91.2	0.007
100	169.65	195	2150962.32	16931289.08	636.15	0.343	0.21029	31.5	0.402	0.007	0.00194	16.2	91.2	0.007
101	169.65	200	2150967.13	16931287.74	636.15	0.328	0.20115	31.5	0.385	0.006	0.00188	16.3	91.2	0.007
102	169.65	205	2150971.95	16931286.4	636.15	0.314	0.19263	31.5	0.369	0.006	0.00182	16.4	91.2	0.006
103	169.65	210	2150976.77	16931285.06	636.15	0.301	0.18467	31.5	0.354	0.006	0.00176	16.4	91.2	0.006
104	169.65	215	2150981.58	16931283.72	636.15	0.289	0.17723	31.5	0.339	0.006	0.00171	16.5	91.2	0.006
105	169.65	220	2150986.4	16931282.38	636.15	0.278	0.17025	31.5	0.326	0.006	0.00165	16.5	91.2	0.006

106	169.65	225	2150991.22	16931281.04	636.15	0.268	0.16371	31.5	0.314	0.005	0.0016	16.5	91.2	0.006
107	169.65	230	2150996.04	16931279.7	636.15	0.258	0.15757	31.5	0.302	0.005	0.00155	16.6	91.2	0.005
108	169.65	235	2151000.85	16931278.36	636.15	0.248	0.15179	31.4	0.291	0.005	0.0015	16.6	91.2	0.005
109	169.65	240	2151005.67	16931277.02	636.15	0.239	0.14635	31.4	0.281	0.005	0.00145	16.6	91.1	0.005
110	169.65	245	2151010.49	16931275.68	636.15	0.231	0.14123	31.4	0.271	0.005	0.00141	16.7	91.1	0.005
111	169.65	250	2151015.3	16931274.34	636.15	0.223	0.13639	31.4	0.262	0.005	0.00136	16.7	91.1	0.005
112	169.65	255	2151020.12	16931273	636.15	0.216	0.13182	31.4	0.253	0.004	0.00132	16.7	91.1	0.005
113	169.65	260	2151024.94	16931271.66	636.15	0.209	0.1275	31.4	0.244	0.004	0.00128	16.7	91.1	0.004
114	169.65	265	2151029.76	16931270.32	636.15	0.202	0.12341	31.4	0.237	0.004	0.00124	16.8	91.1	0.004
115	169.65	270	2151034.57	16931268.98	636.15	0.196	0.11954	31.4	0.229	0.004	0.0012	16.8	91.1	0.004
116	169.65	275	2151039.39	16931267.64	636.15	0.19	0.11586	31.4	0.222	0.004	0.00117	16.8	91.1	0.004
117	169.65	280	2151044.21	16931266.31	636.15	0.184	0.11237	31.4	0.215	0.004	0.00113	16.8	91.1	0.004
118	169.65	285	2151049.03	16931264.97	636.15	0.178	0.10906	31.4	0.209	0.004	0.0011	16.8	91	0.004
119	169.65	290	2151053.84	16931263.63	636.15	0.173	0.10591	31.4	0.203	0.004	0.00107	16.8	91	0.004
120	169.65	295	2151058.66	16931262.29	636.15	0.168	0.10291	31.4	0.197	0.003	0.00104	16.9	91	0.004
121	169.65	300	2151063.48	16931260.95	636.15	0.164	0.10005	31.4	0.192	0.003	0.00101	16.9	91	0.003

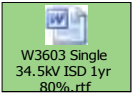
Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	37864.36	-300	2158063.64	16961510.89	931.31	0.178	0.10333	30.1	0.206	0.004	0.00105	13.8	88.9	0.004
2	37864.36	-295	2158068.64	16961510.9	931.31	0.184	0.10683	30.1	0.213	0.004	0.00109	13.8	88.9	0.005
3	37864.36	-290	2158073.64	16961510.92	931.31	0.191	0.11051	30.1	0.22	0.005	0.00112	13.8	88.9	0.005
4	37864.36	-285	2158078.64	16961510.93	931.31	0.197	0.11438	30.1	0.228	0.005	0.00116	13.8	88.9	0.005
5	37864.36	-280	2158083.64	16961510.94	931.31	0.204	0.11846	30.1	0.236	0.005	0.0012	13.8	88.8	0.005
6	37864.36	-275	2158088.64	16961510.96	931.31	0.212	0.12275	30.1	0.245	0.005	0.00124	13.7	88.8	0.005
7	37864.36	-270	2158093.64	16961510.97	931.31	0.219	0.12729	30.1	0.254	0.005	0.00128	13.7	88.8	0.005
8	37864.36	-265	2158098.64	16961510.98	931.31	0.228	0.13208	30.1	0.263	0.005	0.00133	13.7	88.8	0.006
9	37864.36	-260	2158103.64	16961510.99	931.31	0.236	0.13715	30.1	0.273	0.006	0.00137	13.7	88.8	0.006
10	37864.36	-255	2158108.64	16961511.01	931.31	0.246	0.14251	30.1	0.284	0.006	0.00142	13.7	88.7	0.006
11	37864.36	-250	2158113.64	16961511.02	931.31	0.255	0.14819	30.1	0.295	0.006	0.00148	13.7	88.7	0.006
12	37864.36	-245	2158118.64	16961511.03	931.31	0.266	0.15421	30.1	0.307	0.006	0.00153	13.7	88.7	0.006
13	37864.36	-240	2158123.64	16961511.05	931.31	0.277	0.16061	30.1	0.32	0.007	0.00159	13.7	88.7	0.007
14	37864.36	-235	2158128.64	16961511.06	931.31	0.288	0.16741	30.1	0.333	0.007	0.00165	13.7	88.7	0.007
15	37864.36	-230	2158133.64	16961511.07	931.31	0.301	0.17465	30.2	0.348	0.007	0.00171	13.7	88.6	0.007
16	37864.36	-225	2158138.64	16961511.08	931.31	0.314	0.18237	30.2	0.363	0.007	0.00178	13.6	88.6	0.008
17	37864.36	-220	2158143.64	16961511.1	931.31	0.328	0.19061	30.2	0.379	0.008	0.00186	13.6	88.6	0.008
18	37864.36	-215	2158148.64	16961511.11	931.31	0.343	0.19942	30.2	0.397	0.008	0.00193	13.6	88.6	0.008
19	37864.36	-210	2158153.64	16961511.12	931.31	0.359	0.20884	30.2	0.415	0.008	0.00201	13.6	88.5	0.009
20	37864.36	-205	2158158.64	16961511.14	931.31	0.376	0.21895	30.2	0.435	0.009	0.0021	13.6	88.5	0.009
21	37864.36	-200	2158163.64	16961511.15	931.31	0.395	0.2298	30.2	0.457	0.009	0.00219	13.6	88.5	0.009
22	37864.36	-195	2158168.64	16961511.16	931.31	0.415	0.24148	30.2	0.48	0.01	0.00229	13.5	88.4	0.01
23	37864.36	-190	2158173.64	16961511.17	931.31	0.436	0.25406	30.2	0.505	0.01	0.00239	13.5	88.4	0.01
24	37864.36	-185	2158178.64	16961511.19	931.31	0.459	0.26763	30.2	0.531	0.01	0.0025	13.5	88.4	0.011
25	37864.36	-180	2158183.64	16961511.2	931.31	0.484	0.28232	30.2	0.56	0.011	0.00262	13.5	88.4	0.011
26	37864.36	-175	2158188.64	16961511.21	931.31	0.511	0.29824	30.3	0.592	0.011	0.00274	13.4	88.3	0.012
27	37864.36	-170	2158193.64	16961511.23	931.31	0.54	0.31553	30.3	0.626	0.012	0.00287	13.4	88.3	0.012
28	37864.36	-165	2158198.64	16961511.24	931.31	0.572	0.33435	30.3	0.663	0.013	0.00301	13.3	88.3	0.013
29	37864.36	-160	2158203.64	16961511.25	931.31	0.607	0.35489	30.3	0.703	0.013	0.00315	13.3	88.2	0.014
30	37864.36	-155	2158208.64	16961511.26	931.31	0.645	0.37736	30.3	0.747	0.014	0.00331	13.2	88.2	0.014
31	37864.36	-150	2158213.64	16961511.28	931.31	0.686	0.40199	30.4	0.796	0.015	0.00348	13.2	88.2	0.015
32	37864.36	-145	2158218.64	16961511.29	931.31	0.732	0.42909	30.4	0.849	0.016	0.00365	13.1	88.1	0.016
33	37864.36	-140	2158223.64	16961511.3	931.31	0.782	0.45898	30.4	0.907	0.017	0.00383	13	88.1	0.017
34	37864.36	-135	2158228.64	16961511.32	931.31	0.838	0.49205	30.4	0.971	0.017	0.00403	13	88.1	0.018
35	37864.36	-130	2158233.64	16961511.33	931.31	0.899	0.52877	30.5	1.043	0.019	0.00423	12.9	88.1	0.019
36	37864.36	-125	2158238.64	16961511.34	931.31	0.967	0.56966	30.5	1.122	0.02	0.00444	12.7	88	0.02
37	37864.36	-120	2158243.64	16961511.35	931.31	1.043	0.61539	30.5	1.211	0.021	0.00465	12.6	88	0.021
38	37864.36	-115	2158248.64	16961511.37	931.31	1.128	0.66672	30.6	1.311	0.022	0.00486	12.4	88	0.023
39	37864.36	-110	2158253.64	16961511.38	931.31	1.224	0.72459	30.6	1.422	0.023	0.00507	12.2	88	0.024
40	37864.36	-105	2158258.64	16961511.39	931.31	1.331	0.79011	30.7	1.548	0.025	0.00526	12	88.1	0.025
41	37864.36	-100	2158263.64	16961511.41	931.31	1.453	0.86465	30.8	1.691	0.026	0.00543	11.7	88.1	0.027
42	37864.36	-95	2158268.64	16961511.42	931.31	1.592	0.94988	30.8	1.854	0.028	0.00555	11.3	88.2	0.028
43	37864.36	-90	2158273.64	16961511.43	931.31	1.75	1.04785	30.9	2.04	0.029	0.0056	10.9	88.3	0.03
44	37864.36	-85	2158278.64	16961511.44	931.31	1.932	1.16111	31	2.254	0.031	0.00554	10.2	88.5	0.031
45	37864.36	-80	2158283.64	16961511.46	931.31	2.142	1.29283	31.1	2.502	0.032	0.00532	9.4	88.8	0.032
46	37864.36	-75	2158288.64	16961511.47	931.31	2.386	1.44697	31.2	2.79	0.033	0.00485	8.3	89.2	0.033
47	37864.36	-70	2158293.64	16961511.48	931.31	2.669	1.62851	31.4	3.127	0.034	0.00402	6.8	89.8	0.034
48	37864.36	-65	2158298.64	16961511.5	931.31	3.001	1.84375	31.6	3.523	0.034	0.00275	4.6	90.6	0.034
49	37864.36	-60	2158303.64	16961511.51	931.31	3.392	2.10059	31.8	3.99	0.033	0.00177	3.1	91.9	0.033
50	37864.36	-55	2158308.64	16961511.52	931.31	3.854	2.40896	32	4.545	0.03	0.00433	8.1	93.8	0.03
51	37864.36	-50	2158313.64	16961511.54	931.31	4.4	2.78112	32.3	5.205	0.025	0.0098	21.1	95.6	0.027
52	37864.36	-45	2158318.64	16961511.55	931.31	5.046	3.23183	32.6	5.993	0.018	0.01833	46.1	90.2	0.024
53	37864.36	-40	2158323.64	16961511.56	931.31	5.81	3.77783	33	6.93	0.011	0.0312	71.3	72.3	0.031
54	37864.36	-35	2158328.64	16961511.57	931.31	6.703	4.436	33.5	8.038	0.023	0.05023	65	70.3	0.055



55	37864.36	-30	2158333.64	16961511.59	931.31	7.732	5.21856	34	9.329	0.052	0.07763	56.3	72.8	0.093
56	37864.36	-25	2158338.64	16961511.6	931.31	8.883	6.12343	34.6	10.789	0.091	0.11551	51.6	75.4	0.147
57	37864.36	-20	2158343.64	16961511.61	931.31	10.107	7.11851	35.2	12.362	0.141	0.16455	49.4	78	0.217
58	37864.36	-15	2158348.64	16961511.63	931.31	11.309	8.12407	35.7	13.925	0.197	0.22173	48.4	80.6	0.296
59	37864.36	-10	2158353.64	16961511.64	931.31	12.344	9.00874	36.1	15.282	0.25	0.27839	48.1	83.5	0.374
60	37864.36	-5	2158358.64	16961511.65	931.31	13.051	9.61918	36.4	16.213	0.289	0.32108	48	86.7	0.432
61	37864.36	0	2158363.64	16961511.66	931.31	13.301	9.83666	36.5	16.543	0.303	0.33705	48	90	0.453
62	37864.36	5	2158368.64	16961511.68	931.31	13.05	9.61833	36.4	16.211	0.289	0.32106	48	93.3	0.432
63	37864.36	10	2158373.64	16961511.69	931.31	12.343	9.00739	36.1	15.28	0.25	0.27837	48.1	96.5	0.374
64	37864.36	15	2158378.64	16961511.7	931.31	11.307	8.12265	35.7	13.922	0.197	0.22172	48.4	99.4	0.296
65	37864.36	20	2158383.64	16961511.72	931.31	10.105	7.11727	35.2	12.36	0.141	0.16455	49.4	102	0.217
66	37864.36	25	2158388.64	16961511.73	931.31	8.882	6.12247	34.6	10.787	0.091	0.11552	51.6	104.6	0.147
67	37864.36	30	2158393.64	16961511.74	931.31	7.732	5.21786	34	9.328	0.052	0.07764	56.3	107.2	0.093
68	37864.36	35	2158398.64	16961511.75	931.31	6.703	4.4355	33.5	8.037	0.023	0.05025	65	109.7	0.055
69	37864.36	40	2158403.64	16961511.77	931.31	5.809	3.77748	33	6.929	0.011	0.03122	71.3	107.7	0.031
70	37864.36	45	2158408.64	16961511.78	931.31	5.046	3.23158	32.6	5.992	0.018	0.01835	46.1	89.8	0.024
71	37864.36	50	2158413.64	16961511.79	931.31	4.399	2.78095	32.3	5.205	0.025	0.00981	21.2	84.4	0.027
72	37864.36	55	2158418.64	16961511.81	931.31	3.853	2.40884	32	4.544	0.03	0.00434	8.2	86.2	0.03
73	37864.36	60	2158423.64	16961511.82	931.31	3.392	2.1005	31.8	3.99	0.033	0.00177	3.1	88.1	0.033
74	37864.36	65	2158428.64	16961511.83	931.31	3.001	1.84369	31.6	3.522	0.034	0.00274	4.6	89.4	0.034
75	37864.36	70	2158433.64	16961511.84	931.31	2.669	1.62847	31.4	3.127	0.034	0.00401	6.8	90.2	0.034
76	37864.36	75	2158438.64	16961511.86	931.31	2.386	1.44693	31.2	2.79	0.033	0.00484	8.3	90.8	0.033
77	37864.36	80	2158443.64	16961511.87	931.31	2.142	1.2928	31.1	2.502	0.032	0.00531	9.4	91.2	0.032
78	37864.36	85	2158448.64	16961511.88	931.31	1.932	1.16109	31	2.254	0.031	0.00554	10.2	91.5	0.031
79	37864.36	90	2158453.64	16961511.9	931.31	1.75	1.04783	30.9	2.04	0.029	0.0056	10.9	91.7	0.03
80	37864.36	95	2158458.64	16961511.91	931.31	1.592	0.94986	30.8	1.854	0.028	0.00555	11.3	91.8	0.028
81	37864.36	100	2158463.64	16961511.92	931.31	1.453	0.86464	30.8	1.691	0.026	0.00542	11.7	91.9	0.027
82	37864.36	105	2158468.64	16961511.93	931.31	1.331	0.7901	30.7	1.548	0.025	0.00526	12	91.9	0.025
83	37864.36	110	2158473.64	16961511.95	931.31	1.224	0.72458	30.6	1.422	0.023	0.00506	12.2	92	0.024
84	37864.36	115	2158478.64	16961511.96	931.31	1.128	0.66672	30.6	1.31	0.022	0.00486	12.4	92	0.023
85	37864.36	120	2158483.64	16961511.97	931.31	1.043	0.61539	30.5	1.211	0.021	0.00465	12.6	92	0.021
86	37864.36	125	2158488.64	16961511.99	931.31	0.967	0.56966	30.5	1.122	0.02	0.00443	12.7	92	0.02
87	37864.36	130	2158493.64	16961512	931.31	0.899	0.52876	30.5	1.043	0.019	0.00423	12.9	91.9	0.019
88	37864.36	135	2158498.64	16961512.01	931.31	0.838	0.49205	30.4	0.971	0.017	0.00403	13	91.9	0.018
89	37864.36	140	2158503.64	16961512.02	931.31	0.782	0.45898	30.4	0.907	0.017	0.00383	13	91.9	0.017
90	37864.36	145	2158508.64	16961512.04	931.31	0.732	0.42909	30.4	0.849	0.016	0.00365	13.1	91.9	0.016
91	37864.36	150	2158513.64	16961512.05	931.31	0.686	0.40199	30.4	0.796	0.015	0.00348	13.2	91.8	0.015
92	37864.36	155	2158518.64	16961512.06	931.31	0.645	0.37735	30.3	0.747	0.014	0.00331	13.2	91.8	0.014
93	37864.36	160	2158523.64	16961512.08	931.31	0.607	0.35489	30.3	0.703	0.013	0.00315	13.3	91.8	0.014
94	37864.36	165	2158528.64	16961512.09	931.31	0.572	0.33435	30.3	0.663	0.013	0.00301	13.3	91.7	0.013
95	37864.36	170	2158533.64	16961512.1	931.31	0.54	0.31553	30.3	0.626	0.012	0.00287	13.4	91.7	0.012
96	37864.36	175	2158538.64	16961512.11	931.31	0.511	0.29824	30.3	0.592	0.011	0.00274	13.4	91.7	0.012
97	37864.36	180	2158543.64	16961512.13	931.31	0.484	0.28232	30.2	0.56	0.011	0.00261	13.5	91.6	0.011
98	37864.36	185	2158548.64	16961512.14	931.31	0.459	0.26763	30.2	0.531	0.01	0.0025	13.5	91.6	0.011
99	37864.36	190	2158553.64	16961512.15	931.31	0.436	0.25405	30.2	0.505	0.01	0.00239	13.5	91.6	0.01
100	37864.36	195	2158558.64	16961512.17	931.31	0.415	0.24148	30.2	0.48	0.01	0.00229	13.5	91.6	0.01
101	37864.36	200	2158563.64	16961512.18	931.31	0.395	0.2298	30.2	0.457	0.009	0.00219	13.6	91.5	0.009
102	37864.36	205	2158568.64	16961512.19	931.31	0.376	0.21895	30.2	0.435	0.009	0.0021	13.6	91.5	0.009
103	37864.36	210	2158573.64	16961512.2	931.31	0.359	0.20884	30.2	0.415	0.008	0.00201	13.6	91.5	0.009
104	37864.36	215	2158578.64	16961512.22	931.31	0.343	0.19942	30.2	0.397	0.008	0.00193	13.6	91.4	0.008
105	37864.36	220	2158583.64	16961512.23	931.31	0.328	0.19061	30.2	0.379	0.008	0.00186	13.6	91.4	0.008
106	37864.36	225	2158588.64	16961512.24	931.31	0.314	0.18237	30.2	0.363	0.007	0.00178	13.6	91.4	0.008
107	37864.36	230	2158593.64	16961512.26	931.31	0.301	0.17465	30.2	0.348	0.007	0.00171	13.7	91.4	0.007
108	37864.36	235	2158598.64	16961512.27	931.31	0.288	0.16741	30.1	0.333	0.007	0.00165	13.7	91.3	0.007
109	37864.36	240	2158603.64	16961512.28	931.31	0.277	0.16061	30.1	0.32	0.007	0.00159	13.7	91.3	0.007

110	37864.36	245	2158608.64	16961512.29	931.31	0.266	0.15421	30.1	0.307	0.006	0.00153	13.7	91.3	0.006
111	37864.36	250	2158613.64	16961512.31	931.31	0.255	0.14819	30.1	0.295	0.006	0.00148	13.7	91.3	0.006
112	37864.36	255	2158618.64	16961512.32	931.31	0.246	0.14251	30.1	0.284	0.006	0.00142	13.7	91.3	0.006
113	37864.36	260	2158623.64	16961512.33	931.31	0.236	0.13715	30.1	0.273	0.006	0.00137	13.7	91.2	0.006
114	37864.36	265	2158628.64	16961512.35	931.31	0.228	0.13208	30.1	0.263	0.005	0.00133	13.7	91.2	0.006
115	37864.36	270	2158633.64	16961512.36	931.31	0.219	0.12729	30.1	0.254	0.005	0.00128	13.7	91.2	0.005
116	37864.36	275	2158638.64	16961512.37	931.31	0.212	0.12275	30.1	0.245	0.005	0.00124	13.7	91.2	0.005
117	37864.36	280	2158643.64	16961512.38	931.31	0.204	0.11846	30.1	0.236	0.005	0.0012	13.8	91.2	0.005
118	37864.36	285	2158648.64	16961512.4	931.31	0.197	0.11438	30.1	0.228	0.005	0.00116	13.8	91.1	0.005
119	37864.36	290	2158653.64	16961512.41	931.31	0.191	0.11051	30.1	0.22	0.005	0.00112	13.8	91.1	0.005
120	37864.36	295	2158658.64	16961512.42	931.31	0.184	0.10683	30.1	0.213	0.004	0.00109	13.8	91.1	0.005
121	37864.36	300	2158663.64	16961512.44	931.31	0.178	0.10333	30.1	0.206	0.004	0.00105	13.8	91.1	0.004

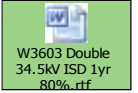
Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	50304.52	-300	2174877.09	17012818.16	884.9	0.127	0.07113	29.2	0.146	0.003	0.00084	17.4	88.9	0.003
2	50304.52	-295	2174880.12	17012814.18	884.9	0.132	0.07345	29.2	0.151	0.003	0.00087	17.4	88.9	0.003
3	50304.52	-290	2174883.16	17012810.2	884.9	0.136	0.07589	29.2	0.156	0.003	0.0009	17.3	88.9	0.003
4	50304.52	-285	2174886.19	17012806.23	884.9	0.14	0.07845	29.2	0.161	0.003	0.00093	17.3	88.9	0.003
5	50304.52	-280	2174889.22	17012802.25	884.9	0.145	0.08115	29.2	0.166	0.003	0.00096	17.3	88.8	0.003
6	50304.52	-275	2174892.25	17012798.27	884.9	0.15	0.084	29.2	0.172	0.003	0.00099	17.3	88.8	0.003
7	50304.52	-270	2174895.28	17012794.3	884.9	0.155	0.087	29.2	0.178	0.003	0.00103	17.3	88.8	0.003
8	50304.52	-265	2174898.31	17012790.32	884.9	0.161	0.09017	29.3	0.185	0.003	0.00106	17.3	88.8	0.004
9	50304.52	-260	2174901.34	17012786.34	884.9	0.167	0.09352	29.3	0.191	0.004	0.0011	17.3	88.8	0.004
10	50304.52	-255	2174904.37	17012782.37	884.9	0.173	0.09706	29.3	0.198	0.004	0.00114	17.3	88.8	0.004
11	50304.52	-250	2174907.4	17012778.39	884.9	0.18	0.10081	29.3	0.206	0.004	0.00118	17.3	88.7	0.004
12	50304.52	-245	2174910.43	17012774.41	884.9	0.187	0.10479	29.3	0.214	0.004	0.00123	17.3	88.7	0.004
13	50304.52	-240	2174913.47	17012770.44	884.9	0.194	0.10901	29.3	0.223	0.004	0.00127	17.3	88.7	0.004
14	50304.52	-235	2174916.5	17012766.46	884.9	0.202	0.11349	29.3	0.232	0.004	0.00132	17.3	88.7	0.004
15	50304.52	-230	2174919.53	17012762.48	884.9	0.21	0.11826	29.4	0.241	0.004	0.00138	17.3	88.6	0.005
16	50304.52	-225	2174922.56	17012758.51	884.9	0.219	0.12334	29.4	0.251	0.005	0.00143	17.3	88.6	0.005
17	50304.52	-220	2174925.59	17012754.53	884.9	0.229	0.12876	29.4	0.262	0.005	0.00149	17.3	88.6	0.005
18	50304.52	-215	2174928.62	17012750.55	884.9	0.239	0.13455	29.4	0.274	0.005	0.00155	17.3	88.6	0.005
19	50304.52	-210	2174931.65	17012746.58	884.9	0.25	0.14075	29.4	0.287	0.005	0.00162	17.3	88.5	0.005
20	50304.52	-205	2174934.68	17012742.6	884.9	0.261	0.14738	29.4	0.3	0.005	0.00169	17.3	88.5	0.006
21	50304.52	-200	2174937.71	17012738.62	884.9	0.274	0.1545	29.5	0.314	0.006	0.00176	17.3	88.5	0.006
22	50304.52	-195	2174940.74	17012734.65	884.9	0.287	0.16215	29.5	0.33	0.006	0.00184	17.3	88.5	0.006
23	50304.52	-190	2174943.77	17012730.67	884.9	0.301	0.17039	29.5	0.346	0.006	0.00193	17.3	88.4	0.006
24	50304.52	-185	2174946.81	17012726.69	884.9	0.317	0.17928	29.5	0.364	0.006	0.00202	17.3	88.4	0.007
25	50304.52	-180	2174949.84	17012722.72	884.9	0.333	0.18888	29.5	0.383	0.007	0.00212	17.3	88.4	0.007
26	50304.52	-175	2174952.87	17012718.74	884.9	0.351	0.19928	29.6	0.404	0.007	0.00222	17.2	88.3	0.007
27	50304.52	-170	2174955.9	17012714.76	884.9	0.371	0.21056	29.6	0.427	0.008	0.00233	17.2	88.3	0.008
28	50304.52	-165	2174958.93	17012710.79	884.9	0.392	0.22283	29.6	0.451	0.008	0.00245	17.2	88.3	0.008
29	50304.52	-160	2174961.96	17012706.81	884.9	0.415	0.2362	29.6	0.478	0.008	0.00257	17.2	88.2	0.009
30	50304.52	-155	2174964.99	17012702.83	884.9	0.44	0.2508	29.7	0.507	0.009	0.00271	17.2	88.2	0.009
31	50304.52	-150	2174968.02	17012698.86	884.9	0.468	0.2668	29.7	0.539	0.009	0.00285	17.2	88.2	0.01
32	50304.52	-145	2174971.05	17012694.88	884.9	0.498	0.28438	29.7	0.574	0.01	0.00301	17.2	88.1	0.01
33	50304.52	-140	2174974.08	17012690.9	884.9	0.531	0.30374	29.8	0.612	0.01	0.00317	17.1	88.1	0.011
34	50304.52	-135	2174977.12	17012686.93	884.9	0.568	0.32513	29.8	0.654	0.011	0.00335	17.1	88.1	0.011
35	50304.52	-130	2174980.15	17012682.95	884.9	0.608	0.34884	29.8	0.701	0.012	0.00353	17.1	88	0.012
36	50304.52	-125	2174983.18	17012678.97	884.9	0.653	0.3752	29.9	0.753	0.012	0.00373	17	88	0.013
37	50304.52	-120	2174986.21	17012675	884.9	0.703	0.40464	29.9	0.811	0.013	0.00395	17	88	0.014
38	50304.52	-115	2174989.24	17012671.02	884.9	0.759	0.43762	30	0.876	0.014	0.00417	16.9	88	0.014
39	50304.52	-110	2174992.27	17012667.05	884.9	0.821	0.47472	30	0.949	0.015	0.0044	16.9	88	0.015
40	50304.52	-105	2174995.3	17012663.07	884.9	0.892	0.51666	30.1	1.03	0.015	0.00465	16.8	88	0.016
41	50304.52	-100	2174998.33	17012659.09	884.9	0.971	0.56426	30.2	1.123	0.016	0.00489	16.7	88	0.017
42	50304.52	-95	2175001.36	17012655.12	884.9	1.061	0.61858	30.2	1.228	0.017	0.00514	16.5	88.1	0.018
43	50304.52	-90	2175004.39	17012651.14	884.9	1.164	0.68087	30.3	1.348	0.018	0.00537	16.3	88.2	0.019
44	50304.52	-85	2175007.43	17012647.16	884.9	1.281	0.75273	30.4	1.486	0.019	0.00557	16.1	88.3	0.02
45	50304.52	-80	2175010.46	17012643.19	884.9	1.416	0.8361	30.6	1.645	0.02	0.00573	15.8	88.5	0.021
46	50304.52	-75	2175013.49	17012639.21	884.9	1.573	0.93345	30.7	1.829	0.021	0.00579	15.3	88.8	0.022
47	50304.52	-70	2175016.52	17012635.23	884.9	1.754	1.04787	30.9	2.043	0.022	0.00572	14.7	89.2	0.023
48	50304.52	-65	2175019.55	17012631.26	884.9	1.967	1.18329	31	2.295	0.022	0.00543	13.7	89.9	0.023
49	50304.52	-60	2175022.58	17012627.28	884.9	2.216	1.34472	31.3	2.592	0.022	0.00481	12.2	91	0.023
50	50304.52	-55	2175025.61	17012623.3	884.9	2.51	1.53851	31.5	2.944	0.021	0.00372	9.9	92.7	0.022
51	50304.52	-50	2175028.64	17012619.33	884.9	2.859	1.77277	31.8	3.364	0.019	0.00223	6.6	95.5	0.019
52	50304.52	-45	2175031.67	17012615.35	884.9	3.273	2.05768	32.2	3.866	0.016	0.00306	11	100.2	0.016
53	50304.52	-40	2175034.7	17012611.37	884.9	3.765	2.40578	32.6	4.468	0.01	0.008	37.7	100	0.012
54	50304.52	-35	2175037.73	17012607.4	884.9	4.349	2.8318	33.1	5.19	0.007	0.01625	65.3	62.3	0.017



55	50304.52	-30	2175040.77	17012603.42	884.9	5.036	3.35141	33.6	6.049	0.019	0.02888	56.6	66.8	0.034
56	50304.52	-25	2175043.8	17012599.44	884.9	5.831	3.97749	34.3	7.058	0.04	0.0475	50	71.5	0.062
57	50304.52	-20	2175046.83	17012595.47	884.9	6.724	4.71171	35	8.211	0.068	0.07361	47.2	74.9	0.1
58	50304.52	-15	2175049.86	17012591.49	884.9	7.676	5.52871	35.8	9.46	0.103	0.10756	46.2	77.8	0.149
59	50304.52	-10	2175052.89	17012587.51	884.9	8.598	6.35399	36.5	10.691	0.141	0.14644	46.1	80.9	0.203
60	50304.52	-5	2175055.92	17012583.54	884.9	9.349	7.0496	37	11.709	0.174	0.18232	46.3	84.4	0.252
61	50304.52	0	2175058.95	17012579.56	884.9	9.76	7.44062	37.3	12.273	0.194	0.20337	46.4	88.3	0.281
62	50304.52	5	2175061.98	17012575.58	884.9	9.716	7.40226	37.3	12.214	0.192	0.20063	46.3	92.4	0.278
63	50304.52	10	2175065.01	17012571.61	884.9	9.229	6.94777	37	11.552	0.17	0.17523	45.9	96.3	0.244
64	50304.52	15	2175068.04	17012567.63	884.9	8.434	6.21809	36.4	10.478	0.135	0.13747	45.5	99.7	0.193
65	50304.52	20	2175071.08	17012563.65	884.9	7.497	5.38637	35.7	9.231	0.097	0.09882	45.4	102.8	0.139
66	50304.52	25	2175074.11	17012559.68	884.9	6.551	4.57987	35	7.993	0.064	0.06622	46.2	105.8	0.092
67	50304.52	30	2175077.14	17012555.7	884.9	5.673	3.86317	34.3	6.864	0.036	0.04169	48.8	109.6	0.055
68	50304.52	35	2175080.17	17012551.72	884.9	4.898	3.25561	33.6	5.881	0.017	0.02451	55.3	115.4	0.03
69	50304.52	40	2175083.2	17012547.75	884.9	4.23	2.75279	33.1	5.047	0.007	0.01303	61.8	121.9	0.013
70	50304.52	45	2175086.23	17012543.77	884.9	3.664	2.34095	32.6	4.348	0.011	0.00575	28	72.8	0.011
71	50304.52	50	2175089.26	17012539.79	884.9	3.187	2.00443	32.2	3.765	0.016	0.00222	7.9	79.7	0.016
72	50304.52	55	2175092.29	17012535.82	884.9	2.786	1.72883	31.8	3.279	0.019	0.00323	9.5	84.8	0.019
73	50304.52	60	2175095.32	17012531.84	884.9	2.448	1.50202	31.5	2.872	0.021	0.0047	12.6	87.5	0.022
74	50304.52	65	2175098.35	17012527.86	884.9	2.163	1.31418	31.3	2.531	0.022	0.0056	14.4	89.2	0.023
75	50304.52	70	2175101.39	17012523.89	884.9	1.921	1.15754	31.1	2.243	0.022	0.00606	15.5	90.2	0.023
76	50304.52	75	2175104.42	17012519.91	884.9	1.715	1.02599	30.9	1.999	0.021	0.00622	16.2	90.8	0.022
77	50304.52	80	2175107.45	17012515.93	884.9	1.538	0.91471	30.7	1.79	0.021	0.0062	16.7	91.2	0.022
78	50304.52	85	2175110.48	17012511.96	884.9	1.386	0.81993	30.6	1.611	0.02	0.00605	17	91.5	0.021
79	50304.52	90	2175113.51	17012507.98	884.9	1.255	0.73869	30.5	1.456	0.019	0.00584	17.2	91.7	0.02
80	50304.52	95	2175116.54	17012504.01	884.9	1.14	0.6686	30.4	1.322	0.018	0.00559	17.3	91.8	0.019
81	50304.52	100	2175119.57	17012500.03	884.9	1.04	0.60777	30.3	1.205	0.017	0.00532	17.4	91.9	0.018
82	50304.52	105	2175122.6	17012496.05	884.9	0.952	0.5547	30.2	1.102	0.016	0.00504	17.5	92	0.017
83	50304.52	110	2175125.63	17012492.08	884.9	0.875	0.50815	30.1	1.012	0.015	0.00477	17.5	92	0.016
84	50304.52	115	2175128.66	17012488.1	884.9	0.806	0.46711	30.1	0.932	0.014	0.00451	17.6	92	0.015
85	50304.52	120	2175131.69	17012484.12	884.9	0.745	0.43078	30	0.861	0.013	0.00426	17.6	92	0.014
86	50304.52	125	2175134.73	17012480.15	884.9	0.691	0.39846	30	0.797	0.013	0.00402	17.6	92	0.013
87	50304.52	130	2175137.76	17012476.17	884.9	0.642	0.36961	29.9	0.741	0.012	0.0038	17.6	92	0.013
88	50304.52	135	2175140.79	17012472.19	884.9	0.598	0.34374	29.9	0.69	0.011	0.00359	17.6	91.9	0.012
89	50304.52	140	2175143.82	17012468.22	884.9	0.558	0.32047	29.9	0.644	0.011	0.0034	17.7	91.9	0.011
90	50304.52	145	2175146.85	17012464.24	884.9	0.523	0.29947	29.8	0.602	0.01	0.00321	17.7	91.9	0.011
91	50304.52	150	2175149.88	17012460.26	884.9	0.49	0.28046	29.8	0.565	0.01	0.00304	17.7	91.9	0.01
92	50304.52	155	2175152.91	17012456.29	884.9	0.46	0.26318	29.8	0.53	0.009	0.00288	17.7	91.8	0.01
93	50304.52	160	2175155.94	17012452.31	884.9	0.433	0.24745	29.7	0.499	0.009	0.00273	17.7	91.8	0.009
94	50304.52	165	2175158.97	17012448.33	884.9	0.409	0.23309	29.7	0.47	0.008	0.0026	17.7	91.8	0.009
95	50304.52	170	2175162	17012444.36	884.9	0.386	0.21993	29.7	0.444	0.008	0.00247	17.6	91.7	0.008
96	50304.52	175	2175165.04	17012440.38	884.9	0.365	0.20786	29.7	0.42	0.007	0.00235	17.6	91.7	0.008
97	50304.52	180	2175168.07	17012436.4	884.9	0.346	0.19676	29.6	0.398	0.007	0.00223	17.6	91.7	0.007
98	50304.52	185	2175171.1	17012432.43	884.9	0.328	0.18652	29.6	0.377	0.007	0.00213	17.6	91.6	0.007
99	50304.52	190	2175174.13	17012428.45	884.9	0.312	0.17706	29.6	0.359	0.006	0.00203	17.6	91.6	0.007
100	50304.52	195	2175177.16	17012424.47	884.9	0.297	0.16831	29.6	0.341	0.006	0.00194	17.6	91.6	0.006
101	50304.52	200	2175180.19	17012420.5	884.9	0.282	0.16019	29.6	0.325	0.006	0.00185	17.6	91.5	0.006
102	50304.52	205	2175183.22	17012416.52	884.9	0.269	0.15265	29.5	0.31	0.006	0.00177	17.6	91.5	0.006
103	50304.52	210	2175186.25	17012412.54	884.9	0.257	0.14563	29.5	0.295	0.005	0.00169	17.6	91.5	0.006
104	50304.52	215	2175189.28	17012408.57	884.9	0.246	0.13909	29.5	0.282	0.005	0.00162	17.6	91.5	0.005
105	50304.52	220	2175192.31	17012404.59	884.9	0.235	0.13298	29.5	0.27	0.005	0.00156	17.6	91.4	0.005
106	50304.52	225	2175195.35	17012400.61	884.9	0.225	0.12727	29.5	0.259	0.005	0.00149	17.6	91.4	0.005
107	50304.52	230	2175198.38	17012396.64	884.9	0.216	0.12193	29.5	0.248	0.005	0.00143	17.6	91.4	0.005
108	50304.52	235	2175201.41	17012392.66	884.9	0.207	0.11691	29.5	0.238	0.004	0.00138	17.6	91.4	0.005
109	50304.52	240	2175204.44	17012388.68	884.9	0.199	0.11221	29.4	0.228	0.004	0.00132	17.6	91.3	0.004

110	50304.52	245	2175207.47	17012384.71	884.9	0.191	0.10778	29.4	0.219	0.004	0.00127	17.6	91.3	0.004
111	50304.52	250	2175210.5	17012380.73	884.9	0.184	0.10362	29.4	0.211	0.004	0.00123	17.6	91.3	0.004
112	50304.52	255	2175213.53	17012376.75	884.9	0.177	0.09969	29.4	0.203	0.004	0.00118	17.6	91.3	0.004
113	50304.52	260	2175216.56	17012372.78	884.9	0.17	0.09599	29.4	0.196	0.004	0.00114	17.6	91.2	0.004
114	50304.52	265	2175219.59	17012368.8	884.9	0.164	0.0925	29.4	0.189	0.003	0.0011	17.6	91.2	0.004
115	50304.52	270	2175222.62	17012364.82	884.9	0.158	0.08919	29.4	0.182	0.003	0.00106	17.6	91.2	0.004
116	50304.52	275	2175225.65	17012360.85	884.9	0.153	0.08606	29.4	0.176	0.003	0.00102	17.6	91.2	0.003
117	50304.52	280	2175228.69	17012356.87	884.9	0.148	0.0831	29.4	0.17	0.003	0.00099	17.6	91.2	0.003
118	50304.52	285	2175231.72	17012352.89	884.9	0.143	0.08029	29.3	0.164	0.003	0.00096	17.6	91.1	0.003
119	50304.52	290	2175234.75	17012348.92	884.9	0.138	0.07762	29.3	0.158	0.003	0.00092	17.6	91.1	0.003
120	50304.52	295	2175237.78	17012344.94	884.9	0.134	0.07509	29.3	0.153	0.003	0.00089	17.6	91.1	0.003
121	50304.52	300	2175240.81	17012340.97	884.9	0.129	0.07268	29.3	0.148	0.003	0.00087	17.6	91.1	0.003

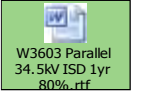
Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	11754.53	-300	2165527.8	16978343.73	789.3	0.213	0.12329	30.1	0.246	0.004	0.00102	13.3	88.9	0.004
2	11754.53	-295	2165532.8	16978343.85	789.3	0.22	0.12746	30.1	0.254	0.004	0.00105	13.3	88.9	0.005
3	11754.53	-290	2165537.8	16978343.97	789.3	0.227	0.13184	30.1	0.263	0.005	0.00108	13.3	88.9	0.005
4	11754.53	-285	2165542.79	16978344.08	789.3	0.235	0.13645	30.1	0.272	0.005	0.00112	13.3	88.9	0.005
5	11754.53	-280	2165547.79	16978344.2	789.3	0.244	0.14131	30.1	0.282	0.005	0.00115	13.2	88.8	0.005
6	11754.53	-275	2165552.79	16978344.31	789.3	0.252	0.14643	30.1	0.292	0.005	0.00119	13.2	88.8	0.005
7	11754.53	-270	2165557.79	16978344.43	789.3	0.262	0.15183	30.1	0.303	0.005	0.00123	13.2	88.8	0.005
8	11754.52	-265	2165562.79	16978344.54	789.3	0.272	0.15753	30.1	0.314	0.005	0.00128	13.2	88.8	0.006
9	11754.52	-260	2165567.79	16978344.66	789.3	0.282	0.16356	30.1	0.326	0.006	0.00132	13.2	88.8	0.006
10	11754.52	-255	2165572.79	16978344.77	789.3	0.293	0.16994	30.1	0.339	0.006	0.00137	13.2	88.8	0.006
11	11754.52	-250	2165577.78	16978344.89	789.3	0.304	0.1767	30.1	0.352	0.006	0.00142	13.2	88.7	0.006
12	11754.52	-245	2165582.78	16978345.01	789.3	0.317	0.18387	30.1	0.366	0.006	0.00147	13.2	88.7	0.006
13	11754.52	-240	2165587.78	16978345.12	789.3	0.33	0.19148	30.1	0.381	0.007	0.00152	13.2	88.7	0.007
14	11754.52	-235	2165592.78	16978345.24	789.3	0.344	0.19958	30.2	0.397	0.007	0.00158	13.1	88.7	0.007
15	11754.52	-230	2165597.78	16978345.35	789.3	0.358	0.20819	30.2	0.414	0.007	0.00164	13.1	88.6	0.007
16	11754.52	-225	2165602.78	16978345.47	789.3	0.374	0.21737	30.2	0.433	0.007	0.00171	13.1	88.6	0.008
17	11754.52	-220	2165607.78	16978345.58	789.3	0.391	0.22716	30.2	0.452	0.008	0.00177	13.1	88.6	0.008
18	11754.52	-215	2165612.78	16978345.7	789.3	0.409	0.23763	30.2	0.473	0.008	0.00185	13.1	88.6	0.008
19	11754.52	-210	2165617.77	16978345.81	789.3	0.428	0.24883	30.2	0.495	0.008	0.00192	13	88.5	0.009
20	11754.52	-205	2165622.77	16978345.93	789.3	0.448	0.26084	30.2	0.519	0.009	0.002	13	88.5	0.009
21	11754.51	-200	2165627.77	16978346.05	789.3	0.47	0.27373	30.2	0.544	0.009	0.00209	13	88.5	0.009
22	11754.51	-195	2165632.77	16978346.16	789.3	0.494	0.28759	30.2	0.571	0.009	0.00218	13	88.5	0.01
23	11754.51	-190	2165637.77	16978346.28	789.3	0.519	0.30252	30.2	0.601	0.01	0.00227	12.9	88.4	0.01
24	11754.51	-185	2165642.77	16978346.39	789.3	0.546	0.31863	30.2	0.633	0.01	0.00237	12.9	88.4	0.011
25	11754.51	-180	2165647.77	16978346.51	789.3	0.576	0.33606	30.3	0.667	0.011	0.00248	12.8	88.4	0.011
26	11754.51	-175	2165652.76	16978346.62	789.3	0.608	0.35493	30.3	0.704	0.011	0.00259	12.8	88.3	0.012
27	11754.51	-170	2165657.76	16978346.74	789.3	0.643	0.37542	30.3	0.744	0.012	0.00271	12.8	88.3	0.012
28	11754.51	-165	2165662.76	16978346.85	789.3	0.68	0.39772	30.3	0.788	0.013	0.00283	12.7	88.3	0.013
29	11754.51	-160	2165667.76	16978346.97	789.3	0.721	0.42204	30.3	0.836	0.013	0.00296	12.6	88.3	0.014
30	11754.51	-155	2165672.76	16978347.09	789.3	0.766	0.44862	30.3	0.888	0.014	0.0031	12.6	88.2	0.014
31	11754.51	-150	2165677.76	16978347.2	789.3	0.815	0.47776	30.4	0.945	0.015	0.00325	12.5	88.2	0.015
32	11754.51	-145	2165682.76	16978347.32	789.3	0.869	0.50979	30.4	1.008	0.015	0.0034	12.4	88.2	0.016
33	11754.51	-140	2165687.76	16978347.43	789.3	0.928	0.54509	30.4	1.077	0.016	0.00356	12.3	88.2	0.017
34	11754.5	-135	2165692.75	16978347.55	789.3	0.994	0.58412	30.4	1.153	0.017	0.00372	12.2	88.1	0.018
35	11754.5	-130	2165697.75	16978347.66	789.3	1.066	0.6274	30.5	1.237	0.018	0.00388	12.1	88.1	0.019
36	11754.5	-125	2165702.75	16978347.78	789.3	1.146	0.67557	30.5	1.33	0.019	0.00405	11.9	88.1	0.02
37	11754.5	-120	2165707.75	16978347.9	789.3	1.235	0.72937	30.6	1.435	0.02	0.00422	11.7	88.1	0.021
38	11754.5	-115	2165712.75	16978348.01	789.3	1.335	0.78969	30.6	1.551	0.021	0.00437	11.5	88.1	0.022
39	11754.5	-110	2165717.75	16978348.13	789.3	1.447	0.85759	30.7	1.682	0.023	0.00451	11.2	88.1	0.023
40	11754.5	-105	2165722.75	16978348.24	789.3	1.573	0.93435	30.7	1.829	0.024	0.00463	10.9	88.2	0.024
41	11754.5	-100	2165727.74	16978348.36	789.3	1.715	1.02153	30.8	1.996	0.025	0.00471	10.5	88.3	0.026
42	11754.5	-95	2165732.74	16978348.47	789.3	1.876	1.121	30.9	2.186	0.027	0.00472	10	88.4	0.027
43	11754.5	-90	2165737.74	16978348.59	789.3	2.061	1.23507	30.9	2.402	0.028	0.00464	9.4	88.5	0.028
44	11754.5	-85	2165742.74	16978348.7	789.3	2.271	1.3666	31	2.651	0.029	0.00442	8.6	88.7	0.03
45	11754.5	-80	2165747.74	16978348.82	789.3	2.514	1.51907	31.1	2.937	0.03	0.00401	7.6	89.1	0.03
46	11754.5	-75	2165752.74	16978348.94	789.3	2.793	1.69686	31.3	3.268	0.031	0.00332	6.1	89.5	0.031
47	11754.49	-70	2165757.74	16978349.05	789.3	3.118	1.90536	31.4	3.654	0.031	0.0023	4.2	90.2	0.031
48	11754.49	-65	2165762.74	16978349.17	789.3	3.497	2.15132	31.6	4.106	0.031	0.00138	2.6	91.1	0.031
49	11754.49	-60	2165767.73	16978349.28	789.3	3.939	2.44307	31.8	4.635	0.029	0.0031	6	92.5	0.029
50	11754.49	-55	2165772.73	16978349.4	789.3	4.458	2.79085	32	5.26	0.026	0.00706	15.1	94.1	0.027
51	11754.49	-50	2165777.73	16978349.51	789.3	5.068	3.207	32.3	5.997	0.021	0.01315	32.4	93.8	0.024
52	11754.49	-45	2165782.73	16978349.63	789.3	5.782	3.70582	32.7	6.868	0.013	0.02216	59.5	83	0.024
53	11754.49	-40	2165787.73	16978349.74	789.3	6.616	4.30269	33	7.892	0.011	0.03527	73.3	72.3	0.036
54	11754.49	-35	2165792.73	16978349.86	789.3	7.58	5.01168	33.5	9.087	0.027	0.05403	63.4	72.4	0.06



55	11754.49	-30	2165797.73	16978349.98	789.3	8.673	5.84028	34	10.456	0.054	0.08016	55.8	74.5	0.097
56	11754.49	-25	2165802.72	16978350.09	789.3	9.875	6.77992	34.5	11.978	0.091	0.11509	51.7	76.8	0.147
57	11754.49	-20	2165807.72	16978350.21	789.3	11.131	7.79219	35	13.587	0.135	0.15877	49.6	79	0.208
58	11754.49	-15	2165812.72	16978350.32	789.3	12.344	8.7955	35.5	15.157	0.183	0.2081	48.7	81.4	0.277
59	11754.49	-10	2165817.72	16978350.44	789.3	13.375	9.66525	35.9	16.502	0.228	0.25571	48.3	84.1	0.343
60	11754.48	-5	2165822.72	16978350.55	789.3	14.073	10.26113	36.1	17.417	0.261	0.29099	48.1	87	0.391
61	11754.48	0	2165827.72	16978350.67	789.3	14.322	10.47434	36.2	17.743	0.273	0.30417	48.1	90	0.409
62	11754.48	5	2165832.72	16978350.78	789.3	14.077	10.26472	36.1	17.422	0.261	0.29127	48.1	93	0.391
63	11754.48	10	2165837.72	16978350.9	789.3	13.383	9.67201	35.9	16.512	0.229	0.2562	48.3	95.9	0.343
64	11754.48	15	2165842.71	16978351.02	789.3	12.355	8.8045	35.5	15.171	0.184	0.20868	48.6	98.5	0.278
65	11754.48	20	2165847.71	16978351.13	789.3	11.144	7.80222	35	13.603	0.136	0.15934	49.6	100.9	0.209
66	11754.48	25	2165852.71	16978351.25	789.3	9.888	6.78992	34.5	11.994	0.091	0.11558	51.7	103.2	0.147
67	11754.48	30	2165857.71	16978351.36	789.3	8.685	5.84954	34	10.472	0.055	0.08055	55.7	105.4	0.097
68	11754.48	35	2165862.71	16978351.48	789.3	7.591	5.01989	33.5	9.101	0.027	0.05432	63.2	107.6	0.06
69	11754.48	40	2165867.71	16978351.59	789.3	6.626	4.30977	33	7.905	0.011	0.03548	73.3	107.7	0.036
70	11754.48	45	2165872.71	16978351.71	789.3	5.791	3.71184	32.7	6.878	0.013	0.02231	59.9	97.3	0.024
71	11754.48	50	2165877.7	16978351.82	789.3	5.075	3.21208	32.3	6.006	0.021	0.01326	32.8	86.3	0.024
72	11754.48	55	2165882.7	16978351.94	789.3	4.465	2.79513	32	5.267	0.026	0.00714	15.4	85.9	0.027
73	11754.47	60	2165887.7	16978352.06	789.3	3.945	2.44668	31.8	4.642	0.029	0.00315	6.2	87.5	0.029
74	11754.47	65	2165892.7	16978352.17	789.3	3.501	2.15437	31.6	4.111	0.031	0.00138	2.6	88.8	0.031
75	11754.47	70	2165897.7	16978352.29	789.3	3.122	1.90796	31.4	3.659	0.031	0.00227	4.2	89.8	0.031
76	11754.47	75	2165902.7	16978352.4	789.3	2.797	1.69908	31.3	3.273	0.031	0.0033	6.1	90.5	0.031
77	11754.47	80	2165907.7	16978352.52	789.3	2.517	1.52098	31.1	2.94	0.03	0.00399	7.5	90.9	0.03
78	11754.47	85	2165912.7	16978352.63	789.3	2.274	1.36824	31	2.654	0.029	0.00441	8.6	91.3	0.029
79	11754.47	90	2165917.69	16978352.75	789.3	2.063	1.2365	30.9	2.405	0.028	0.00463	9.4	91.5	0.028
80	11754.47	95	2165922.69	16978352.86	789.3	1.878	1.12224	30.9	2.188	0.027	0.00471	10	91.6	0.027
81	11754.47	100	2165927.69	16978352.98	789.3	1.717	1.02261	30.8	1.998	0.025	0.0047	10.5	91.7	0.026
82	11754.47	105	2165932.69	16978353.1	789.3	1.574	0.93531	30.7	1.831	0.024	0.00463	10.9	91.8	0.024
83	11754.47	110	2165937.69	16978353.21	789.3	1.448	0.85844	30.7	1.684	0.023	0.00451	11.2	91.9	0.023
84	11754.47	115	2165942.69	16978353.33	789.3	1.336	0.79044	30.6	1.553	0.022	0.00437	11.5	91.9	0.022
85	11754.47	120	2165947.69	16978353.44	789.3	1.236	0.73004	30.6	1.436	0.02	0.00421	11.7	91.9	0.021
86	11754.46	125	2165952.68	16978353.56	789.3	1.147	0.67617	30.5	1.331	0.019	0.00405	11.9	91.9	0.02
87	11754.46	130	2165957.68	16978353.67	789.3	1.067	0.62794	30.5	1.238	0.018	0.00388	12	91.9	0.019
88	11754.46	135	2165962.68	16978353.79	789.3	0.994	0.5846	30.5	1.154	0.017	0.00372	12.2	91.9	0.018
89	11754.46	140	2165967.68	16978353.9	789.3	0.929	0.54553	30.4	1.077	0.016	0.00356	12.3	91.8	0.017
90	11754.46	145	2165972.68	16978354.02	789.3	0.87	0.51019	30.4	1.008	0.015	0.0034	12.4	91.8	0.016
91	11754.46	150	2165977.68	16978354.14	789.3	0.816	0.47813	30.4	0.946	0.015	0.00325	12.5	91.8	0.015
92	11754.46	155	2165982.68	16978354.25	789.3	0.767	0.44895	30.3	0.889	0.014	0.0031	12.6	91.8	0.014
93	11754.46	160	2165987.68	16978354.37	789.3	0.722	0.42234	30.3	0.836	0.013	0.00296	12.6	91.7	0.014
94	11754.46	165	2165992.67	16978354.48	789.3	0.681	0.398	30.3	0.789	0.013	0.00283	12.7	91.7	0.013
95	11754.46	170	2165997.67	16978354.6	789.3	0.643	0.37568	30.3	0.745	0.012	0.00271	12.7	91.7	0.012
96	11754.46	175	2166002.67	16978354.71	789.3	0.608	0.35517	30.3	0.704	0.011	0.00259	12.8	91.7	0.012
97	11754.46	180	2166007.67	16978354.83	789.3	0.576	0.33627	30.3	0.667	0.011	0.00248	12.8	91.6	0.011
98	11754.46	185	2166012.67	16978354.94	789.3	0.547	0.31883	30.2	0.633	0.01	0.00237	12.9	91.6	0.011
99	11754.45	190	2166017.67	16978355.06	789.3	0.519	0.30271	30.2	0.601	0.01	0.00227	12.9	91.6	0.01
100	11754.45	195	2166022.67	16978355.18	789.3	0.494	0.28776	30.2	0.572	0.009	0.00218	12.9	91.5	0.01
101	11754.45	200	2166027.66	16978355.29	789.3	0.47	0.27389	30.2	0.544	0.009	0.00209	13	91.5	0.009
102	11754.45	205	2166032.66	16978355.41	789.3	0.448	0.26099	30.2	0.519	0.009	0.002	13	91.5	0.009
103	11754.45	210	2166037.66	16978355.52	789.3	0.428	0.24897	30.2	0.495	0.008	0.00192	13	91.5	0.009
104	11754.45	215	2166042.66	16978355.64	789.3	0.409	0.23776	30.2	0.473	0.008	0.00185	13.1	91.4	0.008
105	11754.45	220	2166047.66	16978355.75	789.3	0.391	0.22728	30.2	0.452	0.008	0.00177	13.1	91.4	0.008
106	11754.45	225	2166052.66	16978355.87	789.3	0.374	0.21748	30.2	0.433	0.007	0.00171	13.1	91.4	0.008
107	11754.45	230	2166057.66	16978355.98	789.3	0.358	0.20829	30.2	0.415	0.007	0.00164	13.1	91.4	0.007
108	11754.45	235	2166062.66	16978356.1	789.3	0.344	0.19967	30.2	0.397	0.007	0.00158	13.1	91.3	0.007
109	11754.45	240	2166067.65	16978356.22	789.3	0.33	0.19158	30.1	0.381	0.007	0.00152	13.1	91.3	0.007

110	11754.45	245	2166072.65	16978356.33	789.3	0.317	0.18396	30.1	0.366	0.006	0.00147	13.2	91.3	0.006
111	11754.45	250	2166077.65	16978356.45	789.3	0.305	0.17678	30.1	0.352	0.006	0.00142	13.2	91.3	0.006
112	11754.44	255	2166082.65	16978356.56	789.3	0.293	0.17002	30.1	0.339	0.006	0.00137	13.2	91.2	0.006
113	11754.44	260	2166087.65	16978356.68	789.3	0.282	0.16363	30.1	0.326	0.006	0.00132	13.2	91.2	0.006
114	11754.44	265	2166092.65	16978356.79	789.3	0.272	0.1576	30.1	0.314	0.005	0.00128	13.2	91.2	0.006
115	11754.44	270	2166097.65	16978356.91	789.3	0.262	0.15189	30.1	0.303	0.005	0.00123	13.2	91.2	0.005
116	11754.44	275	2166102.64	16978357.02	789.3	0.253	0.14649	30.1	0.292	0.005	0.00119	13.2	91.2	0.005
117	11754.44	280	2166107.64	16978357.14	789.3	0.244	0.14137	30.1	0.282	0.005	0.00115	13.2	91.2	0.005
118	11754.44	285	2166112.64	16978357.26	789.3	0.235	0.13651	30.1	0.272	0.005	0.00112	13.3	91.1	0.005
119	11754.44	290	2166117.64	16978357.37	789.3	0.228	0.13189	30.1	0.263	0.005	0.00108	13.3	91.1	0.005
120	11754.44	295	2166122.64	16978357.49	789.3	0.22	0.12751	30.1	0.254	0.004	0.00105	13.3	91.1	0.005
121	11754.44	300	2166127.64	16978357.6	789.3	0.213	0.12334	30.1	0.246	0.004	0.00102	13.3	91.1	0.004

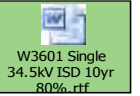
Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	52059.09	-300	2174075.43	17012228.98	836.32	0.152	0.08847	30.2	0.176	0.003	0.001	18.4	88.9	0.003
2	52059.09	-295	2174080.43	17012229.11	836.32	0.157	0.09127	30.2	0.182	0.003	0.00103	18.4	88.9	0.003
3	52059.09	-290	2174085.43	17012229.23	836.32	0.162	0.09422	30.2	0.187	0.003	0.00107	18.4	88.9	0.003
4	52059.09	-285	2174090.43	17012229.36	836.32	0.167	0.09731	30.2	0.194	0.003	0.0011	18.4	88.9	0.003
5	52059.09	-280	2174095.43	17012229.48	836.32	0.173	0.10057	30.2	0.2	0.003	0.00114	18.4	88.9	0.004
6	52059.09	-275	2174100.43	17012229.61	836.32	0.179	0.104	30.2	0.207	0.004	0.00118	18.4	88.8	0.004
7	52059.09	-270	2174105.42	17012229.73	836.32	0.185	0.10762	30.2	0.214	0.004	0.00122	18.4	88.8	0.004
8	52059.09	-265	2174110.42	17012229.86	836.32	0.191	0.11144	30.2	0.221	0.004	0.00126	18.4	88.8	0.004
9	52059.09	-260	2174115.42	17012229.98	836.32	0.198	0.11548	30.2	0.229	0.004	0.0013	18.4	88.8	0.004
10	52059.09	-255	2174120.42	17012230.11	836.32	0.206	0.11975	30.2	0.238	0.004	0.00135	18.4	88.8	0.004
11	52059.09	-250	2174125.42	17012230.23	836.32	0.213	0.12427	30.2	0.247	0.004	0.0014	18.4	88.8	0.004
12	52059.09	-245	2174130.42	17012230.36	836.32	0.221	0.12906	30.2	0.256	0.004	0.00145	18.4	88.7	0.005
13	52059.09	-240	2174135.41	17012230.48	836.32	0.23	0.13414	30.2	0.266	0.005	0.00151	18.4	88.7	0.005
14	52059.09	-235	2174140.41	17012230.61	836.32	0.239	0.13955	30.3	0.277	0.005	0.00157	18.4	88.7	0.005
15	52059.09	-230	2174145.41	17012230.73	836.32	0.249	0.14529	30.3	0.288	0.005	0.00163	18.4	88.7	0.005
16	52059.09	-225	2174150.41	17012230.86	836.32	0.259	0.15141	30.3	0.3	0.005	0.00169	18.4	88.6	0.005
17	52059.09	-220	2174155.41	17012230.98	836.32	0.27	0.15793	30.3	0.313	0.005	0.00176	18.4	88.6	0.006
18	52059.09	-215	2174160.41	17012231.1	836.32	0.282	0.1649	30.3	0.327	0.006	0.00183	18.4	88.6	0.006
19	52059.09	-210	2174165.41	17012231.23	836.32	0.295	0.17235	30.3	0.342	0.006	0.00191	18.4	88.6	0.006
20	52059.09	-205	2174170.4	17012231.35	836.32	0.308	0.18034	30.3	0.357	0.006	0.00199	18.4	88.6	0.006
21	52059.09	-200	2174175.4	17012231.48	836.32	0.323	0.1889	30.3	0.374	0.006	0.00208	18.4	88.5	0.007
22	52059.09	-195	2174180.4	17012231.6	836.32	0.338	0.1981	30.3	0.392	0.007	0.00217	18.4	88.5	0.007
23	52059.09	-190	2174185.4	17012231.73	836.32	0.355	0.208	30.4	0.411	0.007	0.00226	18.4	88.5	0.007
24	52059.09	-185	2174190.4	17012231.85	836.32	0.373	0.21867	30.4	0.432	0.007	0.00237	18.4	88.5	0.008
25	52059.09	-180	2174195.4	17012231.98	836.32	0.392	0.2302	30.4	0.455	0.007	0.00248	18.4	88.4	0.008
26	52059.09	-175	2174200.39	17012232.1	836.32	0.413	0.24268	30.4	0.479	0.008	0.00259	18.4	88.4	0.008
27	52059.09	-170	2174205.39	17012232.23	836.32	0.436	0.25621	30.4	0.506	0.008	0.00272	18.4	88.4	0.009
28	52059.09	-165	2174210.39	17012232.35	836.32	0.461	0.27092	30.5	0.534	0.009	0.00285	18.4	88.4	0.009
29	52059.09	-160	2174215.39	17012232.48	836.32	0.487	0.28693	30.5	0.565	0.009	0.00299	18.4	88.3	0.009
30	52059.09	-155	2174220.39	17012232.6	836.32	0.516	0.30442	30.5	0.599	0.009	0.00314	18.4	88.3	0.01
31	52059.09	-150	2174225.39	17012232.73	836.32	0.548	0.32357	30.6	0.637	0.01	0.00329	18.3	88.3	0.01
32	52059.09	-145	2174230.39	17012232.85	836.32	0.583	0.34457	30.6	0.677	0.01	0.00346	18.3	88.3	0.011
33	52059.09	-140	2174235.38	17012232.98	836.32	0.621	0.36769	30.6	0.722	0.011	0.00364	18.3	88.3	0.012
34	52059.09	-135	2174240.38	17012233.1	836.32	0.663	0.3932	30.7	0.771	0.012	0.00382	18.3	88.2	0.012
35	52059.09	-130	2174245.38	17012233.23	836.32	0.71	0.42144	30.7	0.825	0.012	0.00402	18.3	88.2	0.013
36	52059.09	-125	2174250.38	17012233.35	836.32	0.761	0.45281	30.8	0.885	0.013	0.00422	18.2	88.2	0.013
37	52059.09	-120	2174255.38	17012233.48	836.32	0.818	0.48776	30.8	0.952	0.013	0.00443	18.2	88.3	0.014
38	52059.09	-115	2174260.38	17012233.6	836.32	0.881	0.52685	30.9	1.027	0.014	0.00464	18.1	88.3	0.015
39	52059.09	-110	2174265.37	17012233.72	836.32	0.952	0.57074	30.9	1.11	0.015	0.00486	18.1	88.3	0.016
40	52059.09	-105	2174270.37	17012233.85	836.32	1.031	0.6202	31	1.203	0.016	0.00507	18	88.4	0.016
41	52059.09	-100	2174275.37	17012233.97	836.32	1.12	0.6762	31.1	1.308	0.016	0.00527	17.8	88.5	0.017
42	52059.09	-95	2174280.37	17012234.1	836.32	1.221	0.73987	31.2	1.428	0.017	0.00544	17.7	88.6	0.018
43	52059.09	-90	2174285.37	17012234.22	836.32	1.335	0.81262	31.3	1.563	0.018	0.00557	17.4	88.8	0.019
44	52059.09	-85	2174290.37	17012234.35	836.32	1.465	0.89613	31.5	1.717	0.018	0.00563	17.1	89.1	0.019
45	52059.09	-80	2174295.36	17012234.47	836.32	1.613	0.99249	31.6	1.894	0.019	0.00559	16.6	89.5	0.02
46	52059.09	-75	2174300.36	17012234.6	836.32	1.783	1.10428	31.8	2.097	0.019	0.00538	15.8	90.1	0.02
47	52059.09	-70	2174305.36	17012234.72	836.32	1.978	1.23464	32	2.332	0.019	0.00495	14.7	91	0.019
48	52059.09	-65	2174310.36	17012234.85	836.32	2.204	1.3875	32.2	2.604	0.018	0.00417	12.9	92.3	0.019
49	52059.09	-60	2174315.36	17012234.97	836.32	2.465	1.56764	32.5	2.921	0.017	0.00297	10.1	94.5	0.017
50	52059.09	-55	2174320.36	17012235.1	836.32	2.769	1.78093	32.8	3.292	0.014	0.00173	6.9	98.2	0.014
51	52059.09	-50	2174325.36	17012235.22	836.32	3.121	2.03442	33.1	3.725	0.011	0.00348	18.2	103.8	0.011
52	52059.09	-45	2174330.35	17012235.35	836.32	3.53	2.33632	33.5	4.233	0.006	0.00817	53.6	78.4	0.008
53	52059.09	-40	2174335.35	17012235.47	836.32	4.003	2.69573	34	4.826	0.008	0.01537	62.6	64	0.017
54	52059.09	-35	2174340.35	17012235.6	836.32	4.545	3.12159	34.5	5.514	0.019	0.02582	53.2	69.7	0.032



55	52059.09	-30	2174345.35	17012235.72	836.32	5.159	3.62046	35.1	6.303	0.036	0.04051	48.5	73.6	0.054
56	52059.09	-25	2174350.35	17012235.85	836.32	5.837	4.19208	35.7	7.186	0.057	0.06037	46.5	76.3	0.083
57	52059.09	-20	2174355.35	17012235.97	836.32	6.556	4.82197	36.3	8.138	0.083	0.08573	45.8	78.7	0.12
58	52059.09	-15	2174360.34	17012236.09	836.32	7.272	5.47139	37	9.1	0.112	0.11537	45.8	81	0.161
59	52059.09	-10	2174365.34	17012236.22	836.32	7.91	6.06915	37.5	9.97	0.14	0.14555	46.1	83.5	0.202
60	52059.09	-5	2174370.34	17012236.34	836.32	8.377	6.51594	37.9	10.612	0.162	0.1698	46.4	86.4	0.235
61	52059.09	0	2174375.34	17012236.47	836.32	8.579	6.71318	38	10.894	0.172	0.18103	46.5	89.5	0.249
62	52059.09	5	2174380.34	17012236.59	836.32	8.472	6.61006	38	10.746	0.167	0.17534	46.5	92.6	0.242
63	52059.09	10	2174385.34	17012236.72	836.32	8.08	6.23356	37.6	10.205	0.148	0.15478	46.2	95.6	0.214
64	52059.09	15	2174390.34	17012236.84	836.32	7.485	5.67212	37.2	9.391	0.122	0.12583	45.9	98.2	0.175
65	52059.09	20	2174395.33	17012236.97	836.32	6.783	5.02934	36.6	8.444	0.093	0.09551	45.7	100.5	0.133
66	52059.09	25	2174400.33	17012237.09	836.32	6.058	4.38701	35.9	7.48	0.066	0.06852	46.1	102.8	0.095
67	52059.09	30	2174405.33	17012237.22	836.32	5.363	3.79377	35.3	6.569	0.043	0.04683	47.6	105.3	0.063
68	52059.09	35	2174410.33	17012237.34	836.32	4.727	3.27076	34.7	5.749	0.025	0.0305	51.1	108.6	0.039
69	52059.09	40	2174415.33	17012237.47	836.32	4.162	2.82181	34.1	5.028	0.011	0.01873	58.7	113.5	0.022
70	52059.09	45	2174420.33	17012237.59	836.32	3.667	2.44193	33.7	4.406	0.005	0.01053	63.9	116	0.011
71	52059.09	50	2174425.32	17012237.72	836.32	3.239	2.12258	33.2	3.872	0.009	0.00501	30	76.2	0.009
72	52059.09	55	2174430.32	17012237.84	836.32	2.869	1.85454	32.9	3.417	0.013	0.0019	8.4	79.8	0.013
73	52059.09	60	2174435.32	17012237.97	836.32	2.552	1.62925	32.6	3.027	0.016	0.00232	8.4	84.3	0.016
74	52059.09	65	2174440.32	17012238.09	836.32	2.278	1.43924	32.3	2.694	0.017	0.00364	11.8	87	0.018
75	52059.09	70	2174445.32	17012238.22	836.32	2.042	1.2783	32.1	2.409	0.018	0.00456	14	88.6	0.019
76	52059.09	75	2174450.32	17012238.34	836.32	1.837	1.14128	31.8	2.163	0.019	0.00512	15.3	89.6	0.019
77	52059.09	80	2174455.32	17012238.47	836.32	1.66	1.02401	31.7	1.95	0.019	0.0054	16.2	90.3	0.019
78	52059.09	85	2174460.31	17012238.59	836.32	1.506	0.9231	31.5	1.766	0.018	0.00551	16.8	90.7	0.019
79	52059.09	90	2174465.31	17012238.71	836.32	1.37	0.83581	31.4	1.605	0.018	0.00549	17.2	91.1	0.019
80	52059.09	95	2174470.31	17012238.84	836.32	1.252	0.75991	31.3	1.464	0.017	0.00539	17.5	91.3	0.018
81	52059.09	100	2174475.31	17012238.96	836.32	1.147	0.69358	31.2	1.341	0.016	0.00524	17.7	91.4	0.017
82	52059.09	105	2174480.31	17012239.09	836.32	1.055	0.63534	31.1	1.231	0.016	0.00505	17.8	91.6	0.016
83	52059.09	110	2174485.31	17012239.21	836.32	0.973	0.58397	31	1.135	0.015	0.00485	17.9	91.6	0.016
84	52059.09	115	2174490.3	17012239.34	836.32	0.9	0.53847	30.9	1.048	0.014	0.00464	18	91.7	0.015
85	52059.09	120	2174495.3	17012239.46	836.32	0.834	0.49799	30.8	0.971	0.014	0.00443	18.1	91.7	0.014
86	52059.09	125	2174500.3	17012239.59	836.32	0.775	0.46185	30.8	0.903	0.013	0.00422	18.1	91.7	0.014
87	52059.09	130	2174505.3	17012239.71	836.32	0.723	0.42946	30.7	0.841	0.012	0.00402	18.2	91.7	0.013
88	52059.09	135	2174510.3	17012239.84	836.32	0.675	0.40033	30.7	0.785	0.012	0.00383	18.2	91.7	0.012
89	52059.09	140	2174515.3	17012239.96	836.32	0.632	0.37404	30.6	0.734	0.011	0.00364	18.2	91.7	0.012
90	52059.09	145	2174520.29	17012240.09	836.32	0.592	0.35025	30.6	0.688	0.011	0.00347	18.2	91.7	0.011
91	52059.09	150	2174525.29	17012240.21	836.32	0.557	0.32865	30.6	0.646	0.01	0.0033	18.3	91.7	0.011
92	52059.09	155	2174530.29	17012240.34	836.32	0.524	0.30899	30.5	0.608	0.01	0.00314	18.3	91.7	0.01
93	52059.09	160	2174535.29	17012240.46	836.32	0.494	0.29104	30.5	0.574	0.009	0.00299	18.3	91.7	0.01
94	52059.09	165	2174540.29	17012240.59	836.32	0.467	0.27462	30.5	0.542	0.009	0.00285	18.3	91.6	0.009
95	52059.09	170	2174545.29	17012240.71	836.32	0.442	0.25955	30.4	0.512	0.008	0.00272	18.3	91.6	0.009
96	52059.09	175	2174550.29	17012240.84	836.32	0.419	0.2457	30.4	0.485	0.008	0.0026	18.3	91.6	0.008
97	52059.09	180	2174555.28	17012240.96	836.32	0.397	0.23294	30.4	0.46	0.007	0.00248	18.3	91.6	0.008
98	52059.09	185	2174560.28	17012241.08	836.32	0.377	0.22116	30.4	0.437	0.007	0.00237	18.3	91.5	0.008
99	52059.09	190	2174565.28	17012241.21	836.32	0.359	0.21026	30.4	0.416	0.007	0.00226	18.3	91.5	0.007
100	52059.09	195	2174570.28	17012241.33	836.32	0.342	0.20016	30.3	0.396	0.007	0.00217	18.3	91.5	0.007
101	52059.09	200	2174575.28	17012241.46	836.32	0.326	0.19078	30.3	0.378	0.006	0.00207	18.3	91.5	0.007
102	52059.09	205	2174580.28	17012241.58	836.32	0.311	0.18206	30.3	0.361	0.006	0.00199	18.3	91.4	0.006
103	52059.09	210	2174585.27	17012241.71	836.32	0.298	0.17394	30.3	0.345	0.006	0.00191	18.3	91.4	0.006
104	52059.09	215	2174590.27	17012241.83	836.32	0.285	0.16635	30.3	0.33	0.006	0.00183	18.3	91.4	0.006
105	52059.09	220	2174595.27	17012241.96	836.32	0.273	0.15927	30.3	0.316	0.005	0.00176	18.3	91.4	0.006
106	52059.09	225	2174600.27	17012242.08	836.32	0.262	0.15264	30.3	0.303	0.005	0.00169	18.3	91.4	0.005
107	52059.09	230	2174605.27	17012242.21	836.32	0.251	0.14642	30.2	0.291	0.005	0.00162	18.3	91.3	0.005
108	52059.09	235	2174610.27	17012242.33	836.32	0.241	0.14059	30.2	0.279	0.005	0.00156	18.3	91.3	0.005
109	52059.09	240	2174615.27	17012242.46	836.32	0.232	0.13511	30.2	0.268	0.005	0.0015	18.3	91.3	0.005

110	52059.09	245	2174620.26	17012242.58	836.32	0.223	0.12995	30.2	0.258	0.004	0.00145	18.3	91.3	0.005
111	52059.09	250	2174625.26	17012242.71	836.32	0.215	0.1251	30.2	0.249	0.004	0.0014	18.3	91.3	0.004
112	52059.09	255	2174630.26	17012242.83	836.32	0.207	0.12052	30.2	0.24	0.004	0.00135	18.3	91.2	0.004
113	52059.09	260	2174635.26	17012242.96	836.32	0.2	0.1162	30.2	0.231	0.004	0.0013	18.3	91.2	0.004
114	52059.09	265	2174640.26	17012243.08	836.32	0.193	0.11211	30.2	0.223	0.004	0.00125	18.3	91.2	0.004
115	52059.09	270	2174645.26	17012243.21	836.32	0.186	0.10825	30.2	0.215	0.004	0.00121	18.3	91.2	0.004
116	52059.09	275	2174650.25	17012243.33	836.32	0.18	0.10459	30.2	0.208	0.004	0.00117	18.3	91.2	0.004
117	52059.09	280	2174655.25	17012243.46	836.32	0.174	0.10112	30.2	0.201	0.003	0.00113	18.3	91.1	0.004
118	52059.09	285	2174660.25	17012243.58	836.32	0.168	0.09783	30.2	0.195	0.003	0.00109	18.3	91.1	0.003
119	52059.09	290	2174665.25	17012243.7	836.32	0.163	0.09471	30.2	0.189	0.003	0.00106	18.2	91.1	0.003
120	52059.09	295	2174670.25	17012243.83	836.32	0.158	0.09174	30.1	0.183	0.003	0.00103	18.2	91.1	0.003
121	52059.09	300	2174675.25	17012243.95	836.32	0.153	0.08891	30.1	0.177	0.003	0.00099	18.2	91.1	0.003

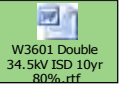
Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	169.65	-300	2150485.41	16931421.68	636.15	0.165	0.10145	31.6	0.194	0.003	0.00102	17.3	89	0.003
2	169.65	-295	2150490.23	16931420.34	636.15	0.17	0.10426	31.6	0.199	0.003	0.00105	17.3	89	0.004
3	169.65	-290	2150495.04	16931419	636.15	0.175	0.1072	31.6	0.205	0.003	0.00108	17.3	89	0.004
4	169.65	-285	2150499.86	16931417.66	636.15	0.18	0.11028	31.5	0.211	0.004	0.00111	17.3	89	0.004
5	169.65	-280	2150504.68	16931416.33	636.15	0.185	0.11352	31.5	0.217	0.004	0.00114	17.3	89	0.004
6	169.65	-275	2150509.49	16931414.99	636.15	0.191	0.11693	31.5	0.224	0.004	0.00117	17.3	89	0.004
7	169.65	-270	2150514.31	16931413.65	636.15	0.196	0.12051	31.5	0.23	0.004	0.00121	17.3	88.9	0.004
8	169.65	-265	2150519.13	16931412.31	636.15	0.203	0.12428	31.5	0.238	0.004	0.00125	17.3	88.9	0.004
9	169.65	-260	2150523.95	16931410.97	636.15	0.209	0.12826	31.5	0.245	0.004	0.00129	17.2	88.9	0.004
10	169.65	-255	2150528.76	16931409.63	636.15	0.216	0.13245	31.5	0.253	0.004	0.00132	17.2	88.9	0.004
11	169.65	-250	2150533.58	16931408.29	636.15	0.223	0.13688	31.5	0.262	0.004	0.00137	17.2	88.9	0.005
12	169.65	-245	2150538.4	16931406.95	636.15	0.231	0.14155	31.5	0.271	0.005	0.00141	17.2	88.9	0.005
13	169.65	-240	2150543.21	16931405.61	636.15	0.239	0.1465	31.5	0.28	0.005	0.00145	17.2	88.9	0.005
14	169.65	-235	2150548.03	16931404.27	636.15	0.247	0.15174	31.5	0.29	0.005	0.0015	17.1	88.9	0.005
15	169.65	-230	2150552.85	16931402.93	636.15	0.256	0.1573	31.5	0.301	0.005	0.00155	17.1	88.8	0.005
16	169.65	-225	2150557.67	16931401.59	636.15	0.266	0.1632	31.5	0.312	0.005	0.0016	17.1	88.8	0.005
17	169.65	-220	2150562.48	16931400.25	636.15	0.276	0.16947	31.5	0.324	0.005	0.00165	17	88.8	0.006
18	169.65	-215	2150567.3	16931398.91	636.15	0.287	0.17613	31.6	0.337	0.006	0.00171	17	88.8	0.006
19	169.65	-210	2150572.12	16931397.57	636.15	0.298	0.18324	31.6	0.35	0.006	0.00176	17	88.8	0.006
20	169.65	-205	2150576.94	16931396.23	636.15	0.311	0.19082	31.6	0.365	0.006	0.00182	16.9	88.8	0.006
21	169.65	-200	2150581.75	16931394.89	636.15	0.324	0.19891	31.6	0.38	0.006	0.00188	16.9	88.8	0.006
22	169.65	-195	2150586.57	16931393.55	636.15	0.338	0.20757	31.6	0.396	0.006	0.00194	16.8	88.8	0.007
23	169.65	-190	2150591.39	16931392.21	636.15	0.352	0.21685	31.6	0.414	0.007	0.00201	16.8	88.8	0.007
24	169.65	-185	2150596.2	16931390.88	636.15	0.368	0.22679	31.6	0.433	0.007	0.00207	16.7	88.8	0.007
25	169.65	-180	2150601.02	16931389.54	636.15	0.386	0.23748	31.6	0.453	0.007	0.00214	16.6	88.8	0.007
26	169.65	-175	2150605.84	16931388.2	636.15	0.404	0.24899	31.7	0.474	0.007	0.00221	16.6	88.8	0.008
27	169.65	-170	2150610.66	16931386.86	636.15	0.424	0.26139	31.7	0.498	0.008	0.00227	16.5	88.8	0.008
28	169.65	-165	2150615.47	16931385.52	636.15	0.445	0.27478	31.7	0.523	0.008	0.00234	16.4	88.8	0.008
29	169.65	-160	2150620.29	16931384.18	636.15	0.468	0.28926	31.7	0.55	0.008	0.00241	16.2	88.8	0.009
30	169.65	-155	2150625.11	16931382.84	636.15	0.493	0.30496	31.8	0.579	0.009	0.00247	16.1	88.8	0.009
31	169.65	-150	2150629.93	16931381.5	636.15	0.519	0.322	31.8	0.611	0.009	0.00253	15.9	88.9	0.009
32	169.65	-145	2150634.74	16931380.16	636.15	0.549	0.34055	31.8	0.646	0.009	0.00258	15.8	88.9	0.01
33	169.65	-140	2150639.56	16931378.82	636.15	0.58	0.36076	31.9	0.683	0.009	0.00263	15.5	89	0.01
34	169.65	-135	2150644.38	16931377.48	636.15	0.615	0.38284	31.9	0.724	0.01	0.00266	15.3	89	0.01
35	169.65	-130	2150649.19	16931376.14	636.15	0.652	0.40702	32	0.769	0.01	0.00268	15	89.1	0.01
36	169.65	-125	2150654.01	16931374.8	636.15	0.693	0.43354	32	0.817	0.01	0.00268	14.6	89.2	0.011
37	169.65	-120	2150658.83	16931373.46	636.15	0.738	0.46272	32.1	0.871	0.011	0.00266	14.1	89.4	0.011
38	169.65	-115	2150663.65	16931372.12	636.15	0.787	0.49487	32.2	0.929	0.011	0.00259	13.6	89.5	0.011
39	169.65	-110	2150668.46	16931370.78	636.15	0.84	0.5304	32.3	0.994	0.011	0.00249	12.9	89.8	0.011
40	169.65	-105	2150673.28	16931369.44	636.15	0.9	0.56975	32.3	1.065	0.011	0.00232	12	90.1	0.011
41	169.65	-100	2150678.1	16931368.1	636.15	0.965	0.61342	32.4	1.143	0.011	0.00208	10.8	90.4	0.011
42	169.65	-95	2150682.92	16931366.77	636.15	1.037	0.66202	32.6	1.23	0.011	0.00175	9.2	90.9	0.011
43	169.65	-90	2150687.73	16931365.43	636.15	1.116	0.7162	32.7	1.326	0.01	0.0013	7.1	91.6	0.011
44	169.65	-85	2150692.55	16931364.09	636.15	1.204	0.77674	32.8	1.433	0.01	0.00077	4.4	92.5	0.01
45	169.65	-80	2150697.37	16931362.75	636.15	1.301	0.8445	33	1.551	0.009	0.00063	4	93.7	0.009
46	169.65	-75	2150702.18	16931361.41	636.15	1.409	0.92045	33.2	1.683	0.008	0.00155	11	95	0.008
47	169.65	-70	2150707	16931360.07	636.15	1.529	1.00567	33.3	1.83	0.006	0.00299	25	95.4	0.007
48	169.65	-65	2150711.82	16931358.73	636.15	1.66	1.10132	33.6	1.993	0.004	0.0049	48.2	90	0.006
49	169.65	-60	2150716.64	16931357.39	636.15	1.806	1.20858	33.8	2.173	0.002	0.00738	72.5	78.8	0.007
50	169.65	-55	2150721.45	16931356.05	636.15	1.966	1.32863	34	2.373	0.003	0.01057	71.8	75.5	0.011
51	169.65	-50	2150726.27	16931354.71	636.15	2.142	1.46251	34.3	2.594	0.008	0.01462	62.2	76.5	0.016
52	169.65	-45	2150731.09	16931353.37	636.15	2.333	1.61088	34.6	2.835	0.013	0.01971	55.8	78	0.024



53	169.65	-40	2150735.9	16931352.03	636.15	2.538	1.77379	35	3.096	0.02	0.02599	52	79.4	0.033
54	169.65	-35	2150740.72	16931350.69	636.15	2.755	1.95023	35.3	3.376	0.029	0.0336	49.6	80.5	0.044
55	169.65	-30	2150745.54	16931349.35	636.15	2.981	2.13762	35.6	3.668	0.038	0.04256	48.1	81.6	0.057
56	169.65	-25	2150750.36	16931348.01	636.15	3.21	2.33121	36	3.967	0.049	0.05275	47.3	82.7	0.072
57	169.65	-20	2150755.17	16931346.67	636.15	3.432	2.52356	36.3	4.26	0.06	0.06378	46.9	83.8	0.087
58	169.65	-15	2150759.99	16931345.33	636.15	3.638	2.70435	36.6	4.533	0.071	0.07495	46.7	84.9	0.103
59	169.65	-10	2150764.81	16931343.99	636.15	3.813	2.86085	36.9	4.767	0.08	0.08523	46.7	86.2	0.117
60	169.65	-5	2150769.63	16931342.65	636.15	3.944	2.97945	37.1	4.943	0.088	0.09342	46.7	87.6	0.128
61	169.65	0	2150774.44	16931341.32	636.15	4.019	3.04805	37.2	5.044	0.092	0.09835	46.8	89	0.135
62	169.65	5	2150779.26	16931339.98	636.15	4.031	3.05889	37.2	5.06	0.093	0.09926	46.8	90.4	0.136
63	169.65	10	2150784.08	16931338.64	636.15	3.979	3.01068	37.1	4.989	0.09	0.09599	46.8	91.9	0.132
64	169.65	15	2150788.89	16931337.3	636.15	3.867	2.9089	37	4.839	0.084	0.08909	46.8	93.2	0.122
65	169.65	20	2150793.71	16931335.96	636.15	3.706	2.76435	36.7	4.623	0.075	0.07959	46.8	94.5	0.109
66	169.65	25	2150798.53	16931334.62	636.15	3.51	2.59041	36.4	4.362	0.064	0.06871	47	95.7	0.094
67	169.65	30	2150803.35	16931333.28	636.15	3.292	2.40042	36.1	4.074	0.053	0.05758	47.4	96.8	0.078
68	169.65	35	2150808.16	16931331.94	636.15	3.063	2.20572	35.8	3.775	0.042	0.04702	48.1	97.9	0.063
69	169.65	40	2150812.98	16931330.6	636.15	2.835	2.01485	35.4	3.478	0.032	0.03755	49.3	98.9	0.05
70	169.65	45	2150817.8	16931329.26	636.15	2.613	1.83353	35.1	3.192	0.024	0.02939	51.3	100	0.038
71	169.65	50	2150822.62	16931327.92	636.15	2.403	1.66509	34.7	2.923	0.016	0.02257	54.6	101.2	0.028
72	169.65	55	2150827.43	16931326.58	636.15	2.206	1.51103	34.4	2.674	0.01	0.01701	59.9	102.6	0.02
73	169.65	60	2150832.25	16931325.24	636.15	2.025	1.37166	34.1	2.445	0.005	0.01254	68.2	103.8	0.013
74	169.65	65	2150837.07	16931323.9	636.15	1.858	1.24647	33.9	2.238	0.002	0.00899	76.5	103	0.009
75	169.65	70	2150841.88	16931322.56	636.15	1.707	1.13454	33.6	2.05	0.003	0.00622	61.3	95.5	0.007
76	169.65	75	2150846.7	16931321.22	636.15	1.57	1.03471	33.4	1.88	0.006	0.00406	36.3	86.7	0.007
77	169.65	80	2150851.52	16931319.88	636.15	1.446	0.94577	33.2	1.728	0.007	0.0024	18.3	85	0.008
78	169.65	85	2150856.34	16931318.54	636.15	1.334	0.86656	33	1.591	0.009	0.00118	7.8	86	0.009
79	169.65	90	2150861.15	16931317.2	636.15	1.233	0.79594	32.8	1.468	0.01	0.00051	3.1	87.1	0.01
80	169.65	95	2150865.97	16931315.87	636.15	1.142	0.7329	32.7	1.357	0.01	0.00084	4.7	88.1	0.01
81	169.65	100	2150870.79	16931314.53	636.15	1.059	0.67655	32.6	1.257	0.011	0.00133	7.2	88.8	0.011
82	169.65	105	2150875.6	16931313.19	636.15	0.985	0.62606	32.4	1.167	0.011	0.00172	9.1	89.4	0.011
83	169.65	110	2150880.42	16931311.85	636.15	0.917	0.58074	32.3	1.086	0.011	0.00201	10.5	89.8	0.011
84	169.65	115	2150885.24	16931310.51	636.15	0.856	0.53996	32.2	1.012	0.011	0.00221	11.6	90.1	0.011
85	169.65	120	2150890.06	16931309.17	636.15	0.8	0.50318	32.2	0.945	0.011	0.00236	12.4	90.4	0.011
86	169.65	125	2150894.87	16931307.83	636.15	0.75	0.46993	32.1	0.885	0.01	0.00245	13.1	90.6	0.011
87	169.65	130	2150899.69	16931306.49	636.15	0.704	0.4398	32	0.83	0.01	0.0025	13.7	90.7	0.011
88	169.65	135	2150904.51	16931305.15	636.15	0.662	0.41243	31.9	0.78	0.01	0.00252	14.1	90.8	0.01
89	169.65	140	2150909.33	16931303.81	636.15	0.623	0.38752	31.9	0.734	0.01	0.00252	14.5	90.9	0.01
90	169.65	145	2150914.14	16931302.47	636.15	0.588	0.36479	31.8	0.692	0.009	0.00249	14.8	91	0.01
91	169.65	150	2150918.96	16931301.13	636.15	0.555	0.34401	31.8	0.653	0.009	0.00246	15	91.1	0.009
92	169.65	155	2150923.78	16931299.79	636.15	0.525	0.32497	31.7	0.618	0.009	0.00242	15.3	91.1	0.009
93	169.65	160	2150928.59	16931298.45	636.15	0.498	0.30749	31.7	0.585	0.009	0.00237	15.4	91.2	0.009
94	169.65	165	2150933.41	16931297.11	636.15	0.472	0.2914	31.7	0.555	0.008	0.00231	15.6	91.2	0.009
95	169.65	170	2150938.23	16931295.77	636.15	0.449	0.27657	31.6	0.527	0.008	0.00225	15.7	91.2	0.008
96	169.65	175	2150943.05	16931294.43	636.15	0.427	0.26287	31.6	0.501	0.008	0.00219	15.9	91.2	0.008
97	169.65	180	2150947.86	16931293.09	636.15	0.407	0.2502	31.6	0.478	0.007	0.00213	16	91.2	0.008
98	169.65	185	2150952.68	16931291.76	636.15	0.388	0.23846	31.6	0.455	0.007	0.00206	16.1	91.2	0.007
99	169.65	190	2150957.5	16931290.42	636.15	0.371	0.22755	31.5	0.435	0.007	0.002	16.2	91.2	0.007
100	169.65	195	2150962.32	16931289.08	636.15	0.354	0.21741	31.5	0.416	0.007	0.00194	16.2	91.2	0.007
101	169.65	200	2150967.13	16931287.74	636.15	0.339	0.20797	31.5	0.398	0.006	0.00188	16.3	91.2	0.007
102	169.65	205	2150971.95	16931286.4	636.15	0.325	0.19916	31.5	0.381	0.006	0.00182	16.4	91.2	0.006
103	169.65	210	2150976.77	16931285.06	636.15	0.312	0.19093	31.5	0.366	0.006	0.00176	16.4	91.2	0.006
104	169.65	215	2150981.58	16931283.72	636.15	0.299	0.18324	31.5	0.351	0.006	0.00171	16.5	91.2	0.006
105	169.65	220	2150986.4	16931282.38	636.15	0.288	0.17603	31.5	0.337	0.006	0.00165	16.5	91.2	0.006

106	169.65	225	2150991.22	16931281.04	636.15	0.277	0.16926	31.5	0.324	0.005	0.0016	16.5	91.2	0.006
107	169.65	230	2150996.04	16931279.7	636.15	0.266	0.16291	31.5	0.312	0.005	0.00155	16.6	91.2	0.005
108	169.65	235	2151000.85	16931278.36	636.15	0.257	0.15694	31.4	0.301	0.005	0.0015	16.6	91.2	0.005
109	169.65	240	2151005.67	16931277.02	636.15	0.247	0.15131	31.4	0.29	0.005	0.00145	16.6	91.1	0.005
110	169.65	245	2151010.49	16931275.68	636.15	0.239	0.14601	31.4	0.28	0.005	0.00141	16.7	91.1	0.005
111	169.65	250	2151015.3	16931274.34	636.15	0.231	0.14101	31.4	0.27	0.005	0.00136	16.7	91.1	0.005
112	169.65	255	2151020.12	16931273	636.15	0.223	0.13629	31.4	0.261	0.004	0.00132	16.7	91.1	0.005
113	169.65	260	2151024.94	16931271.66	636.15	0.216	0.13182	31.4	0.253	0.004	0.00128	16.7	91.1	0.004
114	169.65	265	2151029.76	16931270.32	636.15	0.209	0.1276	31.4	0.245	0.004	0.00124	16.8	91.1	0.004
115	169.65	270	2151034.57	16931268.98	636.15	0.202	0.12359	31.4	0.237	0.004	0.0012	16.8	91.1	0.004
116	169.65	275	2151039.39	16931267.64	636.15	0.196	0.11979	31.4	0.23	0.004	0.00117	16.8	91.1	0.004
117	169.65	280	2151044.21	16931266.31	636.15	0.19	0.11618	31.4	0.223	0.004	0.00113	16.8	91.1	0.004
118	169.65	285	2151049.03	16931264.97	636.15	0.184	0.11276	31.4	0.216	0.004	0.0011	16.8	91	0.004
119	169.65	290	2151053.84	16931263.63	636.15	0.179	0.1095	31.4	0.21	0.004	0.00107	16.8	91	0.004
120	169.65	295	2151058.66	16931262.29	636.15	0.174	0.1064	31.4	0.204	0.003	0.00104	16.9	91	0.004
121	169.65	300	2151063.48	16931260.95	636.15	0.169	0.10344	31.4	0.198	0.003	0.00101	16.9	91	0.003

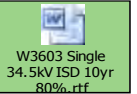
Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	37864.36	-300	2158063.64	16961510.89	931.31	0.184	0.10683	30.1	0.213	0.004	0.00105	13.8	88.9	0.004
2	37864.36	-295	2158068.64	16961510.9	931.31	0.191	0.11045	30.1	0.22	0.004	0.00109	13.8	88.9	0.005
3	37864.36	-290	2158073.64	16961510.92	931.31	0.197	0.11425	30.1	0.228	0.005	0.00112	13.8	88.9	0.005
4	37864.36	-285	2158078.64	16961510.93	931.31	0.204	0.11826	30.1	0.236	0.005	0.00116	13.8	88.9	0.005
5	37864.36	-280	2158083.64	16961510.94	931.31	0.211	0.12247	30.1	0.244	0.005	0.0012	13.8	88.8	0.005
6	37864.36	-275	2158088.64	16961510.96	931.31	0.219	0.12692	30.1	0.253	0.005	0.00124	13.7	88.8	0.005
7	37864.36	-270	2158093.64	16961510.97	931.31	0.227	0.1316	30.1	0.262	0.005	0.00128	13.7	88.8	0.005
8	37864.36	-265	2158098.64	16961510.98	931.31	0.235	0.13656	30.1	0.272	0.005	0.00133	13.7	88.8	0.006
9	37864.36	-260	2158103.64	16961510.99	931.31	0.244	0.14179	30.1	0.283	0.006	0.00137	13.7	88.8	0.006
10	37864.36	-255	2158108.64	16961511.01	931.31	0.254	0.14734	30.1	0.294	0.006	0.00142	13.7	88.7	0.006
11	37864.36	-250	2158113.64	16961511.02	931.31	0.264	0.15321	30.1	0.305	0.006	0.00148	13.7	88.7	0.006
12	37864.36	-245	2158118.64	16961511.03	931.31	0.275	0.15944	30.1	0.318	0.006	0.00153	13.7	88.7	0.006
13	37864.36	-240	2158123.64	16961511.05	931.31	0.286	0.16605	30.1	0.331	0.007	0.00159	13.7	88.7	0.007
14	37864.36	-235	2158128.64	16961511.06	931.31	0.298	0.17309	30.1	0.345	0.007	0.00165	13.7	88.7	0.007
15	37864.36	-230	2158133.64	16961511.07	931.31	0.311	0.18057	30.2	0.359	0.007	0.00171	13.7	88.6	0.007
16	37864.36	-225	2158138.64	16961511.08	931.31	0.324	0.18855	30.2	0.375	0.007	0.00178	13.6	88.6	0.008
17	37864.36	-220	2158143.64	16961511.1	931.31	0.339	0.19707	30.2	0.392	0.008	0.00186	13.6	88.6	0.008
18	37864.36	-215	2158148.64	16961511.11	931.31	0.355	0.20618	30.2	0.41	0.008	0.00193	13.6	88.6	0.008
19	37864.36	-210	2158153.64	16961511.12	931.31	0.371	0.21592	30.2	0.429	0.008	0.00201	13.6	88.5	0.009
20	37864.36	-205	2158158.64	16961511.14	931.31	0.389	0.22637	30.2	0.45	0.009	0.0021	13.6	88.5	0.009
21	37864.36	-200	2158163.64	16961511.15	931.31	0.408	0.23759	30.2	0.472	0.009	0.00219	13.6	88.5	0.009
22	37864.36	-195	2158168.64	16961511.16	931.31	0.429	0.24966	30.2	0.496	0.01	0.00229	13.5	88.4	0.01
23	37864.36	-190	2158173.64	16961511.17	931.31	0.451	0.26267	30.2	0.522	0.01	0.00239	13.5	88.4	0.01
24	37864.36	-185	2158178.64	16961511.19	931.31	0.475	0.27671	30.2	0.55	0.01	0.0025	13.5	88.4	0.011
25	37864.36	-180	2158183.64	16961511.2	931.31	0.501	0.29189	30.2	0.579	0.011	0.00262	13.5	88.4	0.011
26	37864.36	-175	2158188.64	16961511.21	931.31	0.528	0.30835	30.3	0.612	0.011	0.00274	13.4	88.3	0.012
27	37864.36	-170	2158193.64	16961511.23	931.31	0.559	0.32623	30.3	0.647	0.012	0.00287	13.4	88.3	0.012
28	37864.36	-165	2158198.64	16961511.24	931.31	0.592	0.34569	30.3	0.685	0.013	0.00301	13.3	88.3	0.013
29	37864.36	-160	2158203.64	16961511.25	931.31	0.628	0.36692	30.3	0.727	0.013	0.00315	13.3	88.2	0.014
30	37864.36	-155	2158208.64	16961511.26	931.31	0.667	0.39015	30.3	0.773	0.014	0.00331	13.2	88.2	0.014
31	37864.36	-150	2158213.64	16961511.28	931.31	0.71	0.41562	30.4	0.822	0.015	0.00348	13.2	88.2	0.015
32	37864.36	-145	2158218.64	16961511.29	931.31	0.757	0.44364	30.4	0.877	0.016	0.00365	13.1	88.1	0.016
33	37864.36	-140	2158223.64	16961511.3	931.31	0.809	0.47454	30.4	0.938	0.017	0.00383	13	88.1	0.017
34	37864.36	-135	2158228.64	16961511.32	931.31	0.866	0.50873	30.4	1.004	0.017	0.00403	13	88.1	0.018
35	37864.36	-130	2158233.64	16961511.33	931.31	0.929	0.54669	30.5	1.078	0.019	0.00423	12.9	88.1	0.019
36	37864.36	-125	2158238.64	16961511.34	931.31	1	0.58897	30.5	1.161	0.02	0.00444	12.7	88	0.02
37	37864.36	-120	2158243.64	16961511.35	931.31	1.079	0.63625	30.5	1.252	0.021	0.00465	12.6	88	0.021
38	37864.36	-115	2158248.64	16961511.37	931.31	1.166	0.68932	30.6	1.355	0.022	0.00486	12.4	88	0.023
39	37864.36	-110	2158253.64	16961511.38	931.31	1.265	0.74915	30.6	1.47	0.023	0.00507	12.2	88	0.024
40	37864.36	-105	2158258.64	16961511.39	931.31	1.377	0.81689	30.7	1.601	0.025	0.00526	12	88.1	0.025
41	37864.36	-100	2158263.64	16961511.41	931.31	1.503	0.89396	30.8	1.748	0.026	0.00543	11.7	88.1	0.027
42	37864.36	-95	2158268.64	16961511.42	931.31	1.646	0.98208	30.8	1.917	0.028	0.00555	11.3	88.2	0.028
43	37864.36	-90	2158273.64	16961511.43	931.31	1.81	1.08337	30.9	2.109	0.029	0.0056	10.9	88.3	0.03
44	37864.36	-85	2158278.64	16961511.44	931.31	1.998	1.20047	31	2.331	0.031	0.00554	10.2	88.5	0.031
45	37864.36	-80	2158283.64	16961511.46	931.31	2.215	1.33665	31.1	2.587	0.032	0.00532	9.4	88.8	0.032
46	37864.36	-75	2158288.64	16961511.47	931.31	2.467	1.49602	31.2	2.885	0.033	0.00485	8.3	89.2	0.033
47	37864.36	-70	2158293.64	16961511.48	931.31	2.76	1.68372	31.4	3.233	0.034	0.00402	6.8	89.8	0.034
48	37864.36	-65	2158298.64	16961511.5	931.31	3.103	1.90625	31.6	3.642	0.034	0.00275	4.6	90.6	0.034
49	37864.36	-60	2158303.64	16961511.51	931.31	3.507	2.1718	31.8	4.125	0.033	0.00177	3.1	91.9	0.033
50	37864.36	-55	2158308.64	16961511.52	931.31	3.984	2.49062	32	4.699	0.03	0.00433	8.1	93.8	0.03
51	37864.36	-50	2158313.64	16961511.54	931.31	4.549	2.8754	32.3	5.381	0.025	0.0098	21.1	95.6	0.027
52	37864.36	-45	2158318.64	16961511.55	931.31	5.217	3.34138	32.6	6.196	0.018	0.01833	46.1	90.2	0.024
53	37864.36	-40	2158323.64	16961511.56	931.31	6.007	3.90589	33	7.165	0.011	0.0312	71.3	72.3	0.031
54	37864.36	-35	2158328.64	16961511.57	931.31	6.931	4.58637	33.5	8.311	0.023	0.05023	65	70.3	0.055
55	37864.36	-30	2158333.64	16961511.59	931.31	7.995	5.39546	34	9.645	0.052	0.07763	56.3	72.8	0.093
56	37864.36	-25	2158338.64	16961511.6	931.31	9.184	6.331	34.6	11.155	0.091	0.11551	51.6	75.4	0.147
57	37864.36	-20	2158343.64	16961511.61	931.31	10.449	7.35981	35.2	12.781	0.141	0.16455	49.4	78	0.217
58	37864.36	-15	2158348.64	16961511.63	931.31	11.692	8.39947	35.7	14.397	0.197	0.22173	48.4	80.6	0.296



59	37864.36	-10	2158353.64	16961511.64	931.31	12.763	9.31412	36.1	15.8	0.25	0.27839	48.1	83.5	0.374
60	37864.36	-5	2158358.64	16961511.65	931.31	13.493	9.94526	36.4	16.762	0.289	0.32108	48	86.7	0.432
61	37864.36	0	2158363.64	16961511.66	931.31	13.752	10.1701	36.5	17.104	0.303	0.33705	48	90	0.453
62	37864.36	5	2158368.64	16961511.68	931.31	13.492	9.94438	36.4	16.761	0.289	0.32106	48	93.3	0.432
63	37864.36	10	2158373.64	16961511.69	931.31	12.761	9.31273	36.1	15.798	0.25	0.27837	48.1	96.5	0.374
64	37864.36	15	2158378.64	16961511.7	931.31	11.691	8.39799	35.7	14.394	0.197	0.22172	48.4	99.4	0.296
65	37864.36	20	2158383.64	16961511.72	931.31	10.448	7.35854	35.2	12.779	0.141	0.16455	49.4	102	0.217
66	37864.36	25	2158388.64	16961511.73	931.31	9.183	6.33001	34.6	11.153	0.091	0.11552	51.6	104.6	0.147
67	37864.36	30	2158393.64	16961511.74	931.31	7.994	5.39474	34	9.644	0.052	0.07764	56.3	107.2	0.093
68	37864.36	35	2158398.64	16961511.75	931.31	6.93	4.58586	33.5	8.31	0.023	0.05025	65	109.7	0.055
69	37864.36	40	2158403.64	16961511.77	931.31	6.006	3.90553	33	7.164	0.011	0.03122	71.3	107.7	0.031
70	37864.36	45	2158408.64	16961511.78	931.31	5.217	3.34113	32.6	6.195	0.018	0.01835	46.1	89.8	0.024
71	37864.36	50	2158413.64	16961511.79	931.31	4.549	2.87522	32.3	5.381	0.025	0.00981	21.2	84.4	0.027
72	37864.36	55	2158418.64	16961511.81	931.31	3.984	2.49049	32	4.698	0.03	0.00434	8.2	86.2	0.03
73	37864.36	60	2158423.64	16961511.82	931.31	3.507	2.17171	31.8	4.125	0.033	0.00177	3.1	88.1	0.033
74	37864.36	65	2158428.64	16961511.83	931.31	3.103	1.90618	31.6	3.642	0.034	0.00274	4.6	89.4	0.034
75	37864.36	70	2158433.64	16961511.84	931.31	2.76	1.68367	31.4	3.233	0.034	0.00401	6.8	90.2	0.034
76	37864.36	75	2158438.64	16961511.86	931.31	2.466	1.49598	31.2	2.885	0.033	0.00484	8.3	90.8	0.033
77	37864.36	80	2158443.64	16961511.87	931.31	2.215	1.33662	31.1	2.587	0.032	0.00531	9.4	91.2	0.032
78	37864.36	85	2158448.64	16961511.88	931.31	1.998	1.20045	31	2.331	0.031	0.00554	10.2	91.5	0.031
79	37864.36	90	2158453.64	16961511.9	931.31	1.81	1.08335	30.9	2.109	0.029	0.0056	10.9	91.7	0.03
80	37864.36	95	2158458.64	16961511.91	931.31	1.646	0.98206	30.8	1.917	0.028	0.00555	11.3	91.8	0.028
81	37864.36	100	2158463.64	16961511.92	931.31	1.503	0.89395	30.8	1.748	0.026	0.00542	11.7	91.9	0.027
82	37864.36	105	2158468.64	16961511.93	931.31	1.377	0.81688	30.7	1.601	0.025	0.00526	12	91.9	0.025
83	37864.36	110	2158473.64	16961511.95	931.31	1.265	0.74914	30.6	1.47	0.023	0.00506	12.2	92	0.024
84	37864.36	115	2158478.64	16961511.96	931.31	1.166	0.68932	30.6	1.355	0.022	0.00486	12.4	92	0.023
85	37864.36	120	2158483.64	16961511.97	931.31	1.079	0.63625	30.5	1.252	0.021	0.00465	12.6	92	0.021
86	37864.36	125	2158488.64	16961511.99	931.31	1	0.58897	30.5	1.161	0.02	0.00443	12.7	92	0.02
87	37864.36	130	2158493.64	16961512	931.31	0.929	0.54669	30.5	1.078	0.019	0.00423	12.9	91.9	0.019
88	37864.36	135	2158498.64	16961512.01	931.31	0.866	0.50873	30.4	1.004	0.017	0.00403	13	91.9	0.018
89	37864.36	140	2158503.64	16961512.02	931.31	0.809	0.47454	30.4	0.938	0.017	0.00383	13	91.9	0.017
90	37864.36	145	2158508.64	16961512.04	931.31	0.757	0.44364	30.4	0.877	0.016	0.00365	13.1	91.9	0.016
91	37864.36	150	2158513.64	16961512.05	931.31	0.71	0.41562	30.4	0.822	0.015	0.00348	13.2	91.8	0.015
92	37864.36	155	2158518.64	16961512.06	931.31	0.667	0.39015	30.3	0.773	0.014	0.00331	13.2	91.8	0.014
93	37864.36	160	2158523.64	16961512.08	931.31	0.628	0.36692	30.3	0.727	0.013	0.00315	13.3	91.8	0.014
94	37864.36	165	2158528.64	16961512.09	931.31	0.592	0.34569	30.3	0.685	0.013	0.00301	13.3	91.7	0.013
95	37864.36	170	2158533.64	16961512.1	931.31	0.559	0.32623	30.3	0.647	0.012	0.00287	13.4	91.7	0.012
96	37864.36	175	2158538.64	16961512.11	931.31	0.528	0.30835	30.3	0.612	0.011	0.00274	13.4	91.7	0.012
97	37864.36	180	2158543.64	16961512.13	931.31	0.501	0.29189	30.2	0.579	0.011	0.00261	13.5	91.6	0.011
98	37864.36	185	2158548.64	16961512.14	931.31	0.475	0.27671	30.2	0.55	0.01	0.0025	13.5	91.6	0.011
99	37864.36	190	2158553.64	16961512.15	931.31	0.451	0.26267	30.2	0.522	0.01	0.00239	13.5	91.6	0.01
100	37864.36	195	2158558.64	16961512.17	931.31	0.429	0.24966	30.2	0.496	0.01	0.00229	13.5	91.6	0.01
101	37864.36	200	2158563.64	16961512.18	931.31	0.408	0.23759	30.2	0.472	0.009	0.00219	13.6	91.5	0.009
102	37864.36	205	2158568.64	16961512.19	931.31	0.389	0.22637	30.2	0.45	0.009	0.0021	13.6	91.5	0.009
103	37864.36	210	2158573.64	16961512.2	931.31	0.371	0.21592	30.2	0.429	0.008	0.00201	13.6	91.5	0.009
104	37864.36	215	2158578.64	16961512.22	931.31	0.355	0.20618	30.2	0.41	0.008	0.00193	13.6	91.4	0.008
105	37864.36	220	2158583.64	16961512.23	931.31	0.339	0.19707	30.2	0.392	0.008	0.00186	13.6	91.4	0.008
106	37864.36	225	2158588.64	16961512.24	931.31	0.324	0.18855	30.2	0.375	0.007	0.00178	13.6	91.4	0.008
107	37864.36	230	2158593.64	16961512.26	931.31	0.311	0.18057	30.2	0.359	0.007	0.00171	13.7	91.4	0.007
108	37864.36	235	2158598.64	16961512.27	931.31	0.298	0.17309	30.1	0.345	0.007	0.00165	13.7	91.3	0.007
109	37864.36	240	2158603.64	16961512.28	931.31	0.286	0.16605	30.1	0.331	0.007	0.00159	13.7	91.3	0.007
110	37864.36	245	2158608.64	16961512.29	931.31	0.275	0.15944	30.1	0.318	0.006	0.00153	13.7	91.3	0.006
111	37864.36	250	2158613.64	16961512.31	931.31	0.264	0.15321	30.1	0.305	0.006	0.00148	13.7	91.3	0.006
112	37864.36	255	2158618.64	16961512.32	931.31	0.254	0.14734	30.1	0.294	0.006	0.00142	13.7	91.3	0.006
113	37864.36	260	2158623.64	16961512.33	931.31	0.244	0.14179	30.1	0.283	0.006	0.00137	13.7	91.2	0.006
114	37864.36	265	2158628.64	16961512.35	931.31	0.235	0.13656	30.1	0.272	0.005	0.00133	13.7	91.2	0.006
115	37864.36	270	2158633.64	16961512.36	931.31	0.227	0.1316	30.1	0.262	0.005	0.00128	13.7	91.2	0.005
116	37864.36	275	2158638.64	16961512.37	931.31	0.219	0.12692	30.1	0.253	0.005	0.00124	13.7	91.2	0.005
117	37864.36	280	2158643.64	16961512.38	931.31	0.211	0.12247	30.1	0.244	0.005	0.0012	13.8	91.2	0.005

118	37864.36	285	2158648.64	16961512.4	931.31	0.204	0.11826	30.1	0.236	0.005	0.00116	13.8	91.1	0.005
119	37864.36	290	2158653.64	16961512.41	931.31	0.197	0.11425	30.1	0.228	0.005	0.00112	13.8	91.1	0.005
120	37864.36	295	2158658.64	16961512.42	931.31	0.191	0.11045	30.1	0.22	0.004	0.00109	13.8	91.1	0.005
121	37864.36	300	2158663.64	16961512.44	931.31	0.184	0.10683	30.1	0.213	0.004	0.00105	13.8	91.1	0.004

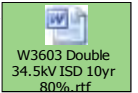
Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	50304.52	-300	2174877.09	17012818.16	884.9	0.134	0.07466	29.2	0.153	0.003	0.00084	17.4	88.9	0.003
2	50304.52	-295	2174880.12	17012814.18	884.9	0.138	0.07709	29.2	0.158	0.003	0.00087	17.4	88.9	0.003
3	50304.52	-290	2174883.16	17012810.2	884.9	0.143	0.07965	29.2	0.163	0.003	0.0009	17.3	88.9	0.003
4	50304.52	-285	2174886.19	17012806.23	884.9	0.147	0.08235	29.2	0.169	0.003	0.00093	17.3	88.9	0.003
5	50304.52	-280	2174889.22	17012802.25	884.9	0.152	0.08518	29.2	0.175	0.003	0.00096	17.3	88.8	0.003
6	50304.52	-275	2174892.25	17012798.27	884.9	0.158	0.08817	29.2	0.181	0.003	0.00099	17.3	88.8	0.003
7	50304.52	-270	2174895.28	17012794.3	884.9	0.163	0.09132	29.2	0.187	0.003	0.00103	17.3	88.8	0.003
8	50304.52	-265	2174898.31	17012790.32	884.9	0.169	0.09465	29.3	0.194	0.003	0.00106	17.3	88.8	0.004
9	50304.52	-260	2174901.34	17012786.34	884.9	0.175	0.09816	29.3	0.201	0.004	0.0011	17.3	88.8	0.004
10	50304.52	-255	2174904.37	17012782.37	884.9	0.182	0.10188	29.3	0.208	0.004	0.00114	17.3	88.8	0.004
11	50304.52	-250	2174907.4	17012778.39	884.9	0.189	0.10581	29.3	0.216	0.004	0.00118	17.3	88.7	0.004
12	50304.52	-245	2174910.43	17012774.41	884.9	0.196	0.10999	29.3	0.225	0.004	0.00123	17.3	88.7	0.004
13	50304.52	-240	2174913.47	17012770.44	884.9	0.204	0.11442	29.3	0.234	0.004	0.00127	17.3	88.7	0.004
14	50304.52	-235	2174916.5	17012766.46	884.9	0.212	0.11913	29.3	0.243	0.004	0.00132	17.3	88.7	0.004
15	50304.52	-230	2174919.53	17012762.48	884.9	0.221	0.12413	29.4	0.253	0.004	0.00138	17.3	88.6	0.005
16	50304.52	-225	2174922.56	17012758.51	884.9	0.23	0.12947	29.4	0.264	0.005	0.00143	17.3	88.6	0.005
17	50304.52	-220	2174925.59	17012754.53	884.9	0.24	0.13516	29.4	0.275	0.005	0.00149	17.3	88.6	0.005
18	50304.52	-215	2174928.62	17012750.55	884.9	0.251	0.14123	29.4	0.288	0.005	0.00155	17.3	88.6	0.005
19	50304.52	-210	2174931.65	17012746.58	884.9	0.262	0.14774	29.4	0.301	0.005	0.00162	17.3	88.5	0.005
20	50304.52	-205	2174934.68	17012742.6	884.9	0.274	0.1547	29.4	0.315	0.005	0.00169	17.3	88.5	0.006
21	50304.52	-200	2174937.71	17012738.62	884.9	0.287	0.16217	29.5	0.33	0.006	0.00176	17.3	88.5	0.006
22	50304.52	-195	2174940.74	17012734.65	884.9	0.301	0.17021	29.5	0.346	0.006	0.00184	17.3	88.5	0.006
23	50304.52	-190	2174943.77	17012730.67	884.9	0.316	0.17885	29.5	0.363	0.006	0.00193	17.3	88.4	0.006
24	50304.52	-185	2174946.81	17012726.69	884.9	0.332	0.18818	29.5	0.382	0.006	0.00202	17.3	88.4	0.007
25	50304.52	-180	2174949.84	17012722.72	884.9	0.35	0.19826	29.5	0.402	0.007	0.00212	17.3	88.4	0.007
26	50304.52	-175	2174952.87	17012718.74	884.9	0.369	0.20917	29.6	0.424	0.007	0.00222	17.2	88.3	0.007
27	50304.52	-170	2174955.9	17012714.76	884.9	0.389	0.22101	29.6	0.448	0.008	0.00233	17.2	88.3	0.008
28	50304.52	-165	2174958.93	17012710.79	884.9	0.412	0.23389	29.6	0.473	0.008	0.00245	17.2	88.3	0.008
29	50304.52	-160	2174961.96	17012706.81	884.9	0.436	0.24792	29.6	0.501	0.008	0.00257	17.2	88.2	0.009
30	50304.52	-155	2174964.99	17012702.83	884.9	0.462	0.26325	29.7	0.532	0.009	0.00271	17.2	88.2	0.009
31	50304.52	-150	2174968.02	17012698.86	884.9	0.491	0.28005	29.7	0.565	0.009	0.00285	17.2	88.2	0.01
32	50304.52	-145	2174971.05	17012694.88	884.9	0.523	0.2985	29.7	0.602	0.01	0.00301	17.2	88.1	0.01
33	50304.52	-140	2174974.08	17012690.9	884.9	0.558	0.31882	29.8	0.642	0.01	0.00317	17.1	88.1	0.011
34	50304.52	-135	2174977.12	17012686.93	884.9	0.596	0.34127	29.8	0.687	0.011	0.00335	17.1	88.1	0.011
35	50304.52	-130	2174980.15	17012682.95	884.9	0.639	0.36615	29.8	0.736	0.012	0.00353	17.1	88	0.012
36	50304.52	-125	2174983.18	17012678.97	884.9	0.686	0.39383	29.9	0.791	0.012	0.00373	17	88	0.013
37	50304.52	-120	2174986.21	17012675	884.9	0.738	0.42473	29.9	0.852	0.013	0.00395	17	88	0.014
38	50304.52	-115	2174989.24	17012671.02	884.9	0.797	0.45934	30	0.92	0.014	0.00417	16.9	88	0.014
39	50304.52	-110	2174992.27	17012667.05	884.9	0.862	0.49829	30	0.996	0.015	0.0044	16.9	88	0.015
40	50304.52	-105	2174995.3	17012663.07	884.9	0.936	0.54231	30.1	1.082	0.015	0.00465	16.8	88	0.016
41	50304.52	-100	2174998.33	17012659.09	884.9	1.019	0.59228	30.2	1.179	0.016	0.00489	16.7	88	0.017
42	50304.52	-95	2175001.36	17012655.12	884.9	1.114	0.64929	30.2	1.289	0.017	0.00514	16.5	88.1	0.018
43	50304.52	-90	2175004.39	17012651.14	884.9	1.221	0.71468	30.3	1.415	0.018	0.00537	16.3	88.2	0.019
44	50304.52	-85	2175007.43	17012647.16	884.9	1.345	0.7901	30.4	1.56	0.019	0.00557	16.1	88.3	0.02
45	50304.52	-80	2175010.46	17012643.19	884.9	1.487	0.87761	30.6	1.726	0.02	0.00573	15.8	88.5	0.021
46	50304.52	-75	2175013.49	17012639.21	884.9	1.651	0.97979	30.7	1.92	0.021	0.00579	15.3	88.8	0.022
47	50304.52	-70	2175016.52	17012635.23	884.9	1.841	1.09989	30.9	2.145	0.022	0.00572	14.7	89.2	0.023
48	50304.52	-65	2175019.55	17012631.26	884.9	2.064	1.24204	31	2.409	0.022	0.00543	13.7	89.9	0.023
49	50304.52	-60	2175022.58	17012627.28	884.9	2.326	1.41148	31.3	2.721	0.022	0.00481	12.2	91	0.023
50	50304.52	-55	2175025.61	17012623.3	884.9	2.635	1.61489	31.5	3.09	0.021	0.00372	9.9	92.7	0.022
51	50304.52	-50	2175028.64	17012619.33	884.9	3.001	1.86078	31.8	3.531	0.019	0.00223	6.6	95.5	0.019
52	50304.52	-45	2175031.67	17012615.35	884.9	3.435	2.15984	32.2	4.058	0.016	0.00306	11	100.2	0.016



53	50304.52	-40	2175034.7	17012611.37	884.9	3.952	2.52522	32.6	4.69	0.01	0.008	37.7	100	0.012
54	50304.52	-35	2175037.73	17012607.4	884.9	4.565	2.97239	33.1	5.447	0.007	0.01625	65.3	62.3	0.017
55	50304.52	-30	2175040.77	17012603.42	884.9	5.286	3.51779	33.6	6.349	0.019	0.02888	56.6	66.8	0.034
56	50304.52	-25	2175043.8	17012599.44	884.9	6.121	4.17496	34.3	7.409	0.04	0.0475	50	71.5	0.062
57	50304.52	-20	2175046.83	17012595.47	884.9	7.058	4.94563	35	8.618	0.068	0.07361	47.2	74.9	0.1
58	50304.52	-15	2175049.86	17012591.49	884.9	8.057	5.80318	35.8	9.929	0.103	0.10756	46.2	77.8	0.149
59	50304.52	-10	2175052.89	17012587.51	884.9	9.025	6.66944	36.5	11.222	0.141	0.14644	46.1	80.9	0.203
60	50304.52	-5	2175055.92	17012583.54	884.9	9.813	7.39958	37	12.29	0.174	0.18232	46.3	84.4	0.252
61	50304.52	0	2175058.95	17012579.56	884.9	10.244	7.81001	37.3	12.882	0.194	0.20337	46.4	88.3	0.281
62	50304.52	5	2175061.98	17012575.58	884.9	10.198	7.76975	37.3	12.821	0.192	0.20063	46.3	92.4	0.278
63	50304.52	10	2175065.01	17012571.61	884.9	9.688	7.29269	37	12.126	0.17	0.17523	45.9	96.3	0.244
64	50304.52	15	2175068.04	17012567.63	884.9	8.852	6.52679	36.4	10.998	0.135	0.13747	45.5	99.7	0.193
65	50304.52	20	2175071.08	17012563.65	884.9	7.869	5.65377	35.7	9.689	0.097	0.09882	45.4	102.8	0.139
66	50304.52	25	2175074.11	17012559.68	884.9	6.876	4.80724	35	8.39	0.064	0.06622	46.2	105.8	0.092
67	50304.52	30	2175077.14	17012555.7	884.9	5.955	4.05496	34.3	7.205	0.036	0.04169	48.8	109.6	0.055
68	50304.52	35	2175080.17	17012551.72	884.9	5.141	3.41724	33.6	6.173	0.017	0.02451	55.3	115.4	0.03
69	50304.52	40	2175083.2	17012547.75	884.9	4.44	2.88945	33.1	5.298	0.007	0.01303	61.8	121.9	0.013
70	50304.52	45	2175086.23	17012543.77	884.9	3.846	2.45716	32.6	4.564	0.011	0.00575	28	72.8	0.011
71	50304.52	50	2175089.26	17012539.79	884.9	3.346	2.10394	32.2	3.952	0.016	0.00222	7.9	79.7	0.016
72	50304.52	55	2175092.29	17012535.82	884.9	2.925	1.81466	31.8	3.442	0.019	0.00323	9.5	84.8	0.019
73	50304.52	60	2175095.32	17012531.84	884.9	2.57	1.57658	31.5	3.015	0.021	0.0047	12.6	87.5	0.022
74	50304.52	65	2175098.35	17012527.86	884.9	2.271	1.37942	31.3	2.657	0.022	0.0056	14.4	89.2	0.023
75	50304.52	70	2175101.39	17012523.89	884.9	2.017	1.21501	31.1	2.354	0.022	0.00606	15.5	90.2	0.023
76	50304.52	75	2175104.42	17012519.91	884.9	1.8	1.07692	30.9	2.098	0.021	0.00622	16.2	90.8	0.022
77	50304.52	80	2175107.45	17012515.93	884.9	1.615	0.96012	30.7	1.879	0.021	0.0062	16.7	91.2	0.022
78	50304.52	85	2175110.48	17012511.96	884.9	1.455	0.86064	30.6	1.691	0.02	0.00605	17	91.5	0.021
79	50304.52	90	2175113.51	17012507.98	884.9	1.317	0.77536	30.5	1.528	0.019	0.00584	17.2	91.7	0.02
80	50304.52	95	2175116.54	17012504.01	884.9	1.197	0.70179	30.4	1.388	0.018	0.00559	17.3	91.8	0.019
81	50304.52	100	2175119.57	17012500.03	884.9	1.092	0.63795	30.3	1.265	0.017	0.00532	17.4	91.9	0.018
82	50304.52	105	2175122.6	17012496.05	884.9	1	0.58224	30.2	1.157	0.016	0.00504	17.5	92	0.017
83	50304.52	110	2175125.63	17012492.08	884.9	0.918	0.53338	30.1	1.062	0.015	0.00477	17.5	92	0.016
84	50304.52	115	2175128.66	17012488.1	884.9	0.846	0.4903	30.1	0.978	0.014	0.00451	17.6	92	0.015
85	50304.52	120	2175131.69	17012484.12	884.9	0.782	0.45216	30	0.904	0.013	0.00426	17.6	92	0.014
86	50304.52	125	2175134.73	17012480.15	884.9	0.725	0.41825	30	0.837	0.013	0.00402	17.6	92	0.013
87	50304.52	130	2175137.76	17012476.17	884.9	0.674	0.38796	29.9	0.778	0.012	0.0038	17.6	92	0.013
88	50304.52	135	2175140.79	17012472.19	884.9	0.628	0.36081	29.9	0.724	0.011	0.00359	17.6	91.9	0.012
89	50304.52	140	2175143.82	17012468.22	884.9	0.586	0.33638	29.9	0.676	0.011	0.0034	17.7	91.9	0.011
90	50304.52	145	2175146.85	17012464.24	884.9	0.548	0.31434	29.8	0.632	0.01	0.00321	17.7	91.9	0.011
91	50304.52	150	2175149.88	17012460.26	884.9	0.514	0.29438	29.8	0.593	0.01	0.00304	17.7	91.9	0.01
92	50304.52	155	2175152.91	17012456.29	884.9	0.483	0.27625	29.8	0.557	0.009	0.00288	17.7	91.8	0.01
93	50304.52	160	2175155.94	17012452.31	884.9	0.455	0.25974	29.7	0.524	0.009	0.00273	17.7	91.8	0.009
94	50304.52	165	2175158.97	17012448.33	884.9	0.429	0.24466	29.7	0.494	0.008	0.0026	17.7	91.8	0.009
95	50304.52	170	2175162	17012444.36	884.9	0.405	0.23085	29.7	0.466	0.008	0.00247	17.6	91.7	0.008
96	50304.52	175	2175165.04	17012440.38	884.9	0.383	0.21818	29.7	0.441	0.007	0.00235	17.6	91.7	0.008
97	50304.52	180	2175168.07	17012436.4	884.9	0.363	0.20653	29.6	0.418	0.007	0.00223	17.6	91.7	0.007
98	50304.52	185	2175171.1	17012432.43	884.9	0.344	0.19578	29.6	0.396	0.007	0.00213	17.6	91.6	0.007
99	50304.52	190	2175174.13	17012428.45	884.9	0.327	0.18585	29.6	0.376	0.006	0.00203	17.6	91.6	0.007
100	50304.52	195	2175177.16	17012424.47	884.9	0.311	0.17667	29.6	0.358	0.006	0.00194	17.6	91.6	0.006
101	50304.52	200	2175180.19	17012420.5	884.9	0.296	0.16815	29.6	0.341	0.006	0.00185	17.6	91.5	0.006
102	50304.52	205	2175183.22	17012416.52	884.9	0.283	0.16023	29.5	0.325	0.006	0.00177	17.6	91.5	0.006
103	50304.52	210	2175186.25	17012412.54	884.9	0.27	0.15286	29.5	0.31	0.005	0.00169	17.6	91.5	0.006
104	50304.52	215	2175189.28	17012408.57	884.9	0.258	0.146	29.5	0.296	0.005	0.00162	17.6	91.5	0.005
105	50304.52	220	2175192.31	17012404.59	884.9	0.247	0.13959	29.5	0.283	0.005	0.00156	17.6	91.4	0.005

106	50304.52	225	2175195.35	17012400.61	884.9	0.236	0.13359	29.5	0.271	0.005	0.00149	17.6	91.4	0.005
107	50304.52	230	2175198.38	17012396.64	884.9	0.226	0.12798	29.5	0.26	0.005	0.00143	17.6	91.4	0.005
108	50304.52	235	2175201.41	17012392.66	884.9	0.217	0.12272	29.5	0.25	0.004	0.00138	17.6	91.4	0.005
109	50304.52	240	2175204.44	17012388.68	884.9	0.209	0.11778	29.4	0.24	0.004	0.00132	17.6	91.3	0.004
110	50304.52	245	2175207.47	17012384.71	884.9	0.201	0.11313	29.4	0.23	0.004	0.00127	17.6	91.3	0.004
111	50304.52	250	2175210.5	17012380.73	884.9	0.193	0.10876	29.4	0.221	0.004	0.00123	17.6	91.3	0.004
112	50304.52	255	2175213.53	17012376.75	884.9	0.186	0.10464	29.4	0.213	0.004	0.00118	17.6	91.3	0.004
113	50304.52	260	2175216.56	17012372.78	884.9	0.179	0.10076	29.4	0.205	0.004	0.00114	17.6	91.2	0.004
114	50304.52	265	2175219.59	17012368.8	884.9	0.172	0.09709	29.4	0.198	0.003	0.0011	17.6	91.2	0.004
115	50304.52	270	2175222.62	17012364.82	884.9	0.166	0.09362	29.4	0.191	0.003	0.00106	17.6	91.2	0.004
116	50304.52	275	2175225.65	17012360.85	884.9	0.161	0.09033	29.4	0.184	0.003	0.00102	17.6	91.2	0.003
117	50304.52	280	2175228.69	17012356.87	884.9	0.155	0.08722	29.4	0.178	0.003	0.00099	17.6	91.2	0.003
118	50304.52	285	2175231.72	17012352.89	884.9	0.15	0.08427	29.3	0.172	0.003	0.00096	17.6	91.1	0.003
119	50304.52	290	2175234.75	17012348.92	884.9	0.145	0.08147	29.3	0.166	0.003	0.00092	17.6	91.1	0.003
120	50304.52	295	2175237.78	17012344.94	884.9	0.14	0.07882	29.3	0.161	0.003	0.00089	17.6	91.1	0.003
121	50304.52	300	2175240.81	17012340.97	884.9	0.136	0.07629	29.3	0.156	0.003	0.00087	17.6	91.1	0.003

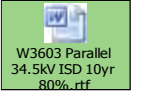
Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	11754.53	-300	2165527.8	16978343.73	789.3	0.223	0.12941	30.1	0.258	0.004	0.00102	13.3	88.9	0.004
2	11754.53	-295	2165532.8	16978343.85	789.3	0.231	0.13378	30.1	0.267	0.004	0.00105	13.3	88.9	0.005
3	11754.53	-290	2165537.8	16978343.97	789.3	0.239	0.13838	30.1	0.276	0.005	0.00108	13.3	88.9	0.005
4	11754.53	-285	2165542.79	16978344.08	789.3	0.247	0.14322	30.1	0.286	0.005	0.00112	13.3	88.9	0.005
5	11754.53	-280	2165547.79	16978344.2	789.3	0.256	0.14832	30.1	0.296	0.005	0.00115	13.2	88.8	0.005
6	11754.53	-275	2165552.79	16978344.31	789.3	0.265	0.15369	30.1	0.306	0.005	0.00119	13.2	88.8	0.005
7	11754.53	-270	2165557.79	16978344.43	789.3	0.275	0.15936	30.1	0.318	0.005	0.00123	13.2	88.8	0.005
8	11754.52	-265	2165562.79	16978344.54	789.3	0.285	0.16535	30.1	0.329	0.005	0.00128	13.2	88.8	0.006
9	11754.52	-260	2165567.79	16978344.66	789.3	0.296	0.17168	30.1	0.342	0.006	0.00132	13.2	88.8	0.006
10	11754.52	-255	2165572.79	16978344.77	789.3	0.307	0.17838	30.1	0.355	0.006	0.00137	13.2	88.8	0.006
11	11754.52	-250	2165577.78	16978344.89	789.3	0.319	0.18547	30.1	0.369	0.006	0.00142	13.2	88.7	0.006
12	11754.52	-245	2165582.78	16978345.01	789.3	0.332	0.193	30.1	0.384	0.006	0.00147	13.2	88.7	0.006
13	11754.52	-240	2165587.78	16978345.12	789.3	0.346	0.20099	30.1	0.4	0.007	0.00152	13.2	88.7	0.007
14	11754.52	-235	2165592.78	16978345.24	789.3	0.361	0.20948	30.2	0.417	0.007	0.00158	13.1	88.7	0.007
15	11754.52	-230	2165597.78	16978345.35	789.3	0.376	0.21852	30.2	0.435	0.007	0.00164	13.1	88.6	0.007
16	11754.52	-225	2165602.78	16978345.47	789.3	0.393	0.22816	30.2	0.454	0.007	0.00171	13.1	88.6	0.008
17	11754.52	-220	2165607.78	16978345.58	789.3	0.41	0.23844	30.2	0.474	0.008	0.00177	13.1	88.6	0.008
18	11754.52	-215	2165612.78	16978345.7	789.3	0.429	0.24943	30.2	0.496	0.008	0.00185	13.1	88.6	0.008
19	11754.52	-210	2165617.77	16978345.81	789.3	0.449	0.26118	30.2	0.519	0.008	0.00192	13	88.5	0.009
20	11754.52	-205	2165622.77	16978345.93	789.3	0.47	0.27379	30.2	0.544	0.009	0.002	13	88.5	0.009
21	11754.51	-200	2165627.77	16978346.05	789.3	0.493	0.28732	30.2	0.571	0.009	0.00209	13	88.5	0.009
22	11754.51	-195	2165632.77	16978346.16	789.3	0.518	0.30187	30.2	0.6	0.009	0.00218	13	88.5	0.01
23	11754.51	-190	2165637.77	16978346.28	789.3	0.545	0.31754	30.2	0.631	0.01	0.00227	12.9	88.4	0.01
24	11754.51	-185	2165642.77	16978346.39	789.3	0.574	0.33445	30.2	0.664	0.01	0.00237	12.9	88.4	0.011
25	11754.51	-180	2165647.77	16978346.51	789.3	0.605	0.35274	30.3	0.7	0.011	0.00248	12.8	88.4	0.011
26	11754.51	-175	2165652.76	16978346.62	789.3	0.638	0.37255	30.3	0.739	0.011	0.00259	12.8	88.3	0.012
27	11754.51	-170	2165657.76	16978346.74	789.3	0.675	0.39406	30.3	0.781	0.012	0.00271	12.8	88.3	0.012
28	11754.51	-165	2165662.76	16978346.85	789.3	0.714	0.41747	30.3	0.827	0.013	0.00283	12.7	88.3	0.013
29	11754.51	-160	2165667.76	16978346.97	789.3	0.757	0.44299	30.3	0.877	0.013	0.00296	12.6	88.3	0.014
30	11754.51	-155	2165672.76	16978347.09	789.3	0.804	0.4709	30.3	0.932	0.014	0.0031	12.6	88.2	0.014
31	11754.51	-150	2165677.76	16978347.2	789.3	0.856	0.50148	30.4	0.992	0.015	0.00325	12.5	88.2	0.015
32	11754.51	-145	2165682.76	16978347.32	789.3	0.912	0.5351	30.4	1.058	0.015	0.0034	12.4	88.2	0.016
33	11754.51	-140	2165687.76	16978347.43	789.3	0.974	0.57215	30.4	1.13	0.016	0.00356	12.3	88.2	0.017
34	11754.5	-135	2165692.75	16978347.55	789.3	1.043	0.61311	30.4	1.21	0.017	0.00372	12.2	88.1	0.018
35	11754.5	-130	2165697.75	16978347.66	789.3	1.119	0.65855	30.5	1.298	0.018	0.00388	12.1	88.1	0.019
36	11754.5	-125	2165702.75	16978347.78	789.3	1.203	0.70911	30.5	1.396	0.019	0.00405	11.9	88.1	0.02
37	11754.5	-120	2165707.75	16978347.9	789.3	1.297	0.76558	30.6	1.506	0.02	0.00422	11.7	88.1	0.021
38	11754.5	-115	2165712.75	16978348.01	789.3	1.401	0.8289	30.6	1.628	0.021	0.00437	11.5	88.1	0.022
39	11754.5	-110	2165717.75	16978348.13	789.3	1.519	0.90017	30.7	1.765	0.023	0.00451	11.2	88.1	0.023
40	11754.5	-105	2165722.75	16978348.24	789.3	1.651	0.98074	30.7	1.92	0.024	0.00463	10.9	88.2	0.024
41	11754.5	-100	2165727.74	16978348.36	789.3	1.8	1.07224	30.8	2.095	0.025	0.00471	10.5	88.3	0.026
42	11754.5	-95	2165732.74	16978348.47	789.3	1.97	1.17665	30.9	2.294	0.027	0.00472	10	88.4	0.027
43	11754.5	-90	2165737.74	16978348.59	789.3	2.163	1.29639	30.9	2.522	0.028	0.00464	9.4	88.5	0.028
44	11754.5	-85	2165742.74	16978348.7	789.3	2.384	1.43444	31	2.782	0.029	0.00442	8.6	88.7	0.03
45	11754.5	-80	2165747.74	16978348.82	789.3	2.638	1.59449	31.1	3.083	0.03	0.00401	7.6	89.1	0.03
46	11754.5	-75	2165752.74	16978348.94	789.3	2.932	1.7811	31.3	3.431	0.031	0.00332	6.1	89.5	0.031
47	11754.49	-70	2165757.74	16978349.05	789.3	3.273	1.99996	31.4	3.836	0.031	0.0023	4.2	90.2	0.031
48	11754.49	-65	2165762.74	16978349.17	789.3	3.67	2.25812	31.6	4.309	0.031	0.00138	2.6	91.1	0.031
49	11754.49	-60	2165767.73	16978349.28	789.3	4.135	2.56435	31.8	4.866	0.029	0.0031	6	92.5	0.029
50	11754.49	-55	2165772.73	16978349.4	789.3	4.68	2.9294	32	5.521	0.026	0.00706	15.1	94.1	0.027
51	11754.49	-50	2165777.73	16978349.51	789.3	5.319	3.36621	32.3	6.295	0.021	0.01315	32.4	93.8	0.024
52	11754.49	-45	2165782.73	16978349.63	789.3	6.069	3.88979	32.7	7.209	0.013	0.02216	59.5	83	0.024
53	11754.49	-40	2165787.73	16978349.74	789.3	6.945	4.5163	33	8.284	0.011	0.03527	73.3	72.3	0.036
54	11754.49	-35	2165792.73	16978349.86	789.3	7.957	5.26049	33.5	9.538	0.027	0.05403	63.4	72.4	0.06



55	11754.49	-30	2165797.73	16978349.98	789.3	9.104	6.13022	34	10.975	0.054	0.08016	55.8	74.5	0.097
56	11754.49	-25	2165802.72	16978350.09	789.3	10.365	7.11651	34.5	12.573	0.091	0.11509	51.7	76.8	0.147
57	11754.49	-20	2165807.72	16978350.21	789.3	11.684	8.17903	35	14.262	0.135	0.15877	49.6	79	0.208
58	11754.49	-15	2165812.72	16978350.32	789.3	12.957	9.23216	35.5	15.909	0.183	0.2081	48.7	81.4	0.277
59	11754.49	-10	2165817.72	16978350.44	789.3	14.039	10.14509	35.9	17.321	0.228	0.25571	48.3	84.1	0.343
60	11754.48	-5	2165822.72	16978350.55	789.3	14.772	10.77054	36.1	18.281	0.261	0.29099	48.1	87	0.391
61	11754.48	0	2165827.72	16978350.67	789.3	15.033	10.99435	36.2	18.624	0.273	0.30417	48.1	90	0.409
62	11754.48	5	2165832.72	16978350.78	789.3	14.776	10.77431	36.1	18.287	0.261	0.29127	48.1	93	0.391
63	11754.48	10	2165837.72	16978350.9	789.3	14.048	10.15219	35.9	17.332	0.229	0.2562	48.3	95.9	0.343
64	11754.48	15	2165842.71	16978351.02	789.3	12.968	9.24161	35.5	15.924	0.184	0.20868	48.6	98.5	0.278
65	11754.48	20	2165847.71	16978351.13	789.3	11.697	8.18957	35	14.279	0.136	0.15934	49.6	100.9	0.209
66	11754.48	25	2165852.71	16978351.25	789.3	10.378	7.12701	34.5	12.59	0.091	0.11558	51.7	103.2	0.147
67	11754.48	30	2165857.71	16978351.36	789.3	9.117	6.13995	34	10.991	0.055	0.08055	55.7	105.4	0.097
68	11754.48	35	2165862.71	16978351.48	789.3	7.968	5.26911	33.5	9.553	0.027	0.05432	63.2	107.6	0.06
69	11754.48	40	2165867.71	16978351.59	789.3	6.955	4.52373	33	8.297	0.011	0.03548	73.3	107.7	0.036
70	11754.48	45	2165872.71	16978351.71	789.3	6.078	3.89611	32.7	7.22	0.013	0.02231	59.9	97.3	0.024
71	11754.48	50	2165877.7	16978351.82	789.3	5.327	3.37155	32.3	6.304	0.021	0.01326	32.8	86.3	0.024
72	11754.48	55	2165882.7	16978351.94	789.3	4.686	2.9339	32	5.529	0.026	0.00714	15.4	85.9	0.027
73	11754.47	60	2165887.7	16978352.06	789.3	4.141	2.56814	31.8	4.872	0.029	0.00315	6.2	87.5	0.029
74	11754.47	65	2165892.7	16978352.17	789.3	3.675	2.26133	31.6	4.315	0.031	0.00138	2.6	88.8	0.031
75	11754.47	70	2165897.7	16978352.29	789.3	3.277	2.00268	31.4	3.841	0.031	0.00227	4.2	89.8	0.031
76	11754.47	75	2165902.7	16978352.4	789.3	2.936	1.78343	31.3	3.435	0.031	0.0033	6.1	90.5	0.031
77	11754.47	80	2165907.7	16978352.52	789.3	2.641	1.59649	31.1	3.086	0.03	0.00399	7.5	90.9	0.03
78	11754.47	85	2165912.7	16978352.63	789.3	2.387	1.43617	31	2.786	0.029	0.00441	8.6	91.3	0.029
79	11754.47	90	2165917.69	16978352.75	789.3	2.165	1.29788	30.9	2.524	0.028	0.00463	9.4	91.5	0.028
80	11754.47	95	2165922.69	16978352.86	789.3	1.972	1.17795	30.9	2.297	0.027	0.00471	10	91.6	0.027
81	11754.47	100	2165927.69	16978352.98	789.3	1.802	1.07338	30.8	2.097	0.025	0.0047	10.5	91.7	0.026
82	11754.47	105	2165932.69	16978353.1	789.3	1.652	0.98175	30.7	1.922	0.024	0.00463	10.9	91.8	0.024
83	11754.47	110	2165937.69	16978353.21	789.3	1.52	0.90106	30.7	1.767	0.023	0.00451	11.2	91.9	0.023
84	11754.47	115	2165942.69	16978353.33	789.3	1.403	0.82969	30.6	1.63	0.022	0.00437	11.5	91.9	0.022
85	11754.47	120	2165947.69	16978353.44	789.3	1.298	0.76629	30.6	1.507	0.02	0.00421	11.7	91.9	0.021
86	11754.46	125	2165952.68	16978353.56	789.3	1.204	0.70974	30.5	1.398	0.019	0.00405	11.9	91.9	0.02
87	11754.46	130	2165957.68	16978353.67	789.3	1.12	0.65911	30.5	1.299	0.018	0.00388	12	91.9	0.019
88	11754.46	135	2165962.68	16978353.79	789.3	1.044	0.61362	30.5	1.211	0.017	0.00372	12.2	91.9	0.018
89	11754.46	140	2165967.68	16978353.9	789.3	0.975	0.57261	30.4	1.131	0.016	0.00356	12.3	91.8	0.017
90	11754.46	145	2165972.68	16978354.02	789.3	0.913	0.53552	30.4	1.058	0.015	0.0034	12.4	91.8	0.016
91	11754.46	150	2165977.68	16978354.14	789.3	0.856	0.50186	30.4	0.993	0.015	0.00325	12.5	91.8	0.015
92	11754.46	155	2165982.68	16978354.25	789.3	0.805	0.47124	30.3	0.933	0.014	0.0031	12.6	91.8	0.014
93	11754.46	160	2165987.68	16978354.37	789.3	0.758	0.44331	30.3	0.878	0.013	0.00296	12.6	91.7	0.014
94	11754.46	165	2165992.67	16978354.48	789.3	0.715	0.41776	30.3	0.828	0.013	0.00283	12.7	91.7	0.013
95	11754.46	170	2165997.67	16978354.6	789.3	0.675	0.39433	30.3	0.782	0.012	0.00271	12.7	91.7	0.012
96	11754.46	175	2166002.67	16978354.71	789.3	0.639	0.3728	30.3	0.739	0.011	0.00259	12.8	91.7	0.012
97	11754.46	180	2166007.67	16978354.83	789.3	0.605	0.35297	30.3	0.7	0.011	0.00248	12.8	91.6	0.011
98	11754.46	185	2166012.67	16978354.94	789.3	0.574	0.33466	30.2	0.664	0.01	0.00237	12.9	91.6	0.011
99	11754.45	190	2166017.67	16978355.06	789.3	0.545	0.31773	30.2	0.631	0.01	0.00227	12.9	91.6	0.01
100	11754.45	195	2166022.67	16978355.18	789.3	0.518	0.30205	30.2	0.6	0.009	0.00218	12.9	91.5	0.01
101	11754.45	200	2166027.66	16978355.29	789.3	0.494	0.28748	30.2	0.571	0.009	0.00209	13	91.5	0.009
102	11754.45	205	2166032.66	16978355.41	789.3	0.471	0.27394	30.2	0.545	0.009	0.002	13	91.5	0.009
103	11754.45	210	2166037.66	16978355.52	789.3	0.449	0.26133	30.2	0.52	0.008	0.00192	13	91.5	0.009
104	11754.45	215	2166042.66	16978355.64	789.3	0.429	0.24956	30.2	0.496	0.008	0.00185	13.1	91.4	0.008
105	11754.45	220	2166047.66	16978355.75	789.3	0.41	0.23857	30.2	0.475	0.008	0.00177	13.1	91.4	0.008
106	11754.45	225	2166052.66	16978355.87	789.3	0.393	0.22828	30.2	0.454	0.007	0.00171	13.1	91.4	0.008
107	11754.45	230	2166057.66	16978355.98	789.3	0.376	0.21863	30.2	0.435	0.007	0.00164	13.1	91.4	0.007
108	11754.45	235	2166062.66	16978356.1	789.3	0.361	0.20959	30.2	0.417	0.007	0.00158	13.1	91.3	0.007
109	11754.45	240	2166067.65	16978356.22	789.3	0.346	0.20109	30.1	0.4	0.007	0.00152	13.1	91.3	0.007

110	11754.45	245	2166072.65	16978356.33	789.3	0.333	0.19309	30.1	0.385	0.006	0.00147	13.2	91.3	0.006
111	11754.45	250	2166077.65	16978356.45	789.3	0.32	0.18556	30.1	0.37	0.006	0.00142	13.2	91.3	0.006
112	11754.44	255	2166082.65	16978356.56	789.3	0.307	0.17846	30.1	0.356	0.006	0.00137	13.2	91.2	0.006
113	11754.44	260	2166087.65	16978356.68	789.3	0.296	0.17176	30.1	0.342	0.006	0.00132	13.2	91.2	0.006
114	11754.44	265	2166092.65	16978356.79	789.3	0.285	0.16542	30.1	0.33	0.005	0.00128	13.2	91.2	0.006
115	11754.44	270	2166097.65	16978356.91	789.3	0.275	0.15943	30.1	0.318	0.005	0.00123	13.2	91.2	0.005
116	11754.44	275	2166102.64	16978357.02	789.3	0.265	0.15376	30.1	0.306	0.005	0.00119	13.2	91.2	0.005
117	11754.44	280	2166107.64	16978357.14	789.3	0.256	0.14838	30.1	0.296	0.005	0.00115	13.2	91.2	0.005
118	11754.44	285	2166112.64	16978357.26	789.3	0.247	0.14328	30.1	0.286	0.005	0.00112	13.3	91.1	0.005
119	11754.44	290	2166117.64	16978357.37	789.3	0.239	0.13844	30.1	0.276	0.005	0.00108	13.3	91.1	0.005
120	11754.44	295	2166122.64	16978357.49	789.3	0.231	0.13384	30.1	0.267	0.004	0.00105	13.3	91.1	0.005
121	11754.44	300	2166127.64	16978357.6	789.3	0.223	0.12946	30.1	0.258	0.004	0.00102	13.3	91.1	0.004

Row #	Station (ft)	Offset (ft)	X (ft)	Y (ft)	Z (ft)	B Real (mG)	B Img. (mG)	B Phase Angle (deg)	B rms Res. (mG)	E Real (kV/m)	E Img. (kV/m)	E Phase Angle (deg)	E Axis Angle (deg)	E rms Res. (kV/m)
1	52059.09	-300	2174075.43	17012228.98	836.32	0.16	0.09287	30.2	0.185	0.003	0.001	18.4	88.9	0.003
2	52059.09	-295	2174080.43	17012229.11	836.32	0.165	0.09581	30.2	0.191	0.003	0.00103	18.4	88.9	0.003
3	52059.09	-290	2174085.43	17012229.23	836.32	0.17	0.09889	30.2	0.197	0.003	0.00107	18.4	88.9	0.003
4	52059.09	-285	2174090.43	17012229.36	836.32	0.176	0.10214	30.2	0.203	0.003	0.0011	18.4	88.9	0.003
5	52059.09	-280	2174095.43	17012229.48	836.32	0.181	0.10556	30.2	0.21	0.003	0.00114	18.4	88.9	0.004
6	52059.09	-275	2174100.43	17012229.61	836.32	0.188	0.10917	30.2	0.217	0.004	0.00118	18.4	88.8	0.004
7	52059.09	-270	2174105.42	17012229.73	836.32	0.194	0.11296	30.2	0.225	0.004	0.00122	18.4	88.8	0.004
8	52059.09	-265	2174110.42	17012229.86	836.32	0.201	0.11697	30.2	0.232	0.004	0.00126	18.4	88.8	0.004
9	52059.09	-260	2174115.42	17012229.98	836.32	0.208	0.12121	30.2	0.241	0.004	0.0013	18.4	88.8	0.004
10	52059.09	-255	2174120.42	17012230.11	836.32	0.216	0.12569	30.2	0.25	0.004	0.00135	18.4	88.8	0.004
11	52059.09	-250	2174125.42	17012230.23	836.32	0.224	0.13044	30.2	0.259	0.004	0.0014	18.4	88.8	0.004
12	52059.09	-245	2174130.42	17012230.36	836.32	0.232	0.13547	30.2	0.269	0.004	0.00145	18.4	88.7	0.005
13	52059.09	-240	2174135.41	17012230.48	836.32	0.241	0.1408	30.2	0.28	0.005	0.00151	18.4	88.7	0.005
14	52059.09	-235	2174140.41	17012230.61	836.32	0.251	0.14647	30.3	0.291	0.005	0.00157	18.4	88.7	0.005
15	52059.09	-230	2174145.41	17012230.73	836.32	0.261	0.1525	30.3	0.303	0.005	0.00163	18.4	88.7	0.005
16	52059.09	-225	2174150.41	17012230.86	836.32	0.272	0.15893	30.3	0.315	0.005	0.00169	18.4	88.6	0.005
17	52059.09	-220	2174155.41	17012230.98	836.32	0.284	0.16578	30.3	0.329	0.005	0.00176	18.4	88.6	0.006
18	52059.09	-215	2174160.41	17012231.1	836.32	0.296	0.17309	30.3	0.343	0.006	0.00183	18.4	88.6	0.006
19	52059.09	-210	2174165.41	17012231.23	836.32	0.31	0.18091	30.3	0.359	0.006	0.00191	18.4	88.6	0.006
20	52059.09	-205	2174170.4	17012231.35	836.32	0.324	0.18929	30.3	0.375	0.006	0.00199	18.4	88.6	0.006
21	52059.09	-200	2174175.4	17012231.48	836.32	0.339	0.19828	30.3	0.393	0.006	0.00208	18.4	88.5	0.007
22	52059.09	-195	2174180.4	17012231.6	836.32	0.355	0.20793	30.3	0.412	0.007	0.00217	18.4	88.5	0.007
23	52059.09	-190	2174185.4	17012231.73	836.32	0.373	0.21832	30.4	0.432	0.007	0.00226	18.4	88.5	0.007
24	52059.09	-185	2174190.4	17012231.85	836.32	0.392	0.22953	30.4	0.454	0.007	0.00237	18.4	88.5	0.008
25	52059.09	-180	2174195.4	17012231.98	836.32	0.412	0.24163	30.4	0.477	0.007	0.00248	18.4	88.4	0.008
26	52059.09	-175	2174200.39	17012232.1	836.32	0.434	0.25472	30.4	0.503	0.008	0.00259	18.4	88.4	0.008
27	52059.09	-170	2174205.39	17012232.23	836.32	0.458	0.26893	30.4	0.531	0.008	0.00272	18.4	88.4	0.009
28	52059.09	-165	2174210.39	17012232.35	836.32	0.483	0.28436	30.5	0.561	0.009	0.00285	18.4	88.4	0.009
29	52059.09	-160	2174215.39	17012232.48	836.32	0.511	0.30118	30.5	0.594	0.009	0.00299	18.4	88.3	0.009
30	52059.09	-155	2174220.39	17012232.6	836.32	0.542	0.31954	30.5	0.629	0.009	0.00314	18.4	88.3	0.01
31	52059.09	-150	2174225.39	17012232.73	836.32	0.575	0.33963	30.6	0.668	0.01	0.00329	18.3	88.3	0.01
32	52059.09	-145	2174230.39	17012232.85	836.32	0.612	0.36168	30.6	0.711	0.01	0.00346	18.3	88.3	0.011
33	52059.09	-140	2174235.38	17012232.98	836.32	0.652	0.38594	30.6	0.758	0.011	0.00364	18.3	88.3	0.012
34	52059.09	-135	2174240.38	17012233.1	836.32	0.696	0.41272	30.7	0.809	0.012	0.00382	18.3	88.2	0.012
35	52059.09	-130	2174245.38	17012233.23	836.32	0.745	0.44237	30.7	0.866	0.012	0.00402	18.3	88.2	0.013
36	52059.09	-125	2174250.38	17012233.35	836.32	0.799	0.47529	30.8	0.929	0.013	0.00422	18.2	88.2	0.013
37	52059.09	-120	2174255.38	17012233.48	836.32	0.858	0.51197	30.8	0.999	0.013	0.00443	18.2	88.3	0.014
38	52059.09	-115	2174260.38	17012233.6	836.32	0.925	0.55301	30.9	1.077	0.014	0.00464	18.1	88.3	0.015
39	52059.09	-110	2174265.37	17012233.72	836.32	0.999	0.59907	30.9	1.165	0.015	0.00486	18.1	88.3	0.016
40	52059.09	-105	2174270.37	17012233.85	836.32	1.082	0.65099	31	1.263	0.016	0.00507	18	88.4	0.016
41	52059.09	-100	2174275.37	17012233.97	836.32	1.176	0.70977	31.1	1.373	0.016	0.00527	17.8	88.5	0.017
42	52059.09	-95	2174280.37	17012234.1	836.32	1.281	0.77661	31.2	1.498	0.017	0.00544	17.7	88.6	0.018
43	52059.09	-90	2174285.37	17012234.22	836.32	1.401	0.85296	31.3	1.64	0.018	0.00557	17.4	88.8	0.019
44	52059.09	-85	2174290.37	17012234.35	836.32	1.537	0.94061	31.5	1.802	0.018	0.00563	17.1	89.1	0.019
45	52059.09	-80	2174295.36	17012234.47	836.32	1.693	1.04176	31.6	1.988	0.019	0.00559	16.6	89.5	0.02
46	52059.09	-75	2174300.36	17012234.6	836.32	1.871	1.1591	31.8	2.201	0.019	0.00538	15.8	90.1	0.02
47	52059.09	-70	2174305.36	17012234.72	836.32	2.076	1.29594	32	2.448	0.019	0.00495	14.7	91	0.019
48	52059.09	-65	2174310.36	17012234.85	836.32	2.313	1.45638	32.2	2.734	0.018	0.00417	12.9	92.3	0.019
49	52059.09	-60	2174315.36	17012234.97	836.32	2.588	1.64547	32.5	3.066	0.017	0.00297	10.1	94.5	0.017
50	52059.09	-55	2174320.36	17012235.1	836.32	2.906	1.86935	32.8	3.455	0.014	0.00173	6.9	98.2	0.014
51	52059.09	-50	2174325.36	17012235.22	836.32	3.276	2.13542	33.1	3.91	0.011	0.00348	18.2	103.8	0.011
52	52059.09	-45	2174330.35	17012235.35	836.32	3.705	2.45231	33.5	4.443	0.006	0.00817	53.6	78.4	0.008
53	52059.09	-40	2174335.35	17012235.47	836.32	4.201	2.82956	34	5.065	0.008	0.01537	62.6	64	0.017
54	52059.09	-35	2174340.35	17012235.6	836.32	4.771	3.27656	34.5	5.788	0.019	0.02582	53.2	69.7	0.032



55	52059.09	-30	2174345.35	17012235.72	836.32	5.415	3.8002	35.1	6.615	0.036	0.04051	48.5	73.6	0.054
56	52059.09	-25	2174350.35	17012235.85	836.32	6.126	4.4002	35.7	7.543	0.057	0.06037	46.5	76.3	0.083
57	52059.09	-20	2174355.35	17012235.97	836.32	6.881	5.06136	36.3	8.542	0.083	0.08573	45.8	78.7	0.12
58	52059.09	-15	2174360.34	17012236.09	836.32	7.633	5.74302	37	9.552	0.112	0.11537	45.8	81	0.161
59	52059.09	-10	2174365.34	17012236.22	836.32	8.303	6.37046	37.5	10.465	0.14	0.14555	46.1	83.5	0.202
60	52059.09	-5	2174370.34	17012236.34	836.32	8.792	6.83943	37.9	11.139	0.162	0.1698	46.4	86.4	0.235
61	52059.09	0	2174375.34	17012236.47	836.32	9.005	7.04646	38	11.434	0.172	0.18103	46.5	89.5	0.249
62	52059.09	5	2174380.34	17012236.59	836.32	8.893	6.93821	38	11.279	0.167	0.17534	46.5	92.6	0.242
63	52059.09	10	2174385.34	17012236.72	836.32	8.482	6.54303	37.6	10.712	0.148	0.15478	46.2	95.6	0.214
64	52059.09	15	2174390.34	17012236.84	836.32	7.856	5.95372	37.2	9.857	0.122	0.12583	45.9	98.2	0.175
65	52059.09	20	2174395.33	17012236.97	836.32	7.12	5.27902	36.6	8.864	0.093	0.09551	45.7	100.5	0.133
66	52059.09	25	2174400.33	17012237.09	836.32	6.359	4.6048	35.9	7.851	0.066	0.06852	46.1	102.8	0.095
67	52059.09	30	2174405.33	17012237.22	836.32	5.629	3.98211	35.3	6.895	0.043	0.04683	47.6	105.3	0.063
68	52059.09	35	2174410.33	17012237.34	836.32	4.962	3.43313	34.7	6.034	0.025	0.0305	51.1	108.6	0.039
69	52059.09	40	2174415.33	17012237.47	836.32	4.368	2.9619	34.1	5.278	0.011	0.01873	58.7	113.5	0.022
70	52059.09	45	2174420.33	17012237.59	836.32	3.849	2.56316	33.7	4.625	0.005	0.01053	63.9	116	0.011
71	52059.09	50	2174425.32	17012237.72	836.32	3.4	2.22796	33.2	4.065	0.009	0.00501	30	76.2	0.009
72	52059.09	55	2174430.32	17012237.84	836.32	3.012	1.94661	32.9	3.586	0.013	0.0019	8.4	79.8	0.013
73	52059.09	60	2174435.32	17012237.97	836.32	2.678	1.71013	32.6	3.178	0.016	0.00232	8.4	84.3	0.016
74	52059.09	65	2174440.32	17012238.09	836.32	2.391	1.5107	32.3	2.828	0.017	0.00364	11.8	87	0.018
75	52059.09	70	2174445.32	17012238.22	836.32	2.143	1.34176	32.1	2.528	0.018	0.00456	14	88.6	0.019
76	52059.09	75	2174450.32	17012238.34	836.32	1.929	1.19794	31.8	2.27	0.019	0.00512	15.3	89.6	0.019
77	52059.09	80	2174455.32	17012238.47	836.32	1.742	1.07484	31.7	2.047	0.019	0.0054	16.2	90.3	0.019
78	52059.09	85	2174460.31	17012238.59	836.32	1.58	0.96893	31.5	1.854	0.018	0.00551	16.8	90.7	0.019
79	52059.09	90	2174465.31	17012238.71	836.32	1.438	0.8773	31.4	1.685	0.018	0.00549	17.2	91.1	0.019
80	52059.09	95	2174470.31	17012238.84	836.32	1.314	0.79763	31.3	1.537	0.017	0.00539	17.5	91.3	0.018
81	52059.09	100	2174475.31	17012238.96	836.32	1.204	0.72801	31.2	1.407	0.016	0.00524	17.7	91.4	0.017
82	52059.09	105	2174480.31	17012239.09	836.32	1.107	0.66688	31.1	1.293	0.016	0.00505	17.8	91.6	0.016
83	52059.09	110	2174485.31	17012239.21	836.32	1.021	0.61297	31	1.191	0.015	0.00485	17.9	91.6	0.016
84	52059.09	115	2174490.3	17012239.34	836.32	0.944	0.5652	30.9	1.1	0.014	0.00464	18	91.7	0.015
85	52059.09	120	2174495.3	17012239.46	836.32	0.876	0.52272	30.8	1.02	0.014	0.00443	18.1	91.7	0.014
86	52059.09	125	2174500.3	17012239.59	836.32	0.814	0.48478	30.8	0.947	0.013	0.00422	18.1	91.7	0.014
87	52059.09	130	2174505.3	17012239.71	836.32	0.758	0.45078	30.7	0.882	0.012	0.00402	18.2	91.7	0.013
88	52059.09	135	2174510.3	17012239.84	836.32	0.708	0.4202	30.7	0.824	0.012	0.00383	18.2	91.7	0.012
89	52059.09	140	2174515.3	17012239.96	836.32	0.663	0.39261	30.6	0.771	0.011	0.00364	18.2	91.7	0.012
90	52059.09	145	2174520.29	17012240.09	836.32	0.622	0.36764	30.6	0.722	0.011	0.00347	18.2	91.7	0.011
91	52059.09	150	2174525.29	17012240.21	836.32	0.584	0.34496	30.6	0.679	0.01	0.0033	18.3	91.7	0.011
92	52059.09	155	2174530.29	17012240.34	836.32	0.55	0.32433	30.5	0.639	0.01	0.00314	18.3	91.7	0.01
93	52059.09	160	2174535.29	17012240.46	836.32	0.519	0.30549	30.5	0.602	0.009	0.00299	18.3	91.7	0.01
94	52059.09	165	2174540.29	17012240.59	836.32	0.49	0.28825	30.5	0.569	0.009	0.00285	18.3	91.6	0.009
95	52059.09	170	2174545.29	17012240.71	836.32	0.464	0.27244	30.4	0.538	0.008	0.00272	18.3	91.6	0.009
96	52059.09	175	2174550.29	17012240.84	836.32	0.439	0.2579	30.4	0.509	0.008	0.0026	18.3	91.6	0.008
97	52059.09	180	2174555.28	17012240.96	836.32	0.417	0.24451	30.4	0.483	0.007	0.00248	18.3	91.6	0.008
98	52059.09	185	2174560.28	17012241.08	836.32	0.396	0.23214	30.4	0.459	0.007	0.00237	18.3	91.5	0.008
99	52059.09	190	2174565.28	17012241.21	836.32	0.377	0.2207	30.4	0.437	0.007	0.00226	18.3	91.5	0.007
100	52059.09	195	2174570.28	17012241.33	836.32	0.359	0.2101	30.3	0.416	0.007	0.00217	18.3	91.5	0.007
101	52059.09	200	2174575.28	17012241.46	836.32	0.342	0.20026	30.3	0.397	0.006	0.00207	18.3	91.5	0.007
102	52059.09	205	2174580.28	17012241.58	836.32	0.327	0.1911	30.3	0.379	0.006	0.00199	18.3	91.4	0.006
103	52059.09	210	2174585.27	17012241.71	836.32	0.313	0.18257	30.3	0.362	0.006	0.00191	18.3	91.4	0.006
104	52059.09	215	2174590.27	17012241.83	836.32	0.299	0.17461	30.3	0.346	0.006	0.00183	18.3	91.4	0.006
105	52059.09	220	2174595.27	17012241.96	836.32	0.286	0.16717	30.3	0.332	0.005	0.00176	18.3	91.4	0.006
106	52059.09	225	2174600.27	17012242.08	836.32	0.275	0.16021	30.3	0.318	0.005	0.00169	18.3	91.4	0.005
107	52059.09	230	2174605.27	17012242.21	836.32	0.264	0.15369	30.2	0.305	0.005	0.00162	18.3	91.3	0.005
108	52059.09	235	2174610.27	17012242.33	836.32	0.253	0.14757	30.2	0.293	0.005	0.00156	18.3	91.3	0.005
109	52059.09	240	2174615.27	17012242.46	836.32	0.243	0.14182	30.2	0.282	0.005	0.0015	18.3	91.3	0.005

110	52059.09	245	2174620.26	17012242.58	836.32	0.234	0.1364	30.2	0.271	0.004	0.00145	18.3	91.3	0.005
111	52059.09	250	2174625.26	17012242.71	836.32	0.226	0.13131	30.2	0.261	0.004	0.0014	18.3	91.3	0.004
112	52059.09	255	2174630.26	17012242.83	836.32	0.217	0.1265	30.2	0.251	0.004	0.00135	18.3	91.2	0.004
113	52059.09	260	2174635.26	17012242.96	836.32	0.21	0.12196	30.2	0.243	0.004	0.0013	18.3	91.2	0.004
114	52059.09	265	2174640.26	17012243.08	836.32	0.202	0.11768	30.2	0.234	0.004	0.00125	18.3	91.2	0.004
115	52059.09	270	2174645.26	17012243.21	836.32	0.195	0.11362	30.2	0.226	0.004	0.00121	18.3	91.2	0.004
116	52059.09	275	2174650.25	17012243.33	836.32	0.189	0.10978	30.2	0.218	0.004	0.00117	18.3	91.2	0.004
117	52059.09	280	2174655.25	17012243.46	836.32	0.183	0.10614	30.2	0.211	0.003	0.00113	18.3	91.1	0.004
118	52059.09	285	2174660.25	17012243.58	836.32	0.177	0.10269	30.2	0.204	0.003	0.00109	18.3	91.1	0.003
119	52059.09	290	2174665.25	17012243.7	836.32	0.171	0.09941	30.2	0.198	0.003	0.00106	18.2	91.1	0.003
120	52059.09	295	2174670.25	17012243.83	836.32	0.166	0.09629	30.1	0.192	0.003	0.00103	18.2	91.1	0.003
121	52059.09	300	2174675.25	17012243.95	836.32	0.161	0.09333	30.1	0.186	0.003	0.00099	18.2	91.1	0.003

APPENDIX F

AGENCY AND LOCAL GOVERNMENT CORRESPONDENCE

Federal Correspondence



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Bill Sande
Project Manager
United States Army Corps of Engineers
15954 River's Edge Dr. Suite 240
Hayward, WI 54843

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Bill Sande:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

Xcel Energy has identified two potential routes between the proposed substations: the East Route and West Route. The East Route would be constructed as a double-circuit with an existing 34.5 kV transmission line (100-foot-wide right-of-way) and utilize a temporary bypass transmission line in a separate corridor during construction of the new line to avoid power outages. The West Route would be mainly a single-circuit line, following existing roads to the extent possible, and would utilize a 50-foot-wide right-of-way. Both routes share a common segment at the south end. The attached map depicts the Project’s routes and proposed substations. More information about the project is also available on the Project website at XcelEnergy.com/Bayfield.

Xcel Energy intends to file a Certificate of Authority Application, in accordance with the Application Filing Requirements for Transmission Line and Substation projects to the Public Service Commission of Wisconsin (“PSCW”) for the Project by the end of 2018. As part of this process, Xcel Energy has conducted public meetings, including a routing workshop for interested landowners. The routes depicted here represent the two best route options based on landowner feedback, engineering constraints, and costs. The PSCW will determine which route is to be constructed.

Xcel Energy will continue to coordinate with applicable regulatory and government offices. We appreciate your assistance as we work through the PSCW’s approval process; therefore, please let us know if you have information we should consider.

If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Pete Fasbender
Field Office Supervisor
United States Fish and Wildlife Service
4101 American Boulevard East
Bloomington, MN 55425

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Pete Fasbender:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Bridget Olson
Manager, St. Croix Wetland Mgmt Dist
United States Fish and Wildlife Service
1764 95th St
New Richmond, WI 54017

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Bridget Olson:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Refuge Manager
Whittlesey Creek NWR
United States Fish and Wildlife Service
NGLVC 29270 Co Hwy G
Ashland, WI 54806

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Refuge Manager:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Jonathan McNeill
Washburn Ranger Station - Real Estate
United States Forest Service
113 Bayfield St. East
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Jonathan McNeill:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

Xcel Energy has identified two potential routes between the proposed substations: the East Route and West Route. The East Route would be constructed as a double-circuit with an existing 34.5 kV transmission line (100-foot-wide right-of-way) and utilize a temporary bypass transmission line in a separate corridor during construction of the new line to avoid power outages. The West Route would be mainly a single-circuit line, following existing roads to the extent possible, and would utilize a 50-foot-wide right-of-way. Both routes share a common segment at the south end. The attached map depicts the Project’s routes and proposed substations. More information about the project is also available on the Project website at XcelEnergy.com/Bayfield.

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If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

January 15, 2019

—Via Electronic Filing—

Mr. Andrew Horton
U.S. Fish and Wildlife Service
Twin Cities Ecological Services Field Office
4101 American Boulevard East
Bloomington, MN 55425

Via email: andrew_horton@fws.gov

**RE: Bayfield Second Circuit Transmission Line Project, Endangered Species Act -
Request for Informal Section 7 Consultation**

Dear Mr. Horton:

Xcel Energy is proposing to build a 34.5 kilovolt (kV) transmission line and two new substations in the Bayfield Peninsula area. The proposed transmission line would run from a new Fish Creek Substation about 4 miles west of the City of Ashland to a new Pikes Creek Substation about 2 miles west of the City of Bayfield, Wisconsin, with an additional 3-mile 34.5 kV line connecting to the City of Washburn. A project location map is attached. The Bayfield Second Circuit Transmission Project (Project) provides a second source of power to the east side of the Bayfield Peninsula which will increase electric reliability and provide additional support to minimize power outages across the Bayfield Peninsula.

The Project will require a Section 404 permit from the U.S. Army Corps of Engineers for wetland impacts. The Project also requires a Certificate of Authority from the Public Service Commission of Wisconsin (PSCW or Commission) and a Utility Permit from the Wisconsin Department of Natural Resources (WDNR). In its joint application to the PSCW and WDNR (Joint Application), Xcel Energy provides two proposed route options (the West Route and the East Route) that are located in Bayfield County and both of which begin at the proposed Fish Creek Substation west of Ashland and terminate at the proposed Pikes Creek Substation west of Bayfield; the final route will be ordered by the PSCW. Xcel Energy will apply for the Section 404 permit on the ordered route.

The East Route is approximately 18.9 miles in length and would double circuit with existing transmission. To maintain electric service during construction, a 26.4-mile temporary bypass line would be needed for this route.

The West Route is approximately 26 miles in length, including a 4.1-mile gen-tie line connecting the West Route to the existing Washburn Tap. The first 3.5 miles of this route would be double circuit with existing transmission and therefore would require a temporary bypass.

Project construction is expected to begin in 2020 and be in-service by 2021, pending agency permits and authorizations.

Xcel Energy identified the following federally listed species that are known or expected to occur in the Project area¹. No critical habitat was identified within the Project area.

Species	Status	Habitat
Canada lynx (<i>Lynx canadensis</i>)	Threatened	Northern forest
Gray wolf (<i>Canis lupis</i>)	Threatened	Alpine, forest, grassland, shrubland, and woodland habitats
Northern long-eared bat (<i>Myotis septentrionalis</i>)	Threatened	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during spring and summer.
Red knot (<i>Calidris canutus rufa</i>)	Threatened	Coastal sandy beaches
Fassett's locoweed (<i>Oxytropis campestris</i> var. <i>chartacea</i>)	Threatened	Grows on gentle slopes in sand-gravel shorelines around shallow lakes which are subject to water level fluctuations.

The red knot is an Arctic breeder that occurs uncommonly during migration along coastal sandy beaches in Wisconsin from mid-May to early June in spring and from mid-July to early November in fall. The Fassett's locoweed is found in sandy, fluctuating lakeshores. Neither route option would impact coastal sandy beaches or lakeshores. As such, Xcel Energy believes the Project will have *no effect* on the red knot or Fassett's locoweed, and these species are not discussed further. Xcel Energy understands that the U.S. Fish and Wildlife Service (USFWS) does not require concurrence be obtained for *no effect* determinations.

For the reasons listed below, we believe the Project activities are *not likely to adversely affect* the Canada lynx, gray wolf, and northern long-eared bat.

Canada Lynx (*Lynx canadensis*)

The Canada lynx is a medium-size cat that generally inhabits moist boreal forest that have cold, snowy winters and a high-density snowshoe hare prey base. The predominant vegetation of boreal forest is conifer trees, primarily species of spruce (*Picea* spp.) and fir (*Abies* spp.). In the contiguous United States, the boreal forest type transitions to deciduous temperate forest in the Northeast and Great Lakes, and to subalpine forest in the west. Individual lynx maintain large home ranges generally between 12 to 83 square miles.

The Canada lynx is considered abundant in Canada and Alaska and occurs in 95 percent of the species' historic range. However, in the southern portion of its range (i.e., the contiguous United States) populations were weakened by the fur trade, and the species was listed as federally listed threatened in the United States in 2000. The USFWS has identified the permanent United

¹ Project review completed using: <https://ecos.fws.gov/ipac/location/index> (Accessed November 2018)

States population as a distinct population segment and has identified priority areas for conservation. Threats to the distinct population segment in the United States include anthropogenic development, mining, silvicultural management practices, grazing, trapping, predator control, roads, climate change, and habitat loss and fragmentation.

Construction activities associated with the Project have the potential to impact individual Canada lynx in the Project area. Specifically, noise or presence of humans and equipment involved in construction activities may cause Canada lynx to divert from the area. The resulting response would be temporary disturbance that would not have a measurable or detectable effect on an individual's survivorship or reproductive capacity. As such, the potential impact would be insignificant and would not result in harassment or an adverse impact.

Canada lynx use a variety of forest cover types for hunting and denning. These types of habitat would be impacted during construction, which in turn may temporarily affect individual lynx foraging and sheltering behaviors. However, the abundance of habitat in the vicinity of the Project suggests that forested habitat impacted by the Project would not subtract from the overall availability of these habitat types for Canada lynx and would not result in a measurable or detectable impact on an individual's sheltering, feeding, or breeding behaviors. Thus, any potential impacts from construction activities associated with the Project on suitable habitat would be insignificant and would not result in harm or an adverse impact.

If a Canada lynx is sighted within 1 mile of the construction workspace during construction, or if the USFWS notifies Xcel Energy of a Canada lynx sighting within 1 mile of the construction workspace, construction activities would cease until the individual(s) have left the area. Any lynx sightings during construction would be immediately reported to the USFWS and WDNR.

Due to the low density of the species in the Project area, the highly mobile nature of the species, and the proposed conservation measures, the potential impacts on the Canada lynx would be insignificant. Therefore, we conclude that the Project *may affect, but is not likely to adversely affect* this species.

Gray Wolf (*Canis lupis*)

The gray wolf is the largest of the wild dog species and is found in a variety of habitats throughout

North America. Gray wolves prey primarily on large ungulates, including white-tailed deer (*Odocoileus virginianus*), elk (*Cervus elaphus*), moose (*Alces alces*), bison (*Bison bison*), and caribou (*Rangifer tarandus*), depending on location. They will occasionally take smaller prey, including beaver (*Castor canadensis*), insects, various small mammals, and domestic animals. Additionally, wolves will usurp carcasses and scavenge carrion opportunistically from kills made by other carnivores.

A habitat generalist, the gray wolf originally occupied most habitat types in North America. They show no preference for one cover type over another and successfully utilize alpine, forest, grassland, shrubland, and woodland habitats across their range. Once thought to require wilderness areas with little to no human disturbance, recent range expansions have demonstrated the species' ability to tolerate higher rates of anthropogenic development than previously

thought. Given abundant prey and low rates of human-caused mortality, wolves can survive in proximity to human-dominated environments.

The gray wolf population in the United States had been extirpated throughout much of its natural range due to the depletion of wild prey populations by early European settlers and subsequent widespread predator control programs. Shooting, poisoning, and trapping in conjunction with bounties were promoted by government agencies to combat increasing livestock depredation by wolves throughout the 19th and 20th centuries. Furthermore, logging and the conversion of forested wildlands to agricultural uses significantly reduced wolf habitat. Current threats to the species include human-caused mortality (e.g., illegal shooting, competition with humans over livestock) and continued habitat loss due to fragmentation.

Construction activities associated with the Project have the potential to disturb gray wolf individuals in the Project area. Specifically, noise or presence of humans and equipment involved in construction activities may cause gray wolf adults and juveniles to divert from the area. The resulting response would be temporary disturbance that would not have a measurable or detectable effect on an individual's survivorship or reproductive capacity. Therefore, the potential impact on gray wolves would be insignificant and would not result in harassment or other adverse impact.

If a gray wolf is sighted within 1 mile of the construction workspace during construction, or if the USFWS notifies Xcel Energy of a gray wolf sighting within 1 mile of the construction workspace, construction activities would cease until the individual(s) have left the area. Any wolf sightings during construction would be immediately reported to the USFWS and the WDNR.

Due to the highly mobile nature of the species, its use of a variety of habitats, and the proposed conservation measures, potential impacts on the Western Great Lakes population of gray wolf would be insignificant. Therefore, we conclude that the Project *may affect, but is not likely to adversely affect* this species.

Northern Long-eared Bat (*Myotis septentrionalis*)

The range of the northern long-eared bat stretches across much of the eastern and Midwestern United States. During summer, northern long-eared bats roost singly or in colonies under bark, in cavities, or in crevices of both live and dead trees. Males and non-reproductive females may also roost in cooler places such as caves and mines. This species is thought to be opportunistic in selecting roosts, utilizing tree species based on the tree's ability to retain bark or provide cavities or crevices. It has also been found, rarely, roosting in structures such as barns and sheds. In winter, northern long-eared bats utilize caves and mines as hibernacula.

The northern long-eared bat was listed as a federally threatened species in May 2015, with an interim 4(d) rule; effective February 16, 2016, the USFWS finalized the 4(d) rule. A 4(d) rule may only be applied to species listed as threatened, and is a tool periodically utilized by the USFWS to allow for flexibility in Endangered Species Act (ESA) implementation. The rule allows the USFWS to tailor take restrictions to those that make the most sense for protecting and managing at-risk species, and directs the USFWS to issue regulations considered "necessary and advisable to provide for the conservation of threatened species."

Per the final 4(d) rule, incidental take as a result of Project activities is not prohibited provided:

1. Known roost trees and trees within 150 feet of the known roost are not cleared between June 1 and July 31; and
2. Tree clearing is not conducted within 0.25 mile of a known hibernaculum at any time of year.

Merjent, Inc., on behalf of Xcel Energy, reviewed the most recent Wisconsin Natural Heritage Information (NHI) rare features database to identify the presence of maternity roost trees or hibernacula in the vicinity of the Project. The NHI review confirmed the absence of known hibernacula within 0.25 mile and the absence of known roost trees within 150 feet of both route options.

Based on desktop review, the East Route option would require the removal of approximately 48.4 acres of trees, and the West Route option would require the removal of approximately 46.6 acres of trees. Tree clearing activities may take place prior to October 1, 2020. As such, Xcel Energy will rely on the programmatic Biological Opinion developed by USFWS on January 5, 2016 to fulfill section 7 consultation for this species. The Northern Long-eared Bat 4(d) Rule Streamlined Consultation Form will be submitted to your office after the final route is ordered, and a minimum of 30 days prior to construction. Therefore, we believe the Project *may affect* the northern long-eared bat, *but incidental take is not prohibited*.

Xcel Energy respectfully requests USFWS concurrence with a *not likely to adversely affect* finding for the federally protected Canada lynx and gray wolf, and a *may affect but incidental take is not prohibited* finding for the northern long-eared bat.

Xcel Energy will re-consult with your office if the scope or schedule of the proposed project changes or if new species are listed between now and project initiation. If you have any questions or comments you would like to discuss, please contact me at (612) 330-6073 or ellen.l.heine@xcelenergy.com. We look forward to your input.

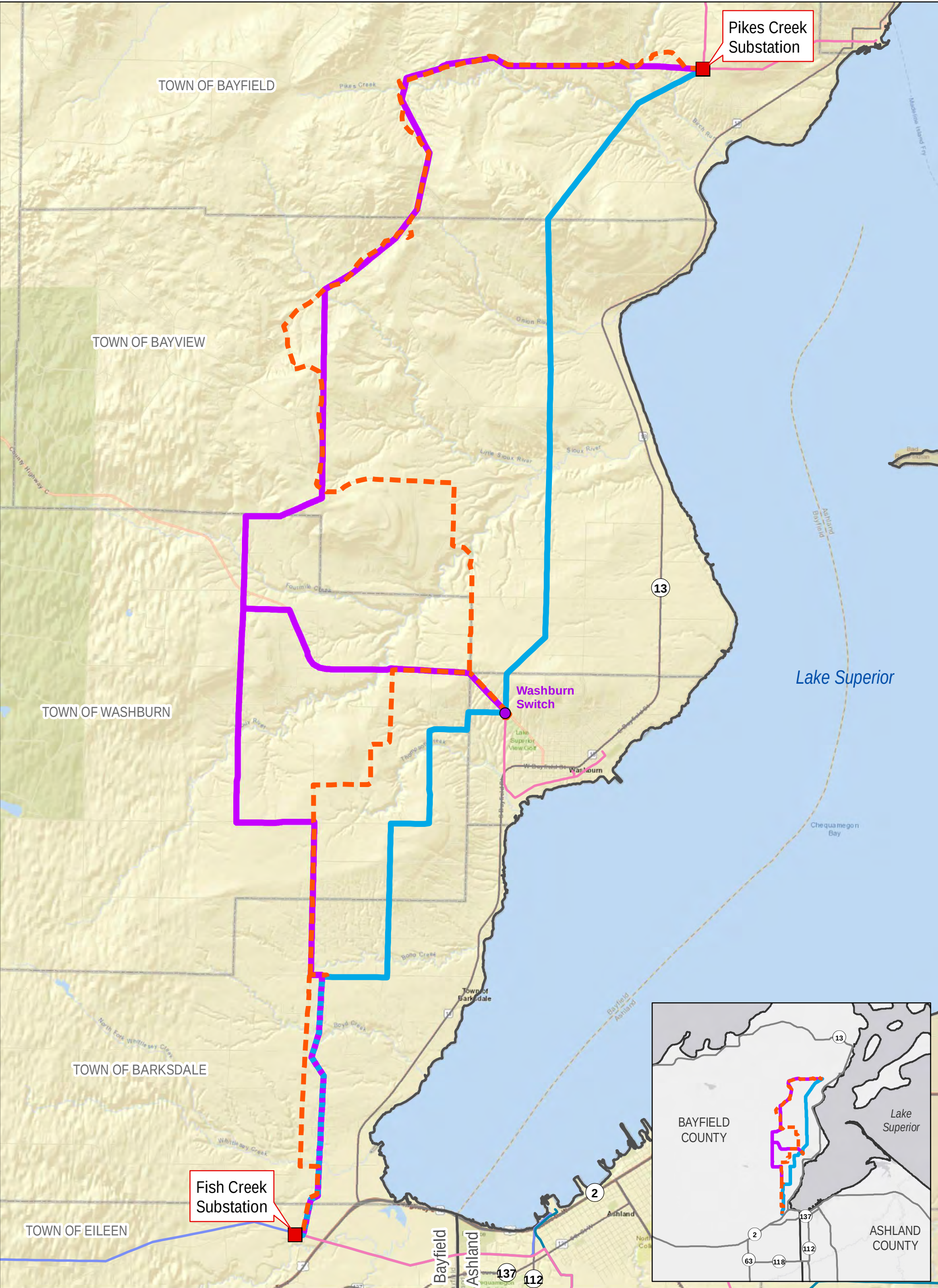
Sincerely,



Ellen Heine
Sr. Land Agent, Siting and Land Rights
Xcel Energy

Enclosures: Project Location Map

Cc: Angela Durand, Merjent, Inc.



PROJECT LOCATION

BAYFIELD SECOND CIRCUIT TRANSMISSION LINE PROJECT

JANUARY 2018

This information is believed to be correct, but is subject to change and carries no warranty. It is intended for reference purposes only. Applicant owned and operated facility locations are approximate. Data courtesy of Xcel Energy, ESRI, WDNR, Merjent, NPMS and ATC.

Proposed Substations

West Route

East Route

Bypass Lines

Township

County

Existing Transmission Lines

34.5 kV

88 kV

115 kV

0

0.5

1

2 Miles

Naomi Christenson

From: Horton, Andrew <andrew_horton@fws.gov>
Sent: Tuesday, January 29, 2019 8:50 AM
To: Heine, Ellen L
Cc: Brie Anderson; Naomi Christenson; Angela Durand
Subject: Re: [EXTERNAL] request for informal section 7 for transmission line project in Bayfield Co. WI

Ellen,

I do not see any significant issues regarding this project. Forest impacts are not anticipated and any temporary disturbance for these highly mobile species would be insignificant or discountable, at most. I will leave the rest up to the U.S. Corps of Engineers when they are ready to determine how they want to move forward, unless there is another federal action agency involved.

- Andrew



Andrew Horton
U.S. Fish and Wildlife Service
Minnesota-Wisconsin Field Office
4101 American Blvd East
Bloomington, MN 55425-1665
(952) 252-0092, ext. 208

On Tue, Jan 15, 2019 at 2:48 PM Heine, Ellen L <Ellen.L.Heine@xcelenergy.com> wrote:

Andrew,

Attached is a letter with associated project map showing the results of an endangered resources review for a proposed transmission line project in Bayfield County, called the Bayfield Second Circuit Transmission Line Project. We are working on finalizing our application to the Wisconsin Public Services Commission and plan to file it soon. We have two potential/proposed routes that will be submitted and the protected species review includes both. We expect it to take up to 6-9 months until the PSC orders one of those routes, but wanted to contact you now to review the potential impacts for each and get your feedback.

I apologize for sending this while you may be on furlough. If you are out at this time I will plan to follow up with you once the government is back in business.

Thanks,

Ellen

Ellen Heine

Xcel Energy | Responsible By Nature

Sr. Land Agent

414 Nicollet Mall, 414-6A, Minneapolis, MN 55401

P: 612.330.6073 F: 612.318.4298

E: ellen.l.heine@xcelenergy.com

Tribal Correspondence



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Richard Peterson
Chairman
Red Cliff Band of Lake Superior Chippewa
88455 Pike Road
Bayfield, WI 54814

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Richard Peterson:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

Xcel Energy has identified two potential routes between the proposed substations: the East Route and West Route. The East Route would be constructed as a double-circuit with an existing 34.5 kV transmission line (100-foot-wide right-of-way) and utilize a temporary bypass transmission line in a separate corridor during construction of the new line to avoid power outages. The West Route would be mainly a single-circuit line, following existing roads to the extent possible, and would utilize a 50-foot-wide right-of-way. Both routes share a common segment at the south end. The attached map depicts the Project’s routes and proposed substations. More information about the project is also available on the Project website at XcelEnergy.com/Bayfield.

Xcel Energy intends to file a Certificate of Authority Application, in accordance with the Application Filing Requirements for Transmission Line and Substation projects to the Public Service Commission of Wisconsin (“PSCW”) for the Project by the end of 2018. As part of this process, Xcel Energy has conducted public meetings, including a routing workshop for interested landowners. The routes depicted here represent the two best route options based on landowner feedback, engineering constraints, and costs. The PSCW will determine which route is to be constructed.

Xcel Energy will continue to coordinate with applicable regulatory and government offices. We appreciate your assistance as we work through the PSCW’s approval process; therefore, please let us know if you have information we should consider.

If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Laura Gordon
Executive Secretary
Red Cliff Band of Lake Superior Chippewa
88455 Pike Road
Bayfield, WI 54814

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Laura Gordon:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Xcel Energy will continue to coordinate with applicable regulatory and government offices. We appreciate your assistance as we work through the PSCW’s approval process; therefore, please let us know if you have information we should consider.

If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Jeff Benton
Transportation Planner
Red Cliff Band of Lake Superior Chippewa
88455 Pike Road
Bayfield, WI 54814

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Jeff Benton:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Johanna Wilson
Administrative Assistant
Red Cliff Band of Lake Superior Chippewa
88455 Pike Road
Bayfield, WI 54814

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Johanna Wilson:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

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414 Nicollet Mall
Minneapolis, MN 55401

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Xcelenergy.com

October 29, 2018

Marvin Dafoe
Tribal Historic Preservation Officer
Red Cliff Band of Lake Superior Chippewa
88455 Pike Road
Bayfield, WI 54814

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Marvin Dafoe:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Chad Abel
Red Cliff Band of Lake Superior Chippewa
88455 Pike Road
Bayfield, WI 54815

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Chad Abel:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Betty Kerr
Tribal Planner
Red Cliff Band of Lake Superior Chippewa
88455 Pike Road
Bayfield, WI 54815

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Betty Kerr:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map

State Correspondence



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Adam Ingwell
Environmental Affairs Coordinator - Supervisor
Public Service Commission of Wisconsin
PO Box 7854
Madison, WI 53705

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Adam Ingwell:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Jim Lepinski
PSC Docket Coordinator
Public Service Commission of Wisconsin
610 North Whitney Way, 2nd Floor
Madison, WI 53705

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Jim Lepinski:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Chip Brown
State Historic Preservation Officer
State Historic Preservation Office
816 State St.
Madison, WI 53706

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Chip Brown:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Kathleen Angel
Program and Planning Analyst
Wisconsin Coastal Management Program
101 East Wilson Street, 9th Floor
Madison, WI 53708

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Kathleen Angel:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Ben Callan
Section Chief
Wisconsin Department of Natural Resources
101 S. Webster St.
Madison, WI 53703

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Ben Callan:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

David Lindsley
Property Manager, South Shore Lake Superior FWA
Wisconsin Department of Natural Resources
2501 Golf Course Rd
Ashland, WI 54806

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear David Lindsley:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Lindsay Tekler
Waterway and Wetland Permits
Wisconsin Department of Natural Resources
101 S. Webster St.
Madison, WI 53703

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Lindsay Tekler:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Xcelenergy.com

October 29, 2018

Steven Bade
Real Estate Specialist
Wisconsin Department of Natural Resources
2501 Golf Course Rd
Ashland, WI 54806

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Steven Bade:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

Xcel Energy has identified two potential routes between the proposed substations: the East Route and West Route. The East Route would be constructed as a double-circuit with an existing 34.5 kV transmission line (100-foot-wide right-of-way) and utilize a temporary bypass transmission line in a separate corridor during construction of the new line to avoid power outages. The West Route would be mainly a single-circuit line, following existing roads to the extent possible, and would utilize a 50-foot-wide right-of-way. Both routes share a common segment at the south end. The attached map depicts the Project’s routes and proposed substations. More information about the project is also available on the Project website at XcelEnergy.com/Bayfield.

Xcel Energy intends to file a Certificate of Authority Application, in accordance with the Application Filing Requirements for Transmission Line and Substation projects to the Public Service Commission of Wisconsin (“PSCW”) for the Project by the end of 2018. As part of this process, Xcel Energy has conducted public meetings, including a routing workshop for interested landowners. The routes depicted here represent the two best route options based on landowner feedback, engineering constraints, and costs. The PSCW will determine which route is to be constructed.

Xcel Energy will continue to coordinate with applicable regulatory and government offices. We appreciate your assistance as we work through the PSCW’s approval process; therefore, please let us know if you have information we should consider.

If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Heidi Nelson
Federal Aid Coordinator
Wisconsin Department of Natural Resources
101 S Webster St.
Madison, WI 53707

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Heidi Nelson:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Angela White
Conservation Biologist
Wisconsin Department of Natural Resources (Endangered Resources)
101 S. Webster St.
Madison, WI 53703

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Angela White:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Kimberly Gonzalez
Water Resource Engineer
Wisconsin Department of Natural Resources (Storm Water Pollution Prevention Plan/Construction)
101 S. Webster St.
Madison, WI 53703

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Kimberly Gonzalez:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Steve LaValley
Water Regulations and Zoning Specialist
Wisconsin Department of Natural Resources (Wetlands and Waterways)
1701 N 4th St.
Superior, WI 54880

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Steve LaValley:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Chris Michels
Land Division Reviewer (Northwest Region)
Wisconsin Department of Transportation
718 W. Clairemont Ave.
Eau Claire, WI 54701

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Chris Michels:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Daniel Anderson
Land Division Reviewer (Northwest Region)
Wisconsin Department of Transportation
W7102 Green Valley Rd.
Spooner, WI 54801

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Daniel Anderson:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Sue Heller
Utility Coordinator
Wisconsin Department of Transportation
1701 N 4th St. Ste. 3
Superior, WI 54880

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Sue Heller:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

Via Email: Alice.Halpin@wisconsin.gov

November 7, 2018

Agricultural Impact Statements Program
Wisconsin Department of Agriculture, Trade and Consumer Protection
Attn: Alice Halpin
2811 Agriculture Drive
P.O. Box 8911
Madison, WI 53708-8911

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Ms. Halpin:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map

Brie Anderson

From: Halpin, Alice L - DATCP <Alice.Halpin@wisconsin.gov>
Sent: Wednesday, November 7, 2018 1:05 PM
To: Heine, Ellen L
Cc: Brie Anderson; Naomi Christenson
Subject: RE: Bayfield Second Circuit Transmission Project

Hi Ellen.

Any electric line project that is less than 100 kV is exempt from the Ag Impact Statement program. There are a few other exemptions, but the 100 kV threshold is the primary one in this case.

Let me know if you have any questions. I hope all is well.

Alice

Alice Halpin
Agricultural Impact Statements Program, Division of Agricultural Resource Management
Wisconsin Department of Agriculture, Trade and Consumer Protection
P.O. Box 8911
Madison, WI 53708-8911
phone: (608)224-4646
fax: (608)224-4615
e-mail: alice.halpin@wisconsin.gov

Please complete this [brief survey](#) to help us improve our customer service. Thank you for your feedback.

alice.halpin@wisconsin.gov[brief survey](#)

From: Heine, Ellen L <Ellen.L.Heine@xcelenergy.com>
Sent: Wednesday, November 7, 2018 12:32 PM
To: Halpin, Alice L - DATCP <Alice.Halpin@wisconsin.gov>
Cc: Brie Anderson (banderson@merjent.com) <banderson@merjent.com>; Naomi K. Christenson <NChristenson@Merjent.com>
Subject: Bayfield Second Circuit Transmission Project

Hi Alice,

We are working on putting together an application for a Certificate of Authority for a proposed transmission line in Bayfield County, WI: the Bayfield Second Circuit Transmission Project. Attached is a letter about the project and a map showing the location of the route options. We wanted to send this to you for your review and to find out if you feel that an Agricultural Impact Statement will be needed for the project. We are not done crunching all the data yet, but in general there is a lot of forested land up there and just a little bit of ag. If you want more specifics Merjent can help pull numbers together.

Please let me know your thoughts, or if you have questions or need more information.

Thanks,

Ellen

Ellen Heine

Xcel Energy | Responsible By Nature

Sr. Land Agent

414 Nicollet Mall, 414-6A, Minneapolis, MN 55401

P: 612.330.6073 F: 612.318.4298

E: ellen.l.heine@xcelenergy.com

Local Correspondence

Town of Bayfield

85450 County Highway J
Bayfield, WI 54814

Telephone (715)779-5671

Fax (715)779-5681

Website www.townofbayfield.com

E-mail bayfieldtownclerk@centurytel.net

Thomas J Gordon-Chairman
Gerald Carlson-Vice Chairman

Kelly Faye -Clerk
Dave Good- Deputy Clerk

Larry Weber-Treasurer
Joel Weber-Deputy Treasurer

November 28, 2017

Chris Buboltz, Project Manager
Bayfield Second Circuit Transmission Project
Xcel Energy
414 Nicollet Mall (6)
Minneapolis, MN 55401

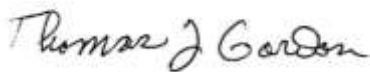
Dear Chris:

We are sending you this correspondence to give input on the Bayfield Second Circuit Transmission Project. After discussing the project with the Chairman of the Town of Bayfield's Plan Commission Jack Beagan, it was decided that I would send correspondence to you in regards to the transmission line that intersects Star Route Road at Jammer Hill Road and continues east towards Bayfield to the Pikes Creek Substation Site.

It has been the desire of the Bayfield Town Board and Plan Commission to make Star Route a scenic drive. This large transmission line with a 50 ft. right-of-way would hinder that scenic route. We hope that an alternative such as burying the lines can be sought to make the aesthetics more pleasing. The Town of Bayfield and its residents rely heavily on tourism and those that come to enjoy the many farms, Big Top Chautauqua, and the Lake Superior area.

We realize that the Town of Bayfield area would be one of the benefactors of the increased power and want to work with Xcel in accomplishing both the increase in power and preserving the aesthetics of this beautiful scenic route. I want to thank you for your cooperation in this matter. Please feel free to contact me at 715-779-3130 or Jack Beagan at 715-209-3261.

Sincerely,



Thomas J. Gordon – Chairman
TOWN OF BAYFIELD

cc: Jim Steffenson
Demaris Brinton
Robert Feyen
Susan Hall



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Sjana Schanning
President
Bad River Watershed District
P.O. Box 875
Ashland, WI 54806

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Sjana Schanning:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Jason Bodine
Administrator - Forestry and Parks
Bayfield County
PO Box 878
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Jason Bodine:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Mark Abeles-Allison
Administrator
Bayfield County
PO Box 878
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Mark Abeles-Allison:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Brett T. Rondeau
Supervisory District 13
Bayfield County Board of Supervisors
40360 Cable Sunset Rd.
Cable, WI 54821

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Brett T. Rondeau:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

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Xcelenergy.com

October 29, 2018

George P. Newago
Supervisory District 1
Bayfield County Board of Supervisors
34520 Blueberry Road
Bayfield, WI 54814

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear George P. Newago:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

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Xcelenergy.com

October 29, 2018

Dennis M. Pocernich
Chair, Supervisory District 7
Bayfield County Board of Supervisors
71115 Ondossagon Rd.
Ashland, WI 54806

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Dennis M. Pocernich:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

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October 29, 2018

Fred Strand
Vice-Chair, Supervisory District 8
Bayfield County Board of Supervisors
3420 Strand Rd.
Iron River, WI 54847

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Fred Strand:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

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Xcelenergy.com

October 29, 2018

Harold A. Maki
Supervisory District 4
Bayfield County Board of Supervisors
3420 Strand Rd.
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Harold A. Maki:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

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Xcelenergy.com

October 29, 2018

James A. Crandall
Supervisory District 12
Bayfield County Board of Supervisors
10860 N. Loop Road
Drummond, WI 54832

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear James A. Crandall:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

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Xcelenergy.com

October 29, 2018

Jeffery Silbert
Supervisory District 6
Bayfield County Board of Supervisors
502 E. 4th St.
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Jeffery Silbert:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Jeremy Oswald
Supervisory District 5
Bayfield County Board of Supervisors
401 W. 5th St.
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Jeremy Oswald:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Enclosure: Project Location Map



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Minneapolis, MN 55401

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Xcelenergy.com

October 29, 2018

Larry Fickbohm
Supervisory District 3
Bayfield County Board of Supervisors
79730 Evergreen Rd.
Port Wing, WI 54865

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Larry Fickbohm:

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Marty Milanowski
Supervisory District 10
Bayfield County Board of Supervisors
66040 US Hwy 63
Mason, WI 54856

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Marty Milanowski:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Enclosure: Project Location Map



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Minneapolis, MN 55401

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Xcelenergy.com

October 29, 2018

David A. Zepczyk
Supervisory District 11
Bayfield County Board of Supervisors
30015 Co Hwy E
Mason, WI 54856

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear David A. Zepczyk:

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

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Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Thomas Snilsberg
Supervisory District 9
Bayfield County Board of Supervisors
67275 Shady Oak Drive
Iron River, WI 54847

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Thomas Snilsberg:

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414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Thomas J. Gordon
Supervisory District 2
Bayfield County Board of Supervisors
27050 Star Route
Bayfield, WI 54814

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Thomas J. Gordon:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Xcel Energy intends to file a Certificate of Authority Application, in accordance with the Application Filing Requirements for Transmission Line and Substation projects to the Public Service Commission of Wisconsin (“PSCW”) for the Project by the end of 2018. As part of this process, Xcel Energy has conducted public meetings, including a routing workshop for interested landowners. The routes depicted here represent the two best route options based on landowner feedback, engineering constraints, and costs. The PSCW will determine which route is to be constructed.

Xcel Energy will continue to coordinate with applicable regulatory and government offices. We appreciate your assistance as we work through the PSCW’s approval process; therefore, please let us know if you have information we should consider.

If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Rob Schierman
Director
Bayfield County Planning and Zoning
117 E. Fifth St.
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Rob Schierman:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

April Kroner
Director of Planning and Development
City of Ashland
601 Main St. W.
Ashland, WI 54806

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear April Kroner:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Deb Lewis
Mayor
City of Ashland
601 Main St. W.
Ashland, WI 54806

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Deb Lewis:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

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Xcelenergy.com

October 29, 2018

Denise Oliphant
City Clerk
City of Ashland
601 Main St. W.
Ashland, WI 54806

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Denise Oliphant:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

City Administrator
City of Ashland
601 Main St. W.
Ashland, WI 54806

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear City Administrator:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Raymond Hyde
Public Works Director
City of Ashland
2020 6th St. E.
Ashland, WI 54806

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Raymond Hyde:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Holly George
City Councilors - Ward 1
City of Ashland
2812 Fellman Drive
Ashland, WI 54806

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Holly George:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Richard Ketring
City Councilors - Ward 2
City of Ashland
504 10th Avenue West
Ashland, WI 54807

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Richard Ketring:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Sarah Jackson
City Councilors - Ward 3
City of Ashland
701 12th Avenue West
Ashland, WI 54808

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Sarah Jackson:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Kate Ullman
City Councilors - Ward 4
City of Ashland
1222 9th Avenue West
Ashland, WI 54809

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Kate Ullman:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Ana Tochtermann
City Councilors - Ward 5
City of Ashland
818 Vaughn Avenue
Ashland, WI 54810

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Ana Tochtermann:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

David Mettelle
City Councilors - Ward 6
City of Ashland
608 Chapple Avenue
Ashland, WI 54811

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear David Mettelle:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Minneapolis, MN 55401

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October 29, 2018

Kevin Haas
City Councilors - Ward 7
City of Ashland
801 Ellis Avenue
Ashland, WI 54812

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Kevin Haas:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

Xcel Energy has identified two potential routes between the proposed substations: the East Route and West Route. The East Route would be constructed as a double-circuit with an existing 34.5 kV transmission line (100-foot-wide right-of-way) and utilize a temporary bypass transmission line in a separate corridor during construction of the new line to avoid power outages. The West Route would be mainly a single-circuit line, following existing roads to the extent possible, and would utilize a 50-foot-wide right-of-way. Both routes share a common segment at the south end. The attached map depicts the Project’s routes and proposed substations. More information about the project is also available on the Project website at XcelEnergy.com/Bayfield.

Xcel Energy intends to file a Certificate of Authority Application, in accordance with the Application Filing Requirements for Transmission Line and Substation projects to the Public Service Commission of Wisconsin (“PSCW”) for the Project by the end of 2018. As part of this process, Xcel Energy has conducted public meetings, including a routing workshop for interested landowners. The routes depicted here represent the two best route options based on landowner feedback, engineering constraints, and costs. The PSCW will determine which route is to be constructed.

Xcel Energy will continue to coordinate with applicable regulatory and government offices. We appreciate your assistance as we work through the PSCW’s approval process; therefore, please let us know if you have information we should consider.

If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Charlie Ortman
City Councilors - Ward 8
City of Ashland
708 Ellis Avenue
Ashland, WI 54813

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Charlie Ortman:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Elizabeth Franek
City Councilors - Ward 9
City of Ashland
407 Willis Avenue
Ashland, WI 54814

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Elizabeth Franek:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Dick Pufall
City Councilors - Ward 10
City of Ashland
1203 Main Street East
Ashland, WI 54815

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Dick Pufall:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Jackie Moore
City Councilors - Ward 11
City of Ashland
307 14th Ave. East
Ashland, WI 54816

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Jackie Moore:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Gordon T. Ringberg
Mayor
City of Bayfield Administration
PO Box 1170
Bayfield, WI 54814

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Gordon T. Ringberg:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Billie Hoopman
City Clerk
City of Bayfield Clerk
PO Box 1170
Bayfield, WI 54814

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Billie Hoopman:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Sheryl Burkel
Common Council - District 2
City of Bayfield Common Council
PO Box 1284
Bayfield, WI 54814

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Sheryl Burkel:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

James Bryan
Common Council - District 1
City of Bayfield Common Council
PO Box 7
Bayfield, WI 54814

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear James Bryan:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Jon C. Nelson
Common Council - District 3
City of Bayfield Common Council
PO Box 1174
Bayfield, WI 54814

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Jon C. Nelson:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Sharon Johnson
Common Council - District 4
City of Bayfield Common Council
PO Box 406
Bayfield, WI 54814

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Sharon Johnson:

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Thomas Kovachevich
Public Works Director
City of Bayfield Public Works
125 S First St.
Bayfield, WI 54814

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Thomas Kovachevich:

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Dionne Johnston
Utility Clerk/Deputy Zoning Administrator
City of Bayfield Utility Clerk and Zoning
125 S First St.
Bayfield, WI 54814

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Dionne Johnston:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Richard Avol
Mayor
City of Washburn Mayor
119 Washington Ave.
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Richard Avol:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

Xcel Energy has identified two potential routes between the proposed substations: the East Route and West Route. The East Route would be constructed as a double-circuit with an existing 34.5 kV transmission line (100-foot-wide right-of-way) and utilize a temporary bypass transmission line in a separate corridor during construction of the new line to avoid power outages. The West Route would be mainly a single-circuit line, following existing roads to the extent possible, and would utilize a 50-foot-wide right-of-way. Both routes share a common segment at the south end. The attached map depicts the Project’s routes and proposed substations. More information about the project is also available on the Project website at XcelEnergy.com/Bayfield.

Xcel Energy intends to file a Certificate of Authority Application, in accordance with the Application Filing Requirements for Transmission Line and Substation projects to the Public Service Commission of Wisconsin (“PSCW”) for the Project by the end of 2018. As part of this process, Xcel Energy has conducted public meetings, including a routing workshop for interested landowners. The routes depicted here represent the two best route options based on landowner feedback, engineering constraints, and costs. The PSCW will determine which route is to be constructed.

Xcel Energy will continue to coordinate with applicable regulatory and government offices. We appreciate your assistance as we work through the PSCW’s approval process; therefore, please let us know if you have information we should consider.

If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Scott J. Kluver
City Administrator/Clerk
City of Washburn Administration/Clerk
119 Washington Ave.
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Scott J. Kluver:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Kay Bratley
Deputy Clerk/Treasurer
City of Washburn Clerk
119 Washington Ave.
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Kay Bratley:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Jennifer Maziasz
District 2 Ward 2/3 Council Member
City of Washburn Council
26 E 3rd Street
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Jennifer Maziasz:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Jeremy Oswald
District 3 Ward 4 Council Member
City of Washburn Council
PO Box 551
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Jeremy Oswald:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

John Gary
District 1 Ward 1 Council Member
City of Washburn Council
506 East 4th St
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear John Gary:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Mary McGrath
District 1 Ward 1 Council President
City of Washburn Council
111 South 3rd Ave East
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Mary McGrath:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Linda Barnes
District 2 Ward 2/3 Council Member
City of Washburn Council
5 West 3rd Street
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Linda Barnes:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Aaron Austin
District 3 Ward 4 Council Member
City of Washburn Council
309 9th Ave. West
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Aaron Austin:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Karen Spears Novachek
Councilor At Large
City of Washburn Council
610 East 4th Street
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Karen Spears Novachek:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Gayla Salmi
Director
City of Washburn Public Works
PO Box 638
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Gayla Salmi:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Dennis M. Pocernich
Chair
Town of Barksdale Chair
71115 Ondossagon Rd.
Ashland, WI 54806

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Dennis M. Pocernich:

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Lynn M. Divine
Clerk
Town of Barksdale Clerk
28090 Cherryville Rd
Ashland, WI 54806

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Lynn M. Divine:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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October 29, 2018

Chris Breting
Supervisor
Town of Barksdale Supervisor
29890 Nolander Rd
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Chris Breting:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Xcel Energy intends to file a Certificate of Authority Application, in accordance with the Application Filing Requirements for Transmission Line and Substation projects to the Public Service Commission of Wisconsin (“PSCW”) for the Project by the end of 2018. As part of this process, Xcel Energy has conducted public meetings, including a routing workshop for interested landowners. The routes depicted here represent the two best route options based on landowner feedback, engineering constraints, and costs. The PSCW will determine which route is to be constructed.

Xcel Energy will continue to coordinate with applicable regulatory and government offices. We appreciate your assistance as we work through the PSCW’s approval process; therefore, please let us know if you have information we should consider.

If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

John Nyara
Supervisor
Town of Barksdale Supervisor
73430 Ondossagon Rd
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear John Nyara:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Susan M. Sanders
Treasurer
Town of Barksdale Treasurer
71730 Range Rd
Ashland, WI 54806

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Susan M. Sanders:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Charly Ray
Town Chairman
Town of Bayview
32800 Burlager Rd
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Charly Ray:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Don Jenicek
Town Supervisor
Town of Bayview
32800 Burlager Rd
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Don Jenicek:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Kelly Warren
Town Treasurer
Town of Bayview
32800 Burlager Rd
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Kelly Warren:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Larry Nelson
Town Supervisor
Town of Bayview
32800 Burlager Rd
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Larry Nelson:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Wanda Hyde
Town Clerk
Town of Bayview
32800 Burlager Rd
Washburn, WI 54891

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Wanda Hyde:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Janice Olson
Supervisor
Town of Bell (Cornucopia)
21955 Old Hwy 13
Cornucopia, WI 54827

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Janice Olson:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Lynda Nedden-Durst
Treasurer
Town of Bell (Cornucopia)
21475 State Hwy 13
Cornucopia, WI 54827

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Lynda Nedden-Durst:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

MaryBeth Tillmans
Clerk
Town of Bell (Cornucopia)
P.O. Box 116
Cornucopia, WI 54827

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear MaryBeth Tillmans:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Matt Lazorik
Chairman
Town of Bell (Cornucopia)
22205 St. Hwy 13
Cornucopia, WI 54827

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Matt Lazorik:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Mike O'Bryon
Supervisor
Town of Bell (Cornucopia)
P.O. Box 305
Cornucopia, WI 54827

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Mike O'Bryon:

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Vicki Lewis-Hay
Supervisor
Town of Bell (Cornucopia)
22560 Elm
Cornucopia, WI 54827

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Vicki Lewis-Hay:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

Xcel Energy has identified two potential routes between the proposed substations: the East Route and West Route. The East Route would be constructed as a double-circuit with an existing 34.5 kV transmission line (100-foot-wide right-of-way) and utilize a temporary bypass transmission line in a separate corridor during construction of the new line to avoid power outages. The West Route would be mainly a single-circuit line, following existing roads to the extent possible, and would utilize a 50-foot-wide right-of-way. Both routes share a common segment at the south end. The attached map depicts the Project’s routes and proposed substations. More information about the project is also available on the Project website at XcelEnergy.com/Bayfield.

Xcel Energy intends to file a Certificate of Authority Application, in accordance with the Application Filing Requirements for Transmission Line and Substation projects to the Public Service Commission of Wisconsin (“PSCW”) for the Project by the end of 2018. As part of this process, Xcel Energy has conducted public meetings, including a routing workshop for interested landowners. The routes depicted here represent the two best route options based on landowner feedback, engineering constraints, and costs. The PSCW will determine which route is to be constructed.

Xcel Energy will continue to coordinate with applicable regulatory and government offices. We appreciate your assistance as we work through the PSCW’s approval process; therefore, please let us know if you have information we should consider.

If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Yvette Fleming
Supervisor
Town of Bell (Cornucopia)
P.O. Box 225
Cornucopia, WI 54827

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Yvette Fleming:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Barbara Rebak
Supervisor
Town of Clover (Herbster)
14515 St. Hwy 13
Herbster, WI 54844

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Barbara Rebak:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Bev Steele
Chairperson
Town of Clover (Herbster)
88775 Bark Point Rd.
Herbster, WI 54844

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Bev Steele:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Cynthia Hepner
Treasurer
Town of Clover (Herbster)
14515 Cranberry River Rd.
Herbster, WI 54844

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Cynthia Hepner:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Jack Smith
Supervisor
Town of Clover (Herbster)
86845 Lenawee Rd.
Herbster, WI 54844

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Jack Smith:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Merv Shaffer
Supervisor
Town of Clover (Herbster)
14845 Willow St.
Herbster, WI 54844

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Merv Shaffer:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Patti Stemwedel
Supervisor
Town of Clover (Herbster)
16205 US Hwy 13
Herbster, WI 54844

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Patti Stemwedel:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Tracy Gillespey
Clerk
Town of Clover (Herbster)
P.O. Box 94
Herbster, WI 54844

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Tracy Gillespey:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Marty Milanowski
Chair
Town of Eileen Chairman
66040 US Hwy 2
Mason, WI 54806

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Marty Milanowski:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Crystal Mattson
Clerk
Town of Eileen Clerk
28045 Co Hwy G
Ashland, WI 54806

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Crystal Mattson:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Helen Hyde
Clerk/Treasurer
Town of Iron River
P.O. Box 485
Iron River, WI 54847

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Helen Hyde:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

John Rautio
Supervisor
Town of Iron River
P.O. Box 144
Iron River, WI 54847

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear John Rautio:

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Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



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Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Lori Anderson
Supervisor
Town of Iron River
68515 Lea St.
Iron River, WI 54847

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Lori Anderson:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

Xcel Energy has identified two potential routes between the proposed substations: the East Route and West Route. The East Route would be constructed as a double-circuit with an existing 34.5 kV transmission line (100-foot-wide right-of-way) and utilize a temporary bypass transmission line in a separate corridor during construction of the new line to avoid power outages. The West Route would be mainly a single-circuit line, following existing roads to the extent possible, and would utilize a 50-foot-wide right-of-way. Both routes share a common segment at the south end. The attached map depicts the Project’s routes and proposed substations. More information about the project is also available on the Project website at XcelEnergy.com/Bayfield.

Xcel Energy intends to file a Certificate of Authority Application, in accordance with the Application Filing Requirements for Transmission Line and Substation projects to the Public Service Commission of Wisconsin (“PSCW”) for the Project by the end of 2018. As part of this process, Xcel Energy has conducted public meetings, including a routing workshop for interested landowners. The routes depicted here represent the two best route options based on landowner feedback, engineering constraints, and costs. The PSCW will determine which route is to be constructed.

Xcel Energy will continue to coordinate with applicable regulatory and government offices. We appreciate your assistance as we work through the PSCW’s approval process; therefore, please let us know if you have information we should consider.

If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Maureen Johnson
Deputy Clerk
Town of Iron River
66284 Hart Lake Rd.
Iron River, WI 54847

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Maureen Johnson:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Michelle Davis
Supervisor
Town of Iron River
68240 S. Bohn St.
Iron River, WI 54847

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Michelle Davis:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Xcel Energy will continue to coordinate with applicable regulatory and government offices. We appreciate your assistance as we work through the PSCW’s approval process; therefore, please let us know if you have information we should consider.

If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Steve Probst
Town Chairman
Town of Iron River
7965 Ridge Rd.
Iron River, WI 54847

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Steve Probst:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Wayne "Rusty" Williams
Supervisor
Town of Iron River
P.O. Box 425
Iron River, WI 54847

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Wayne "Rusty" Williams:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt ("kV") transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; "Project"). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Dwight Johnson
Chairman
Town of Port Wing
8435 St. Hwy. 13
Port Wing, WI 54865

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Dwight Johnson:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Eleanora Tribys
Treasurer
Town of Port Wing
P.O. Box 43
Port Wing, WI 54865

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Eleanora Tribys:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Gary Williams
Supervisor
Town of Port Wing
82525 Gustafson Rd.
Port Wing, WI 54865

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Gary Williams:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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If you have questions or would like additional information on the proposed Project, please contact me at Ellen.L.Heine@xcelenergy.com or (612) 330-6073. We look forward to your input and appreciate your assistance.

Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Marjorie Ogren
Clerk
Town of Port Wing
P.O. Box 28
Port Wing, WI 0

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Marjorie Ogren:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map



414 Nicollet Mall
Minneapolis, MN 55401

1-800-895-4999
Xcelenergy.com

October 29, 2018

Russell Bailey
Supervisor
Town of Port Wing
P.O. Box 126
Port Wing, WI 54865

**Re: 34.5 kV Bayfield Second Circuit Project
Bayfield County, Wisconsin**

Dear Russell Bailey:

Northern States Power Company – Wisconsin, an Xcel Energy Company, is proposing to construct a new approximately 20-mile-long, 34.5 kilovolt (“kV”) transmission line within Bayfield County, Wisconsin (Bayfield Second Circuit Project; “Project”). The proposed line will extend from the proposed Fish Creek substation located west of the City of Ashland, to the proposed Pikes Creek substation located west of the Town of Bayfield. The Project was identified by Xcel Energy to minimize outages in the Project area, improve system reliability, and support future electric load growth.

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Sincerely,

Ellen Heine
Sr. Land Agent, Siting and Land Rights

Enclosure: Project Location Map

**COMMON COUNCIL FOR THE
CITY OF WASHBURN, WISCONSIN**

Resolution No. 018-017

Supporting the Eastern Option of the Xcel Energy 34.5 kV Bayfield Second Circuit Project

WHEREAS, the Common Council of the City of Washburn desires to have reliable electrical service provided to the City of Washburn; and

WHEREAS, the Common Council of the City of Washburn has reviewed the options involved with the Xcel Energy 34.5 kV Bayfield Second Circuit Project; and

WHEREAS, the Common Council of the City of Washburn believes that the eastern route with the combined circuit is the least disruptive of the two options presented;

NOW, THEREFORE, BE IT RESOLVED, that the Common Council of the City of Washburn assembled this 12th Day of November, 2018, supports the eastern route of the Xcel Energy 34.5 kV Bayfield Second Circuit Project and encourages the Public Service Commission of Wisconsin to approve this route.

Adopted by the Common Council for the City of Washburn, Wisconsin this 12th Day of November, 2018.



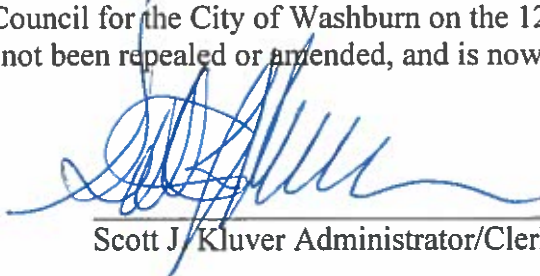
Richard Avol, Mayor

STATE OF WISCONSIN)

)

COUNTY OF BAYFIELD)

I hereby certify that the foregoing resolution is a true, correct and complete copy of a Resolution #18-017 duly and regularly adopted by the Common Council for the City of Washburn on the 12th day of November, 2018 and that said resolution has not been repealed or amended, and is now in full force and effect.



Scott J. Kluver Administrator/Clerk

above expectations
BAYFIELD
C O U N T Y

Resolution

No. 2019-03

SUPPORTING THE EAST ROUTE OPTION OF XCEL ENERGY'S PROPOSED 2nd CIRCUIT TRANSMISSION LINE PROJECT

WHEREAS, in August of 2017, Xcel Energy announced their plan to install a new "Second Circuit" to improve quality and reliability of electrical service for their customers in Bayfield, Washburn and on Madeline Island;

WHEREAS, after receiving input from the Bayfield County community, Xcel Energy reconsidered the routing of the Second Circuit Project and developed an additional routing option for the project. Xcel calls this new route option the East Route, and their original proposal is now the West Route;

WHEREAS, Xcel Energy has stated that both route options meet their objectives for the Second Circuit Project and that they will not indicate to the Public Service Commission preference for one route over the other;

WHEREAS, interested local citizens developed a tool for comparing the impacts of different route options for the project, and the Town Boards of the five affected Townships all endorsed the use of this tool for deciding which route would be preferred;

WHEREAS, application of this route comparison tool shows the East Route to be the preferable option with regard to impacts to the community and local environment;

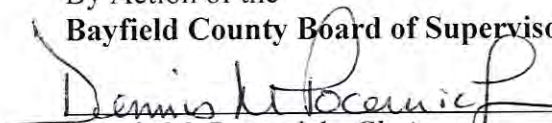
WHEREAS, Township Boards of Eileen, Barksdale, Washburn, Bayview, and Bayfield, and the City Councils of Washburn and Bayfield all considered this, and all went on record in favor of the East Route;

WHEREAS, the East Route will require less new acreage from the Bayfield County Forest inventory;

WHEREAS, on January 14, 2019, the Forestry and Parks Committee voted to endorse the East Route option for the Xcel Energy 2nd Circuit Project and recommended forwarding this resolution to the full Bayfield County Board for their consideration;

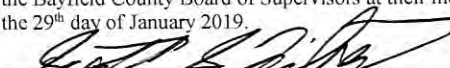
THEREFORE, BE IT RESOLVED, that the Bayfield County Board of Supervisors, assembled this 29th day of January 2019, supports and endorses the East Route option of Xcel Energy's proposed 2nd Circuit Transmission Line project.

By Action of the
Bayfield County Board of Supervisors


Dennis M. Pocernich, *Chairman*

STATE OF WISCONSIN)
)ss.
BAYFIELD COUNTY)

I, Scott S. Fibert, Bayfield County Clerk, hereby certify that the foregoing is a true and correct copy of Volume 26, adopted by the Bayfield County Board of Supervisors at their meeting held on the 29th day of January 2019.


Scott S. Fibert, *Bayfield County Clerk*

APPENDIX G

MAILING LISTS

EXHIBIT 1
Landowner List

Xcel Energy
Bayfield Second Circuit Transmission Line Project
Appendix G - Mailing Lists
Exhibit 1 - Landowner List

Name 1	Address	City	State	Zip
ASHWABAY OUTDOOR EDU FOUND INC	PO BOX 1401	BAYFIELD	WI	54814
BAYFIELD COUNTY	117 E 5TH ST	WASHBURN	WI	54891
BAYFIELD ELECTRIC CO-OP	PO BOX 68	IRON RIVER	WI	54847
BRETTING DEVELOPMENT CORP	3401 LAKE PARK RD	ASHLAND	WI	54806
BREVAK TRUST	74035 ONDOSSAGON RD	WASHBURN	WI	54891
CITY OF WASHBURN	PO BOX 638	WASHBURN	WI	54891
ESTEVAN TRUST	32020 FRIENDLY VALLEY RD	WASHBURN	WI	54891
FAITH BAPTIST CHURCH	10 S 6TH ST	BAYFIELD	WI	54814
HEARTWOOD FORESTLAND FUND VII LTD PTNRSH	200 MICHIGAN ST SUITE 722	HANCOCK	MI	49930
HOPKINS FAMILY PARTNERSHIP	15104 SOUTH COPPERMINE RD	GORDON	WI	54838
J P MORGAN CHASE BANK NA	7301 BAYMEADOWS WAY	JACKSONVILLE	FL	32256
LAKE SUPERIOR BIG TOP CHAUTAUQUA LTD	PO BOX 455	WASHBURN	WI	54891
MESSIAH LUTHERAN CHURCH	PO BOX 396	WASHBURN	WI	54891
NORTHERN STATES POWER	PO BOX 8	EAU CLAIRE	WI	54702
EVERGREEN AMUNDSON, POTTERS FARM INC	73700 ONDOSSAGON RD	WASHBURN	WI	54891
CONSERVATION CONGRESS	PO BOX 7921	MADISON	WI	53707-7921
DEPARTMENT OF TRANSPORTATION	4822 MADISON YARDS WAY	MADISON	WI	53705
DNR	101 S WEBSTER ST	MADISON	WI	53707
TOPSIDE TAVERN LLC	PO BOX 582	WASHBURN	WI	54891
TOWN OF BARKSDALE, SANITARY DISTRICT NO 1	29025 E ONDOSSAGON RD	ASHLAND	WI	54806
TOWN OF BARKSDALE	29025 E ONDOSSAGON RD	ASHLAND	WI	54806
TOWN OF BAYVIEW	32800 BURLAGER RD	WASHBURN	WI	54891
TOWN OF WASHBURN	28345 PAULSON RD	WASHBURN	WI	54891-3800
US FISH AND WILDLIFE SERVICE	5600 AMERICAN BLVD W	BLOOMINGTON	MN	55437-1458
US FOREST SERVICE	500 HANSON LAKE RD	RHINELANDER	WI	54501
VCY AMERICA INC	3434 W KILBOURN AVE	MILWAUKEE	WI	53208
WASHBURN ASSEMBLY OF GOD	PO BOX 632	WASHBURN	WI	54891
WASHBURN SCHOOL DIST NO 1	PO BOX 730	WASHBURN	WI	54891
WHISKEY RIVER LAND & TIMBER LLC	14120 BALLANTYNE CORP PL SUITE 525	CHARLOTTE	NC	28277
AARON J MYOTT	30990 ENGORE RD	WASHBURN	WI	54891
AH LUI WALLACE	29490 CO HWY C	WASHBURN	WI	54891

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Name 1	Address	City	State	Zip
ALAN C APPEL JR	PO BOX 101	BAYFIELD	WI	54814
ALAN E RADLEY	31550 STAR RT RD	BAYFIELD	WI	54814
ALBERT BUSS	71485 ONDOSSAGON RD	ASHLAND	WI	54806
ALEX R AND JENNIFER ANN TORBORG	76325 CHURCH CORNER RD	WASHBURN	WI	54891
ALEX STRACHOTA	PO BOX 920	WASHBURN	WI	54891
ALLEN F AND CAROLYN WESTLING	78495 CHURCH CORNER RD	WASHBURN	WI	54891
AMY LOUISE NORLIN AND ELIZABETH A ZASPEL	2328 SUPERIOR ST	MADISON	WI	53704-4632
ANNI SCHNEIDER	1801 E NORTN WOODSIDE DR	HOLLIDAY	UT	84124-1622
ANTHONY M FISCHER	PO BOX 517	WASHBURN	WI	54891
ARDEN A WEBER	31775 STAR RT RD	BAYFIELD	WI	54814
ASHLEY DAGGETT	632 WESTWYND CT UNIT 1	MAZOMANIE	WI	53560
AXEL L ISAKSSON TRUSTEE	PO BOX 54	HERBSTER	WI	54844
BARRY JAMES STEPHENSON	28860 CO HWY G	ASHLAND	WI	54806
BARRY L AND STEPHANIE A CECH	76400 MCKINLEY RD	WASHBURN	WI	54891
BAYFIELD COUNTY PARK	117 E BAYFIELD ST	WASHBURN	WI	54891
BENTLEY E BREHM	79350 BIG ROCK RD	WASHBURN	WI	54891
BEVERLY A WEBER AND ROBERT D HALVORSON	78285 KOMBORSKI RD	WASHBURN	WI	54891
BLAKE H BRETTING AND MARNIE LOVLIN	30551 WANNEBO RD	WASHBURN	WI	54891
BONNIE R TRAPP ET AL	2412 FRIENDSHIP LN	BURNSVILLE	MN	55337
BRAD S SCHWALEN AND ROBIN C FRANK	811 130TH ST	ROBERTS	WI	54023
BRADFORD J HILTON	308 MINNESOTA ST	EAU CLAIRE	WI	54703
BRIAN J MORABITO	PO BOX 66	ASHLAND	WI	54806
BRIAN K OLSON	76700 MCKINLEY RD	WASHBURN	WI	54891
BRIGID M REINA	77345 OLD C RD	WASHBURN	WI	54891
BROOK W AND SHAWN L MELEK	73645 BJORK RD	WASHBURN	WI	54891
BRUCE J AND JUDITH H DERAUF	3422 E 1ST ST	DULUTH	MN	55804
CAMERON R WILCOX	836 W 3RD ST	WASHBURN	WI	54891
CARL W WICHLIDAL JR	PO BOX 66	ASHLAND	WI	54806
CARLA PADY	PO BOX 223	ELKANDER	IA	52043-0223
CAROL A VALENTINCIC TRUSTEE	2302 CORONA RD	WAUKEGAN	IL	60087
CAROL LEE CORY	3475 AUBURN FOLSUM RD	LOOMIS	CA	95650

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Name 1	Address	City	State	Zip
CARRIE A LINDER	905 N 10TH AVE W	WASHBURN	WI	54891
CHAD E AND J KIANA ABEL	73150 BJORK RD	WASHBURN	WI	54891
CHARLES J CHARETTE AND JENNIFER L DIETRICH	1600 8TH ST W UNIT 45	ASHLAND	WI	54806
CHRISTINE M SHEARMAN	3926 DELOTERO AVE	SPRING PARK	MN	55384
CHRISTOPHER G AND TAMMIE L BRETTING	29890 NOLANDER RD	WASHBURN	WI	54891-5823
CINDY LEE ANDERSEN	31960 STAR ROUTE RD	BAYFIELD	WI	54814
CLARA R AND NANCY PAGAC ET AL	29450 NOLANDER RD	WASHBURN	WI	54891
COLLEEN A JENSEN	1400 CO HWY C	WASHBURN	WI	54891
COREY J NYARA	29125 E ONDOSSAGON RD	ASHLAND	WI	54806
CRAIG W AND BILLIE L HOOPMAN	PO BOX 742	BAYFIELD	WI	54814
CURTIS A AND SUANNE L KLEIN	70175 TERWILLIGER RD	ASHLAND	WI	54806
CURTIS R AND CHARISSA M MYERS	1427 21-1/2 ST	CAMERON	WI	54822
DALE R AND FRANCINE K RECHCYGL	11803 N WAUWATOSA RD	MEQUON	WI	53097
DAN AND CHERYL VITEZ	15074 SCENIC DR	DAYTON	MN	55327
DAN L PETRAS	71150 ONDOSSAGON RD	ASHLAND	WI	54806
DANIEL A AND PATRICIA M HOLMAN	77465 CHURCH CORNER RD	WASHBURN	WI	54891
DANIEL C AND MARK W MAKI	81805 ST HWY 13	WASHBURN	WI	54891
DANIEL L THORESON JR	73810 ONDOSSAGON RD	WASHBURN	WI	54891
DANIEL R AND ERIN C KOVACH	PO BOX 683	WASHBURN	WI	54891
DANIELLE LYNN AND RACHEL A ROSEN ET AL	160 BIRNAMWOOD DR	BURNSVILLE	MN	55337
DARIN C ANDERSON	W2298 RUSTIC RD APT 1	RIB LAKE	WI	54470
DARLENE A LIVINGSTON	1729 KIMBALL ST	ASHLAND	WI	54806
DAVID A AND JUDY D WICKSTROM	727 FOXTREE LN N	NORTH HUDSON	WI	54016
DAVID A AND KARLA J DOWNEY	348 ISLAND DR	SIX MILE	SC	29682
DAVID J AND SHERRY COOK	28800 COOK RD	WASHBURN	WI	54891
DAVID J AND SUSAN L BLONG	PO BOX 415	WASHBURN	WI	54891
DAVID L AND CALLAE K HYDE	30165 CO HWY C	WASHBURN	WI	54891
DAVID M POCERNICH	29310 E ONDOSSAGON RD	ASHLAND	WI	54806
DAVID R AND CARLA KEDROWSKI	77250 BIG ROCK RD	WASHBURN	WI	54891
DAVID R AND TERRI L B BAHE	74265 ONDOSSAGON RD	WASHBURN	WI	54891
DENISE E BOSAK	PO BOX 112	WASHBURN	WI	54891

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Name 1	Address	City	State	Zip
DENISE M TARASEWICZ AND JEFFREY A LIGHTNER	30095 ENGOE RD	WASHBURN	WI	54891
DENNIS E AND MARY H NECHKASH	73185 ONDOSSAGON RD	WASHBURN	WI	54891
DENNIS M AND CATHERINE J POCERNICH	71115 ONDOSSAGON RD	ASHLAND	WI	54806
DENNIS M THOMAS E AND DONALD POCERNICH	23 GROVE BLVD	WASHBURN	WI	54891
DEREK BREVAK	8292 STATE HIGHWAY 80	MARSHFIELD	WI	54449-9673
DIANA K NEWAGO-KNOKE ET AL	424 SECOND ST	NEENAH	WI	54956-2857
DIANN AND JOSEPH J VIATER	31060 ENGOE RD	WASHBURN	WI	54891
DONALD A MATTSON	73915 BJORK RD	WASHBURN	WI	54891
DONALD E WESTLING	78275 CHURCH CORNER RD	WASHBURN	WI	54891
DOUGLAS H AND LEILANI L ANDERSON	74655 ONDOSSAGON RD	WASHBURN	WI	54891
DOUGLAS N AND STEPHANIE A AMENT	PO BOX 111	WASHBURN	WI	54891-0111
DOUGLAS W BORCHERS	75525 MCKINLEY RD	WASHBURN	WI	54891
DUANE WARREN POTTER	79250 N NIEMISTO RD	WASHBURN	WI	54891
EDWARD GRUHL	79001 CHURCH CORNER RD	WASHBURN	WI	54891
ERIC E AND LYNN M ADAMS	30850 HOVE LN	WASHBURN	WI	54891
ERIC P CARLSON ET AL	34045 S CO HWY J	BAYFIELD	WI	54814
ERIC R FOLLIS	PO BOX 733	WASHBURN	WI	54891
ERVAL O JACKSON	28835 S MAPLE HILL RD	WASHBURN	WI	54891
ETTA TESCHNER	76635 CHURCH CORNER RD	WASHBURN	WI	54891
FORD THOMPSON	1724 HILLVIEW RD	MISHICOT	WI	54228
FRANCES M KUESTER	29238 E ONDOSSAGON RD	ASHLAND	WI	54806
FRANKLIN E AND LEE ANN SWAN TRUSTEES	810 FOWLER RD	FULTON	IL	31252
FRED D AND FRED W JOSEPHSON	13 N 5TH ST	BAYFIELD	WI	54814
FREDERIC J AND BARBARA M NYARA	4733 42ND AVE	KENOSHA	WI	53142
GARY AND KIM SWANSON	866 LOUISE RD	NEENAH	WI	54956
GARY AND ROSEANNE BITZER	28985 S MAPLE HILL RD	WASHBURN	WI	54891
GARY D AND DARLENE C THOMPSON	29395 CO HWY C	WASHBURN	WI	54891
GARY L AND KRISTIN F CONNELL TRUSTEES	84800 LAKESHORE DR	BAYFIELD	WI	54814
GARY SCHLICHTING	PO BOX 235	WASHBURN	WI	54891
GEORGE COLUMBINE WILSON AND CYNTHIA CATALANO TRUSTEES	PO BOX 202	NAKNEK	AK	99633

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Name 1	Address	City	State	Zip
GEORGE E AND MARY M SKOGEN	74245 BJORK RD	WASHBURN	WI	54891
GERALD AND ROBERTA SHEARMAN	75840 MCKINLEY RD	WASHBURN	WI	54891
GRACE M HEITSCH	24 N 7TH ST	BAYFIELD	WI	54814
GREGORY E AND DIANE C TETZNER REV LIVING TRUST	30545 NEVERS RD	WASHBURN	WI	54891
GREGORY G AND LISA S STEPHENSON	70190 TERWILLIGER RD	ASHLAND	WI	54806
GREGORY S CABE AND PATRICIA S MCCABE	10177 E OAK RD	POPLAR	WI	54864
HAL C AND MARTY A LIPHART COTRUSTEES	PO BOX 5	WASHBURN	WI	54891
HAROLD A MAKI	85180 ST HWY 13	BAYFIELD	WI	54814
HARRIS H WILKE	PO BOX 297	WALES	WI	53183
HEIDI S WADZINSKI	229 W 3RD ST	WASHBURN	WI	54891
HELEN JANET WATKINS	N5475 TOWER HILL RD	SPOONER	WI	54801
HERMAN E AND NOELLA M SCHUTT TRUSTEES	4723 N KEWANEE	CHICAGO	IL	60630
J D AND C SCHOLL AND S NELSON	29810 SCHOLL RD	WASHBURN	WI	54891
JAMES A HARVEY	78165 CHURCH CORNER RD	WASHBURN	WI	54891
JAMES D AND MARYBETH MCCARTHY	31540 STAR RT RD	BAYFIELD	WI	54814
JAMES F AND VIVIANNA D WHYTE	73475 ONDOSSAGON RD	WASHBURN	WI	54891
JAMES L AND KATHRYN P MILLER	77270 CHURCH CORNER RD	WASHBURN	WI	54891
JAMES M AND MARY SKERIK	75920 ONDOSSAGON RD	WASHBURN	WI	54891
JAMES R AND JOAN E BRATLEY CO-TRUSTEES	31880 FRIENDLY VALLEY RD	WASHBURN	WI	54891
JAMES R AND LAURIE A SCOTT	29115 ENGOW RD	WASHBURN	WI	54891
JAN A AND HEIDI D BITZER REV TRUST	201 SMITH RD	WASHBURN	WI	54891
JANET M WIEBESICK ET AL	4739 HACKAMORE DR N	COLORADO SPRINGS	CO	80918
JASON E RITTER AND JAMEY L PENNEY-RITTER	28655 CO HWY C	WASHBURN	WI	54891
JASON J AND TAMMY D SCHULTE	C2310 EAU PLEINE RD	STRATFORD	WI	54484
JASON R AND GINA M NELSON	913 6TH AVE W	ASHLAND	WI	54806
JASON T WALLAND WENDY A SALIIN	1408 EAST 5TH ST	DULUTH	MN	55805
JAY AND LINDA PRINGLE	30120 FRIENDLY VALLEY RD	WASHBURN	WI	54891
JAY R AND KAREN S STRACHOTA	712 6TH AVE SOUTH	HOPKINS	MN	55343
JEFFREY E FORSBERG	8720 GRACE LN	LORETTA	MN	55357

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Name 1	Address	City	State	Zip
JEFFREY JOSEPH SCHOENECKER	36028 PABST ROAD	OCONOMOWOC	WI	53066
JEFFREY R AND KAREN E BOUTIN	PO BOX 667	BAYFIELD	WI	54814
JEFFREY R AND REBECCA JOHNSON	316 W 6TH ST	WASHBURN	WI	54891
JENNIFER C MAYTUM AND MICHAEL A PARENT	220 LAKE STREET NORTH APT 517	FOREST LAKE	MN	55025
JENNIFER NEWAGO	32200 MCCULLOCH RD	WASHBURN	WI	54891
JEREMY AND CHRISTINA HELWIG AND JOHN W LEHMAN	32420 MCCULLOCH RD	WASHBURN	WI	54891
JERRY L HAUGEN	30855 CO HWY C	WASHBURN	WI	54891
JERRY W FRANK	1605 SUNRISE LN	EAU CLAIRE	WI	54703
JILL J LORENZ	79020 BIG ROCK RD	WASHBURN	WI	54891
JOHN A AND KAREN M SEIDER	11144 KERN LANE	WOODRUFF	WI	54568
JOHN A AND SHANNON D ARBUCKLE	14418 OAKWOOD DR	URBAN DALE	IA	50323
JOHN CHARLES ADAMS	30900 CO HWY C	WASHBURN	WI	54891
JOHN E AND CHRISTINA D SOPIWNIK	77835 KOMBORSKI RD	WASHBURN	WI	54891
JOHN E AND RUTH E HARTZELL	28165 OLD C RD	WASHBURN	WI	54891
JOHN FORTE MAYERS	81280 MCCULLOCH RD	WASHBURN	WI	54891
JOHN H AND NANCY N SCHARDING	PO BOX 305	ELMORE	OH	43416-0305
JOHN J AND PATRICIA A OLSON	30635 CO HWY C	WASHBURN	WI	54891
JOHN L AND FAYE R NYARA	73430 ONDOSSAGON RD	WASHBURN	WI	54891
JON M PADY	74820 BJORK PADY RD	WASHBURN	WI	54891
JONATHAN AND MICHELLE SMALL	1405 BEASER AVE APT 3	ASHLAND	WI	54806
JONATHAN D FALCONER	PO BOX 683	EASTHAM	MA	2692
JONATHAN L AND TIFFANY T TURNER	29745 MCKINLEY RD	WASHBURN	WI	54891
JOSEPH F BELSKY	69765 TERWILLIGER RD	ASHLAND	WI	54806
JOSEPH M AMREIN	28240 WANNEBO RD	WASHBURN	WI	54891
JOSEPH N BRESSETTE	704 N LEA	ROSWELL	NM	88201
JOSEPH S TETZNER	75108 ONDOSSAGON RD	WASHBURN	WI	54891
JOSEPH SLATTERY	N 5503 CO RD ZM	ONALASKA	WI	54650
JOYCE M ZIFKO REV TRUST	27545 S MAPLE HILL RD	WASHBURN	WI	54891
JULIE F VAN STAPPEN	77545 CHURCH CORNER RD	WASHBURN	WI	54891
KAREN HOPKINS	28230 PAULSON RD	WASHBURN	WI	54891

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Name 1	Address	City	State	Zip
KARL R FABER	412 2ND ST W	ASHLAND	WI	54806
KARLA A VINCI	32475 STAR RT RD	BAYFIELD	WI	54814
KATHERINE S JENKINS	PO BOX 1033	WASHBURN	WI	54891
KATHY S AND DANA S NOTEBOOM	31700 STAR RT RD	BAYFIELD	WI	54814
KELLY E POOLE	409 CEDAR ST	BOON	IA	50036
KENNETH AND PHYLLIS DAVIS	76025 CHURCH CORNER RD	WASHBURN	WI	54891
KENNETH C CADOTTE JR AND ALICE CADOTTE	77765 KOMBORSKI RD	WASHBURN	WI	54891-0221
KEVIN M AND JACQUELINE A TETZNER REV LIVING TRUST	30700 NEVERS RD	WASHBURN	WI	54891
KEVIN P AND KERI J STIFTER	1305 E NORTHSTAR LN APT B202	SIOUX FALLS	SD	57108
KHOU XIONG AND PAO C VANG	33593 STAR ROUTE RD	BAYFIELD	WI	54814
KIRBY G AND CAROLYN M KRUEGER	30165 FRIENDLY VALLEY RD	WASHBURN	WI	54891
LARRY AND LYNN WEBER	85080 GOTCHLING RD	BAYFIELD	WI	54814
LARRY J AND CAROL A BADURA	75895 MCKINLEY RD	WASHBURN	WI	54891
LARRY J BLAKELEY TRUSTEE	29945 WANNEBO RD	WASHBURN	WI	54891
LAURANNE AND MERLE BAILEY	1027 GILSON ST	MADISON	WI	53715
LAUREL R SEDGWICK REV TRUST	PO BOX 397	BAYFIELD	WI	54814-0397
LAVERNE J WEBER	1648 LIBERTY AVE	WATERLOO	IA	50702
LAWRENCE A EKHOLM	28805 WEDAL RD	WASHBURN	WI	54891
LAWRENCE J PUBENTZ TRUSTEE	517 EDGEBROOK DR	SHOREWOOD	IL	60404
LELAND P AND MELANIE C CHRISTENSON	70985 ONDOSSAGON RD	ASHLAND	WI	54806
LENORA K AND JOSEPH C NEWAGO SR	81245 MCCULLOCH RD	WASHBURN	WI	54891
LESLIE M AND NANCY M ZELL	557 UPPER 216TH AVE	SOMERSET	WI	54025
LESTER L AND DAMARIS L WESTLING LE ET AL	78280 CHURCH CORNER RD	WASHBURN	WI	54891
LINDA M REED STAIGER	70235 TERWILLIGER RD	ASHLAND	WI	54806
LORETTA L OTIS AND MARGUERITE CRAWFORD ET AL	81200 MCCULLOCH RD	WASHBURN	WI	54891
LORRAINE A YOUNG	322 OAK RD	WASHBURN	WI	54891
LUKAS L KLESSIG	934 RIVER RD NORTH	AMHERST JUNCTION	WI	54407
LYNN L FAULKNER	1101 HANCOCK ST	WAKEFIELD	MI	49968

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Name 1	Address	City	State	Zip
LYNN M CALKINS	73745 ONDOSSAGON RD	WASHBURN	WI	54891
MARCIA A AND ROBERT A PRATT	77045 CHURCH CORNER RD	WASHBURN	WI	54891
MARK A AND PAMELA J SWANSON	138 KLOMPEN CT	NEENAH	WI	54956
MARK HUDSON	30785 ENGOE RD	WASHBURN	WI	54891
MARK TURANY	720 29 1/2 ST	CHETEK	WI	54728
MARK V AND LYNNE M JOHNSON	28305 LUTKIE RD	ASHLAND	WI	54806
MARTIN G AND SUSAN K P VICK	38396 144TH ST	MANSFIELD	SD	54760
MARTIN H AND DEBBIE A HOGLUND	71125 ONDOSSAGON RD	ASHLAND	WI	54806
MATTHEW AND AMANDA METZINGER	29550 CO HWY C	WASHBURN	WI	54891
MATTHEW J OLAUGHLI AND KRISTI J KIEL	29165 MCKINLEY RD	WASHBURN	WI	54891
MATTHEW N AND KRISTEN N EDMUNDS	76050 MCKINLEY RD	WASHBURN	WI	54891
MATTHEW T L COGGER	77225 OLD C ROAD	WASHBURN	WI	54891
MELANIE HAMALAINEN ET AL	5114 18TH ST	KENOSHA	WI	53144
MICHAEL A SANDOR	5509 PERTH DR	EAU CLAIRE	WI	54703
MICHAEL B AND RUTH R BERKE	27850 WANNEBO RD	WASHBURN	WI	54891
MICHAEL BERNARD AND ANDREA FAITH KELNHOFER	78005 BIG RICK RD	WASHBURN	WI	54891
MICHAEL D AND JUDITH V PEYTON	80765 ST HWY 13	WASHBURN	WI	54891
MICHAEL E AND KATHY A HOPKINS ET AL	15104 S COPPERMINE RD	GORDON	WI	54838
MICHAEL J AND REBECCA A WROBLEWSKI	1491 CO HWY C	WASHBURN	WI	54891
MICHAEL TAMI AND KAREN L ZWIEFKA	8209 CARRIAGE LN	SPRING GROVE	IL	60081
MICHELLE TUTOR	77050 CHURCH CORNER RD	WASHBURN	WI	54891
MITCHEL BOHM	668 BOW BELLS RD	ONEIDA	WI	54155
NANCY G NAGLER	750 PAMELA LN	STEAMBOAT SPRINGS	CO	80487
NATHAN MEYER	PO BOX 642	BAYFIELD	WI	54814
NICOLE L AND STEPHEN OLSON	503 E 7TH ST	SUPERIOR	WI	54880
OLAF AND GINA KIRSTEN	29060 CTY HWY C	WASHBURN	WI	54891
PAMELA J AND MICHAEL J LIGHTNER	30240 NEVERS RD	WASHBURN	WI	54891
PAUL C HAUGEN	701 HILLSIDE DR	WASHBURN	WI	54891
PAUL J AND JOYCE GORDON BRATTI	PO BOX 1395	BAYFIELD	WI	54814

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Name 1	Address	City	State	Zip
PAUL M AND EVERGREEN S AMUNDSON	73690 ONDOSSAGON RD	WASHBURN	WI	54891
PAUL M AND SUSAN L AMUNDSON	73700 ONDOSSAGON RD	WASHBURN	WI	54891
PAUL R AND CHRISTINE M BEEKSMA	70485 CHERRYVILLE RD	ASHLAND	WI	54806
PAUL W KACVINSKY JR	73180 ONDOSSAGON RD	WASHBURN	WI	54891
PETER PAPPAS AND NANCY AMREIN CO-TRUSTEES	PO BOX 806	WASHBURN	WI	54891
PETER WAND KATHLEEN GORDON SCHUCHARDT	14777 SQ LAKE TR	STILLWATER	MN	55282
RANCE R AND JULIE A HILTON	E640 1450TH AVE	CLEAR LAKE	WI	54005
RANDALL R RUSCH TRUSTEE	30345 FRIENDLY VALLEY RD	WASHBURN	WI	54891
RANDY C AND XIUMEI HOYER	71015 ONDOSSAGON RD	ASHLAND	WI	54806
RAYMOND G AND SHERRY J CARLSON	78750 KOMBORSKI RD	WASHBURN	WI	54891
RAYMOND L LUTZ ET AL	852 5TH AVE	CLEAR LAKE	WI	54005
RAYMOND W AND ANNE C HOWE	17758 DIXIE HWY	HOMEWOOD	IL	60430
REID M AND ASHLEE M FIORIO	74050 BJORK RD	WASHBURN	WI	54891
RENA LOUISE ARSENEAU	77050 BIG ROCK RD	WASHBURN	WI	54891
RICHARD C YOUNG	33745 STAR RT RD	BAYFIELD	WI	54814
RICHARD G AND JANEL R RYAN	86335 BETZOLD RD	BAYFIELD	WI	54814
RICHARD HUGH J TIMOTHY J AND BRIAN DILLON	703 OAKLAND AVE	ST PAUL	MN	55102
RICHARD M AND CAROL D AVOL TRUSTEES	2 E BAYFIELD ST	WASHBURN	WI	54891
RICHARD R AND SHERRY L LIPKA	75375 BOURGO RD	WASHBURN	WI	54891
RICHARD T AND JEAN M RONNING	25150 TUCKER RD	ROGERS	MN	55374
RICHARD WICHLIDAL ET AL	32438 STAR ROUTE RD	BAYFIELD	WI	54814
ROBBIE L OLSON AND SUSAN K HORTON	84805 HATCHERY RD	BAYFIELD	WI	54814
ROBERT A AND CHERYL DREVLOW	29905 NEVERS RD	WASHBURN	WI	54891
ROBERT AND LEAH EDER	PO BOX 516	WASHBURN	WI	54891
ROBERT AND NICOLA CUTY	32030 FRIENDLY VALLEY RD	WASHBURN	WI	54891
ROBERT C JOHNSON	32160 JOHNSON LEINO RD	WASHBURN	WI	54891
ROBERT C THORESON ESTATE	205 W HARBOR VIEW DR	WASHBURN	WI	54891
ROBERT G AND KAREN K SWANSON	BOX 562	WASHBURN	WI	54891
ROBERT J AND CYNDEE G MARX	28665 COOK RD	WASHBURN	WI	54891
ROBERT R ADAMS	28445 OLD C RD	WASHBURN	WI	54891
ROBERT R AND SHARON L ST GERMAIN	PO BOX 212	WASHBURN	WI	54891

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ROBERT W AND JOEY J GIBB	30680 MATTSON RD	WASHBURN	WI	54891
ROGER L AND DARLENE F NEFF	74555 BJORK RD	WASHBURN	WI	54891
RONALD A AND LINDA C NEMEC	73605 ONDOSSAGON RD	WASHBURN	WI	54891
RONALD GUSKE	PO BOX 361	WASHBURN	WI	54891
RONALD J MICHAEL	76550 MCKINLEY RD	WASHBURN	WI	54891
RONALD J PAGAC	72545 ONDOSSAGON RD	WASHBURN	WI	54891
ROSEMARY M DISANTO SURACE	28049 BELGRAVE RD	PEPPER PIKE	OH	44124
ROY C SETT GAS	75405 CHURCH CORNER RD	WASHBURN	WI	54891
RYAN E AND ASHLEY A LINDSTROM	77720 CHURCH CORNER RD	WASHBURN	WI	54891
RYAN S AND STEPHANIE D BRADY	75355 BOURGO RD	WASHBURN	WI	54891
SCOTT E AND BOBBIE JO E HARPER	20265 CSAH 1	LITCHFIELD	MN	55355
SCOTT P AND PENNY L BUTTERFIELD	5024 CTY RD II	LARSEN	WI	54947
SCOTT ROWLEY	PO BOX 292	GREEN LAKE	WI	54941-0292
SHANNON L ESALA	29240 E ONDOSSAGON RD	ASHLAND	WI	54806
SHARON ROGHOLT	32438 STAR ROUTE RD	BAYFIELD	WI	54814
SHIRLEY J AND DONALD W HAUGEN	29745 SCHOLL RD	WASHBURN	WI	54891
SIGNA AND CHARLES GROVES AND TERRY LYNN SAUVE ET AL	28545 CO HWY C	WASHBURN	WI	54891
SIGURD SHIRLEY A BRIAN E AND BRADLEY EID	28840 NOLANDER RD	WASHBURN	WI	54891
STEPHEN M AND LINDA M SORENSON	75705 ONDOSSAGON RD	WASHBURN	WI	54891
STEVEN J AND KIMBERLY A SPIEL	3558 S 95TH ST	MILWAUKEE	WI	53228
STEVEN J GUSKI	78075 WASHINGTON AVE	WASHBURN	WI	54891
STEVEN L AND SARAH M TETZNER	75110 ONDOSSAGON RD	WASHBURN	WI	54891
STEVEN L KESSENICH	31715 STAR ROUTE RD	BAYFIELD	WI	54814
STEVEN MICHAEL AND KANDACE A YONAN	78105 KOMBORSKI RD	WASHBURN	WI	54891
SUSAN J DUNN	188 BETH CT	BURLINGTON	WI	53105
SUSAN M BUTTERFIELD	PO BOX 577	WASHBURN	WI	54891
SUSAN M ISAKSSON	6804 RIDGEVIEW DR	EDINA	MN	55439-1419
SUZETTE ERICKSON AND ROBERT C JOHNSON	32480 JOHNSON LEINO RD	WASHBURN	WI	54891
TERRY G AND SUSAN L PETERSON	19107 BEAVERDALE RD	NEW LONDON	IA	52645
TERRY L MATIER	77590 BIG ROCK RD	WASHBURN	WI	54891

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Name 1	Address	City	State	Zip
THEODORE J AND PATRICIA A GIERCZIC REV TRUST	217 E 3RD ST	WASHBURN	WI	54891
THOMAS A AND KATHLEEN A WOJCIECHOWSKI	76755 MCKINLEY RD	WASHBURN	WI	54891
THOMAS C AND MATTHEW J JOHNSON	1435 N ELMER ST	GRIFFITH	IN	46319
THOMAS E MORAN	29955 SCHOLL RD	WASHBURN	WI	54891
THOMAS E POCERNICH	29250 E ONDOSSAGON RD	ASHLAND	WI	54806
THOMAS G AND SUSAN LEE	214 15TH AVE E	ASHLAND	WI	54806
THOMAS J AND MARY L KICH	5708 NW ECHO LAKE RD	MERCER	WI	54547
THOMAS J AND PATRICIA L WIATR	77670 KOMBORSKI RD	WASHBURN	WI	54891
THOMAS J STECKLING AND AMY M BILLMAN	75500 MCKINLEY RD	WASHBURN	WI	54891
THOMAS L POTTERTON	71715 ONDOSSAGON RD	ASHLAND	WI	54806
THOMAS O OLSON	PO BOX 884	WASHBURN	WI	54891
THOMAS R AND DEANNA M YOST	80775 MCCULLOCH RD	WASHBURN	WI	54891
THOMAS R AND SALLY K TOEPFER TRUSTEES	77325 RIG ROCK RD	WASHBURN	WI	54891
TIM A AND ANNE C MCCLARAN	24 JAQUITH RD	LANDGROVE	VT	5148
TIMM G AND KERRY L RETZLOFF	77460 CHURCH CORNER RD	WASHBURN	WI	54891
TIMOTHY C SCHWENZFEIER	76805 HOVE LN	WASHBURN	WI	54891
TIMOTHY J HUDAK	70755 ONDOSSAGON RD	ASHLAND	WI	54806
TIMOTHY R AND JODY L COMPTON	1500 CO HWY C	WASHBURN	WI	54891
TIMOTHY S AND LESLIE B BRATLEY	2900 JUNCTION RD	ASHLAND	WI	54806
TODD A ANDERSON	3450 S OCEAN BLVD	PALM BEACH	FL	33480
TODD A GESKE AND KATHLEEN A SKEIE	7626 DALLAS LN N	MAPLE GROVE	MN	55311
TODD L AND PEGGY SWANSON	101 E 3RD ST	WASHBURN	WI	54891
TROY A AND MICHELE M HEGLUND	28320 COZY CORNER RD	ASHLAND	WI	54806
TROY N AND MICHELE A TEGEN	29190 E ONDOSSAGON RD	ASHLAND	WI	54806
ULF B GAFVERT	77100 BIG ROCK RD	WASHBURN	WI	54891
W AND L E WESTLING AND BOBBIE JO E HARPER	78345 CHURCH CORNER RD	WASHBURN	WI	54891
WILLIAM E SCHNEEBERGER AND LORI M EVRARD	31920 MAKI RD	WASHBURN	WI	54891
WILLIAM G AND CHARLOTTE R MIHALEK	78050 CHURCH CORNER RD	WASHBURN	WI	54891
WILLIAM J AND JUDITH M CHINGO	1221 BEASER AVE	ASHLAND	WI	54806
WILLIAM KRCMA	30610 NEVERS RD	WASHBURN	WI	54891
WILLIAM P AND JANE M FLEESON	5040 LONDON RD	DULUTH	MN	55804

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Name 1	Address	City	State	Zip
WILLIAM S ADAMS JR	4786 UP FOREST BEACH RD	PORT WASHINGTON	WI	53074
WILLIAM SCOTT HILTON	5741 COUNTY ROAD B	SIREN	WI	54872
WILLIAM T PAGAC	1830 WHEATON ST	CHIPPEWA FALLS	WI	54729
WILLIAM T ROUTE AND KARIN KOZIE	29580 CO HWY C	WASHBURN	WI	54891
ZACHARY R HILTON	78450 CHURCH CORNER RD	WASHBURN	WI	54891

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Agency List

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Agency Name	Agency Contact	Title	Address 1	City	State	Zip
Bad River Watershed District	Sjana Schanning	President	P.O. Box 875	Ashland	WI	54806
Bayfield County	Jason Bodine	Administrator - Forestry and Parks	PO Box 878	Washburn	WI	54891
Bayfield County	Mark Abeles-Allison	Administrator	PO Box 878	Washburn	WI	54891
Bayfield County Board of Supervisors	Brett T. Rondeau	Supervisory District 13	40360 Cable Sunset Rd.	Cable	WI	54821
Bayfield County Board of Supervisors	George P. Newago	Supervisory District 1	34520 Blueberry Road	Bayfield	WI	54814
Bayfield County Board of Supervisors	Dennis M. Pocernich	Chair, Supervisory District 7	71115 Ondossagon Rd.	Ashland	WI	54806
Bayfield County Board of Supervisors	Fred Strand	Vice-Chair, Supervisory District 8	3420 Strand Rd.	Iron River	WI	54847
Bayfield County Board of Supervisors	Harold A. Maki	Supervisory District 4	3420 Strand Rd.	Washburn	WI	54891
Bayfield County Board of Supervisors	James A. Crandall	Supervisory District 12	10860 N. Loop Road	Drummond	WI	54832
Bayfield County Board of Supervisors	Jeffery Silbert	Supervisory District 6	502 E. 4th St.	Washburn	WI	54891
Bayfield County Board of Supervisors	Jeremy Oswald	Supervisory District 5	401 W. 5th St.	Washburn	WI	54891
Bayfield County Board of Supervisors	Larry Fickbohm	Supervisory District 3	79730 Evergreen Rd.	Port Wing	WI	54865
Bayfield County Board of Supervisors	Marty Milanowski	Supervisory District 10	66040 US Hwy 63	Mason	WI	54856
Bayfield County Board of Supervisors	David A. Zepczyk	Supervisory District 11	30015 Co Hwy E	Mason	WI	54856
Bayfield County Board of Supervisors	Thomas Snilsberg	Supervisory District 9	67275 Shady Oak Drive	Iron River	WI	54847
Bayfield County Board of Supervisors	Thomas J. Gordon	Supervisory District 2	27050 Star Route	Bayfield	WI	54814

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Agency Name	Agency Contact	Title	Address 1	City	State	Zip
Bayfield County Planning and Zoning	Rob Schierman	Director	117 E. Fifth St.	Washburn	WI	54891
City of Ashland	April Kroner	Director of Planning and Development	601 Main St. W.	Ashland	WI	54806
City of Ashland	Deb Lewis	Mayor	601 Main St. W.	Ashland	WI	54806
City of Ashland	Denise Oliphant	City Clerk	601 Main St. W.	Ashland	WI	54806
City of Ashland	Vacant	City Administrator				
City of Ashland	Raymond Hyde	Public Works Director	2020 6th St. E.	Ashland	WI	54806
City of Ashland	Holly George	City Councilors - Ward 1	2812 Fellman Drive	Ashland	WI	54806
City of Ashland	Richard Ketring	City Councilors - Ward 2	504 10th Avenue West	Ashland	WI	54807
City of Ashland	Sarah Jackson	City Councilors - Ward 3	701 12th Avenue West	Ashland	WI	54808
City of Ashland	Kate Ullman	City Councilors - Ward 4	1222 9th Avenue West	Ashland	WI	54809
City of Ashland	Ana Tochtermann	City Councilors - Ward 5	818 Vaughn Avenue	Ashland	WI	54810
City of Ashland	David Mettillie	City Councilors - Ward 6	608 Chapple Avenue	Ashland	WI	54811
City of Ashland	Kevin Haas	City Councilors - Ward 7	801 Ellis Avenue	Ashland	WI	54812
City of Ashland	Charlie Ortman	City Councilors - Ward 8	708 Ellis Avenue	Ashland	WI	54813
City of Ashland	Elizabeth Franek	City Councilors - Ward 9	407 Willis Avenue	Ashland	WI	54814
City of Ashland	Dick Pufall	City Councilors - Ward 10	1203 Main Street East	Ashland	WI	54815
City of Ashland	Jackie Moore	City Councilors - Ward 11	307 14th Ave. East	Ashland	WI	54816
City of Bayfield Administration	Gordon T. Ringberg	Mayor	PO Box 1170	Bayfield	WI	54814
City of Bayfield Clerk	Billie Hoopman	City Clerk	PO Box 1170	Bayfield	WI	54814
City of Bayfield Common Council	Sheryl Burkel	Common Council - District 2	PO Box 1284	Bayfield	WI	54814
City of Bayfield Common Council	James Bryan	Common Council - District 1	PO Box 7	Bayfield	WI	54814
City of Bayfield Common Council	Jon C. Nelson	Common Council - District 3	PO Box 1174	Bayfield	WI	54814
City of Bayfield Common Council	Sharon Johnson	Common Council - District 4	PO Box 406	Bayfield	WI	54814

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Agency Name	Agency Contact	Title	Address 1	City	State	Zip
City of Bayfield Public Works	Thomas Kovachevich	Public Works Director	125 S First St.	Bayfield	WI	54814
City of Bayfield Utility Clerk and Zoning	Dionne Johnston	Utility Clerk/Deputy Zoning Administrator	125 S First St.	Bayfield	WI	54814
City of Washburn Mayor	Richard Avol	Mayor	119 Washington Ave.	Washburn	WI	54891
City of Washburn Administration/Clerk	Scott J. Kluver	City Administrator/Clerk	119 Washington Ave.	Washburn	WI	54891
City of Washburn Clerk	Kay Bratley	Deputy Clerk/Treasurer	119 Washington Ave.	Washburn	WI	54891
City of Washburn Council	Jennifer Maziasz	District 2 Ward 2/3 Council Member	26 E 3rd Street	Washburn	WI	54891
City of Washburn Council	Jeremy Oswald	District 3 Ward 4 Council Member	PO Box 551	Washburn	WI	54891
City of Washburn Council	John Gary	District 1 Ward 1 Council Member	506 East 4th St	Washburn	WI	54891
City of Washburn Council	Mary McGrath	District 1 Ward 1 Council President	111 South 3rd Ave East	Washburn	WI	54891
City of Washburn Council	Linda Barnes	District 2 Ward 2/3 Council Member	5 West 3rd Street	Washburn	WI	54891
City of Washburn Council	Aaron Austin	District 3 Ward 4 Council Member	309 9th Ave. West	Washburn	WI	54891
City of Washburn Council	Karen Spears Novachek	Councilor At Large	610 East 4th Street	Washburn	WI	54891
City of Washburn Public Works	Gayla Salmi	Director	PO Box 638	Washburn	WI	54891
Public Service Commission of Wisconsin	Adam Ingwell	Environmental Affairs Coordinator - Supervisor	PO Box 7854	Madison	WI	53705
Public Service Commission of Wisconsin	Jim Lepinski	PSC Docket Coordinator	610 North Whitney Way, 2nd Floor	Madison	WI	53705
Red Cliff Band of Lake Superior Chippewa	Richard Peterson	Chairman	88455 Pike Road	Bayfield	WI	54814

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Agency Name	Agency Contact	Title	Address 1	City	State	Zip
Red Cliff Band of Lake Superior Chippewa	Laura Gordon	Executive Secretary	88455 Pike Road	Bayfield	WI	54814
Red Cliff Band of Lake Superior Chippewa	Jeff Benton	Transportation Planner	88455 Pike Road	Bayfield	WI	54814
Red Cliff Band of Lake Superior Chippewa	Johanna Wilson	Administrative Assistant	88455 Pike Road	Bayfield	WI	54814
Red Cliff Band of Lake Superior Chippewa	Marvin Dafoe	Tribal Historic Preservation Officer	88455 Pike Road	Bayfield	WI	54814
Red Cliff Band of Lake Superior Chippewa	Chad Abel		88455 Pike Road	Bayfield	WI	54815
Red Cliff Band of Lake Superior Chippewa	Betty Kerr	Tribal Planner	88455 Pike Road	Bayfield	WI	54815
State Historic Preservation Office	Chip Brown	State Historic Preservation Officer	816 State St.	Madison	WI	53706
Town of Barksdale Chair	Dennis M. Pocernich	Chair	71115 Ondossagon Rd.	Ashland	WI	54806
Town of Barksdale Clerk	Lynn M. Divine	Clerk	28090 Cherryville Rd	Ashland	WI	54806
Town of Barksdale Supervisor	Chris Breting	Supervisor	29890 Nolander Rd	Washburn	WI	54891
Town of Barksdale Supervisor	John Nyara	Supervisor	73430 Ondossagon Rd	Washburn	WI	54891
Town of Barksdale Treasurer	Susan M. Sanders	Treasurer	71730 Range Rd	Ashland	WI	54806
Town of Bayview	Charly Ray	Town Chairman	32800 Burlager Rd	Washburn	WI	54891
Town of Bayview	Don Jenicek	Town Supervisor	32800 Burlager Rd	Washburn	WI	54891
Town of Bayview	Kelly Warren	Town Treaurer	32800 Burlager Rd	Washburn	WI	54891
Town of Bayview	Larry Nelson	Town Supervisor	32800 Burlager Rd	Washburn	WI	54891
Town of Bayview	Wanda Hyde	Town Clerk	32800 Burlager Rd	Washburn	WI	54891
Town of Bell (Cornucopia)	Janice Olson	Supervisor	21955 Old Hwy 13	Cornucopia	WI	54827
Town of Bell (Cornucopia)	Lynda Nedden-Durst	Treasurer	21475 State Hwy 13	Cornucopia	WI	54827
Town of Bell (Cornucopia)	MaryBeth Tillmans	Clerk	P.O. Box 116	Cornucopia	WI	54827
Town of Bell (Cornucopia)	Matt Lazorik	Chairman	22205 St. Hwy 13	Cornucopia	WI	54827

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Agency Name	Agency Contact	Title	Address 1	City	State	Zip
Town of Bell (Cornucopia)	Mike O'Bryon	Supervisor	P.O. Box 305	Cornucopia	WI	54827
Town of Bell (Cornucopia)	Vicki Lewis-Hay	Supervisor	22560 Elm	Cornucopia	WI	54827
Town of Bell (Cornucopia)	Yvette Fleming	Supervisor	P.O. Box 225	Cornucopia	WI	54827
Town of Clover (Herbster)	Barbara Rebak	Supervisor	14515 St. Hwy 13	Herbster	WI	54844
Town of Clover (Herbster)	Bev Steele	Chairperson	88775 Bark Point Rd.	Herbster	WI	54844
Town of Clover (Herbster)	Cynthia Hepner	Treasurer	14515 Cranberry River Rd.	Herbster	WI	54844
Town of Clover (Herbster)	Jack Smith	Supervisor	86845 Lenawee Rd.	Herbster	WI	54844
Town of Clover (Herbster)	Merv Shaffer	Supervisor	14845 Willow St.	Herbster	WI	54844
Town of Clover (Herbster)	Patti Stemwedel	Supervisor	16205 US Hwy 13	Herbster	WI	54844
Town of Clover (Herbster)	Tracy Gillespey	Clerk	P.O. Box 94	Herbster	WI	54844
Town of Eileen Chairman	Marty Milanowski	Chair	66040 US Hwy 2	Mason	WI	54806
Town of Eileen Clerk	Crystal Mattson	Clerk	28045 Co Hwy G	Ashland	WI	54806
Town of Iron River	Helen Hyde	Clerk/Treasurer	P.O. Box 485	Iron River	WI	54847
Town of Iron River	John Rautio	Supervisor	P.O. Box 144	Iron River	WI	54847
Town of Iron River	Lori Anderson	Supervisor	68515 Lea St.	Iron River	WI	54847
Town of Iron River	Maureen Johnson	Deputy Clerk	66284 Hart Lake Rd.	Iron River	WI	54847
Town of Iron River	Michelle Davis	Supervisor	68240 S. Bohn St.	Iron River	WI	54847
Town of Iron River	Steve Probst	Town Chairman	7965 Ridge Rd.	Iron River	WI	54847
Town of Iron River	Wayne "Rusty" Williams	Supervisor	P.O. Box 425	Iron River	WI	54847
Town of Port Wing	Dwight Johnson	Chairman	8435 St. Hwy. 13	Port Wing	WI	54865
Town of Port Wing	Eleanora Tribys	Treasurer	P.O. Box 43	Port Wing	WI	54865
Town of Port Wing	Gary Williams	Supervisor	82525 Gustafson Rd.	Port Wing	WI	54865
Town of Port Wing	Marjorie Ogren	Clerk	P.O. Box 28	Port Wing	WI	54865-0028
Town of Port Wing	Russell Bailey	Supervisor	P.O. Box 126	Port Wing	WI	54865
United States Army Corps of Engineers	Bill Sande	Project Manager	15954 River's Edge Dr. Suite 240	Hayward	WI	54843
United States Fish and Wildlife Service	Pete Fasbender	Field Office Supervisor	4101 American Boulevard East	Bloomington	MN	55425

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Agency Name	Agency Contact	Title	Address 1	City	State	Zip
United States Fish and Wildlife Service	Bridget Olson	Manager, St. Croix Wetland Mgmt Dist	1764 95th St	New Richmond	WI	54017
United States Fish and Wildlife Service		Whittlesey Creek NWR	NGLVC 29270 Co Hwy G	Ashland	WI	54806
United States Forest Service	Jonathan McNeill	Washburn Ranger Station - Real Estate	113 Bayfield St. East	Washburn	WI	54891
Wisconsin Coastal Management Program	Kathleen Angel	Program and Planning Analyst	101 East Wilson Street, 9th Floor	Madison	WI	53708
Wisconsin Department of Natural Resources	Ben Callan	Section Chief	101 S. Webster St.	Madison	WI	53703
Wisconsin Department of Natural Resources	David Lindsley	Property Manager, South Shore Lake Superior FWA	2501 Golf Course Rd	Ashland	WI	54806
Wisconsin Department of Natural Resources	Lindsay Tekler	Waterway and Wetland Permits	101 S. Webster St.	Madison	WI	53703
Wisconsin Department of Natural Resources	Steven Bade	Real Estate Specialist	2501 Golf Course Rd	Ashland	WI	54806
Wisconsin Department of Natural Resources	Heidi Nelson	Federal Aid Coordinator	101 S Webster St.	Madison	WI	53707
Wisconsin Department of Natural Resources (Endangered Resources)	Angela White	Conservation Biologist	101 S. Webster St.	Madison	WI	53703
Wisconsin Department of Natural Resources (Storm Water Pollution Prevention Plan/Construction)	Kimberly Gonzalez	Water Resource Engineer	101 S. Webster St.	Madison	WI	53703
Wisconsin Department of Natural Resources (Wetlands and Waterways)	Steve LaValley	Water Regulations and Zoning Specialist	1701 N 4th St.	Superior	WI	54880
Wisconsin Department of Transportation	Chris Michels	Land Division Reviewer (Northwest Region)	718 W. Clairemont Ave.	Eau Claire	WI	54701

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Agency Name	Agency Contact	Title	Address 1	City	State	Zip
Wisconsin Department of Transportation	Daniel Anderson	Land Division Reviewer (Northwest Region)	W7102 Green Valley Rd.	Spooner	WI	54801
Wisconsin Department of Transportation	Sue Heller	Utility Coordinator	1701 N 4th St. Ste. 3	Superior	WI	54880

EXHIBIT 3
Library List

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Bayfield Second Circuit Transmission Line Project
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Exhibit 3 - Library List

Name	Address 1	Address 2	City	State	Zip
Bayfield Carnegie Library	37 North Broad Street		Bayfield	WI	54814
Washburn Public Library	307 Washington Avenue	PO Box 248	Washburn	WI	54891
Northern Waters Library Service	3200 Lakeshore Drive E		Ashland	WI	54806

APPENDIX H

WDNR ENDANGERED RESOURCES REVIEW

NON-PUBLIC DATA

APPENDIX I

EXISTING CORRIDOR CHALLENGES

Existing Transmission Line Corridor Construction Challenges

Different configurations and construction methods were evaluated for construction of the East Route, which follows the existing transmission line corridor between the new Fish Creek substation and the new Pikes Creek Substation. The primary challenge with this corridor is that the existing line is the only source of power to the east side of the Bayfield Peninsula and must be kept in service (energized) during construction of the Project. The existing line also has 11.5 miles of line that are not located adjacent to roads, often in hilly terrain with multiple stream and river crossings, which makes access to and from the line more difficult.

Evaluation of potential ways to build the Second Circuit Project within or along the existing corridor included a variety of construction/configuration alternatives including:

- Construct a new single-circuit line parallel to the existing line:
 - New line on new poles which would share road right-of-way (ROW) and/or transmission line ROW when possible
 - Looked at placement on either the east or west sides of the existing line
- Construct a new line double-circuited with the existing line:
 - New double-circuit line on the same centerline as the existing line OR
 - New double-circuit line offset from the existing line by 35-50 feet
- Construct the new line using a combination (or hybrid) of both single-circuit parallel to and double-circuit with the existing line

A parallel line would allow construction crews to reduce contact with the existing energized line, which reduces the risk of an accidental outage during construction. It also places the lines on separate sets of poles, which provides better ongoing reliability (i.e., if one pole goes down it only takes out one line). However a parallel line would require expansion of the existing ROW in order to accommodate the new line, and in many cases the line would need to be placed on the opposite side of the road from the existing transmission line, requiring all new ROW from new owners.

A new line on double-circuit poles with an existing transmission line limits the total amount of ROW needed for the two lines, but requires that crews work with the existing line which will remain energized. This creates safety risk to crews working with and adjacent to the energized line. There is also a reliability risk during construction if there is any failure of poles, conductor or insulators while crews are working with the line. It also places both lines on the same set of poles after construction, increasing the risk that damage to a single pole could take out both lines. Double-circuiting with an existing energized line typically involves tipping of the poles on existing line to create room for the new poles to be placed on the same centerline. More detail about the challenges with tipping poles is included in Method 2 below. Because of the concerns with tipping poles an option to construct a new double-circuit line offset from the existing line was also considered. This option is described in more detail in Method 1 below.

Appendix I. Existing Corridor Construction Challenges

Using a combination, or hybrid, of single and double-circuit was considered as a possible alternative. Limiting impacts to landowners along roads by double-circuiting in those locations, and potentially limiting safety and reliability concerns in more remote locations by paralleling the existing line and allowing crews to limit contact with the existing line.

Field reviews were conducted with construction, engineering and routing staff and accessed nearly the entire length of the existing alignment to better understand site conditions. There are a number of locations where the terrain within the transmission corridor does not allow travel along the ROW, necessitating off ROW access routes, which were also reviewed in the field. Remote access points, rugged terrain and some very long spans across streams or rivers led the team to determine that it was not viable to attempt to construct a second circuit within the same corridor as the existing line if the existing 34.5 kV were to remain energized.

A key focus of these visits was to evaluate how the new line could be constructed safely and reliably. In addition the team focused on determining anticipated construction impacts for any methods proposed. Safety constraints include requirements for workers and equipment to maintain safe distances (minimum approach distances) from energized wires, and to install personal protective coverup materials on energized conductors in the areas where they are working necessary to keep crews safe during construction. This also includes creating level pads in locations where equipment needs to be set up and access routes to get safely to, from and along the ROW. Reliability concerns primarily relate to how to ensure that the existing poles, insulators and conductor do not fail while construction is underway.

Using a Temporary Bypass Transmission Line

Following some of the early site reviews the Project team identified an option to construct in the existing corridor by utilizing a temporary transmission line, also called a temporary bypass line. The temporary line could be installed and energized first, allowing the existing line to be taken out of service during construction within the corridor. The team determined that the temporary bypass line option was the safest and most reliable, as well as most cost-effective way to construct within the existing corridor, the East Route. While there are costs associated with construction of the temporary line, the use of a temporary bypass reduces many costly safety and/or reliability practices that would be necessary in order to work while keeping the existing line energized. The temporary bypass also allows the line to be constructed on the same centerline as the existing line, eliminating the need to acquire additional ROW for the length of the project.

Even with the use of the temporary bypass line there are challenges associated with construction of the East Route (double-circuit in existing corridor) including:

- Construction of approximately 7.2 miles of off-ROW access roads will be necessary due to:

Appendix I. Existing Corridor Construction Challenges

- Remote sections of existing corridor not near roads
 - Difficult terrain within the ROW which prevents travel along the ROW
- Increased time and expense associated with more long in-and-out access for construction vehicles and equipment
 - Particularly difficult for bringing in concrete trucks for drilled piers (needed for long span crossings in some remote locations)
- 2 long spans will require additional ROW width requiring additional tree clearing
- Construction pads will need to be built/graded into areas with steep slopes for equipment setup

Other Construction Methods Evaluated for the East Route

Prior to development of the temporary bypass line construction method two other methods were considered for building a new double-circuit line in the existing corridor. Both would require keeping the existing 34.5 kV transmission line in service throughout the construction process.

Method 1 would involve construction of a new double-circuit line next to, but offset by 35 to 50 feet from, the existing transmission line. Method 2 would involve construction of a new double-circuit line on the same centerline as the existing line, and would require that the energized line be tipped to set new structures and string conductor within the same alignment. In both of these cases, once the new line was completely constructed, the existing line would be de-energized and removed. In addition to the challenges identified above for construction of a double-circuit line in the existing corridor, there were several significant challenges associated with both of these construction methods (listed below). Not all of the types of challenges described below are present in all locations on the route. These challenges are also not insurmountable; however for both of the methods, the variety, number and locations of challenges along the route, taken as a whole, made each of those methods less viable than the temporary bypass line method of construction.

Method 1: Construct new double-circuit offset from existing line (requires approximately 25 feet or more of ROW expansion):

There are parts of the existing corridor where there is adequate room to construct a new line offset from, and parallel to, the existing line. This construction method was considered because it would allow the new double circuit line to be constructed within the existing transmission corridor while leaving the existing line relatively untouched until the new line was completed. Once construction was completed on the new double-circuit line the old line could be de-energized and removed, leaving the new line in place along approximately the same alignment as the original line.

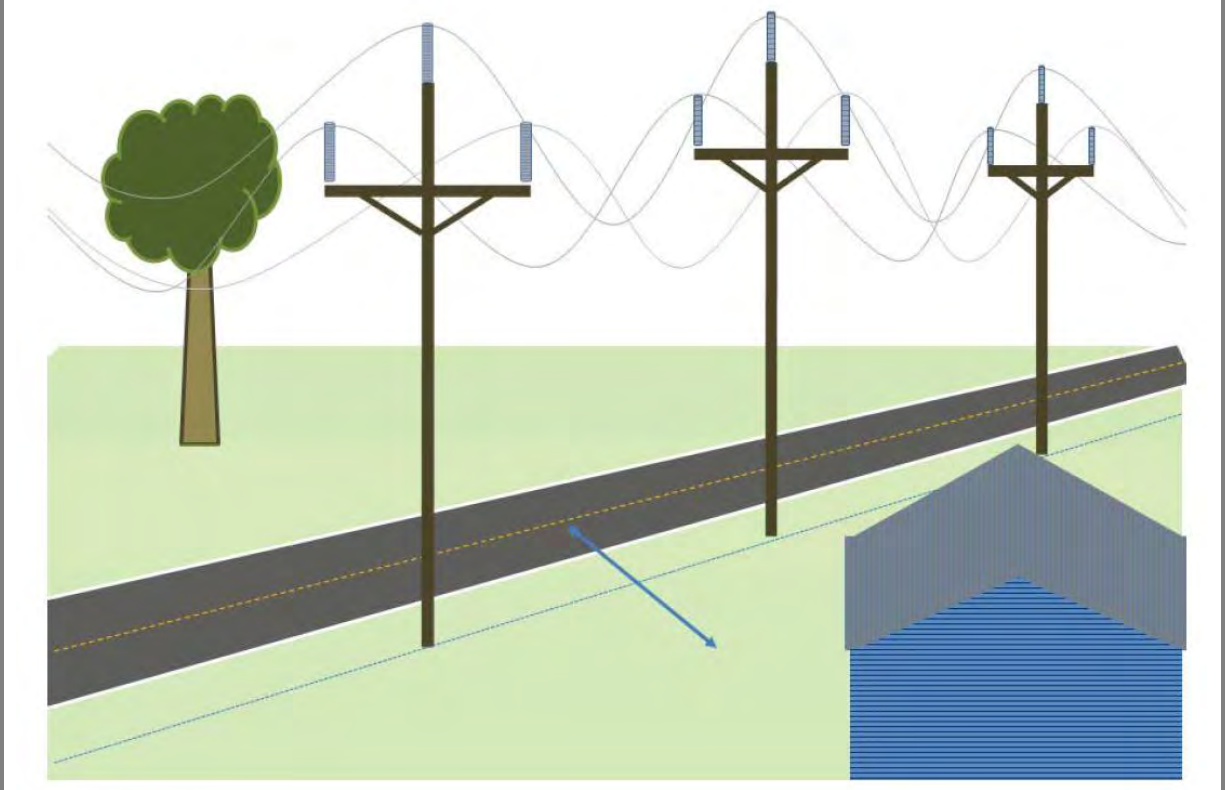
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Where the transmission line follows roads (approximately 7.5 miles of the route) the offset would typically be to the opposite side of (away from) the road because in most cases there is not adequate room to place the new line between the road and the existing line. Along the 11.5 miles where the line does not follow roads additional tree clearing would be necessary to accommodate the offset line. This is because the existing line is located in the middle of the easement leaving approximately 50 feet of cleared ROW on either side of the existing line. A new offset double-circuit line 35 to 50 to one side of this centerline would then require 25 feet of additional tree clearing for the new ROW. Some additional constraints associated with this method are described below.

Constraints Along roads:

There are some locations where there are houses within close proximity to the line (one within 25 feet, several more within 26 to 150 feet from the line) and a new parallel double-circuit line would be 35 to 50 feet closer to the home (figures 1 and 2). Expansion of ROW and placement of the new line closer to these homes was not considered to be an acceptable option in some of these cases and tipping of poles to stay on the same centerline would have been necessary (see challenges with Method 2 described below).

Figure 1. Existing ROW in some locations is constrained between the road and existing homes. Offset line would be even closer to home.



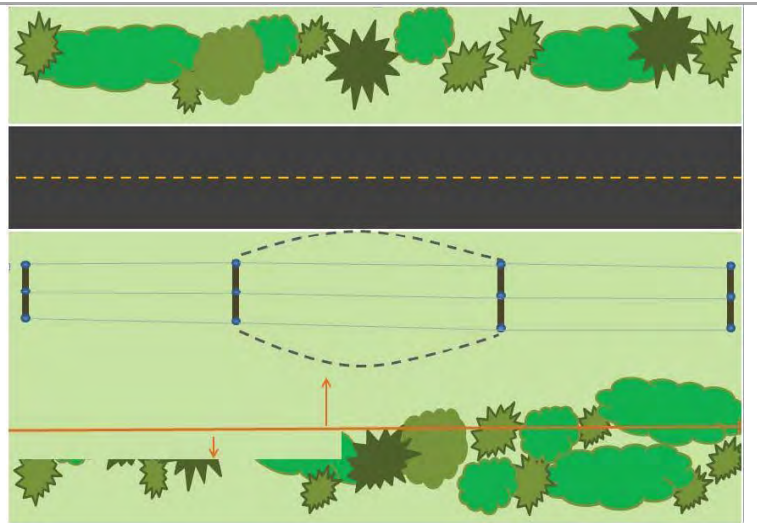
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Figure 2. Pictures of existing line located in close proximity to homes.



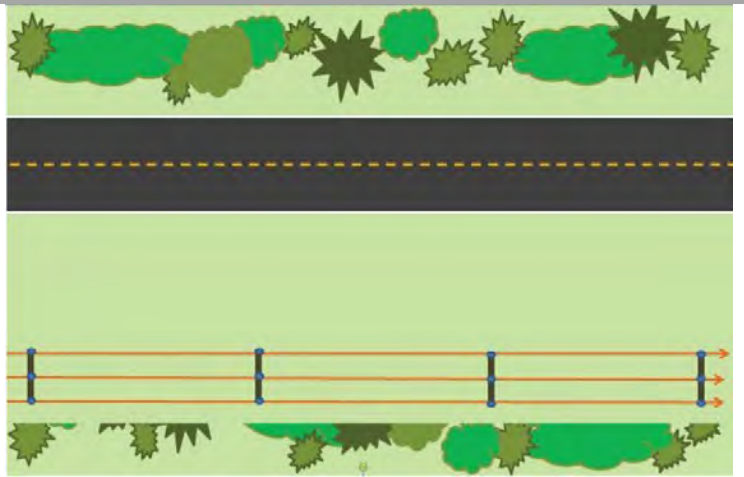
Where the offset line is placed further from the road than the existing line the end result (once the old line is removed) would be a double-circuit line set well back from the road as shown in figures 3a and 3b.

Figure 3a. Construction of new offset line: Plan view of the existing line corridor during construction of a new offset double-circuit line along a road. The new line must be offset at a safe distance from the existing line, which will remain energized during construction. This will often require additional tree clearing to accommodate the new line. The orange line represents the new centerline.



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Figure 3b. Post construction: Plan view after construction is complete and the existing (old) line has been removed. The resulting permanent double-circuit line is now set further back from the road.



In remote areas:

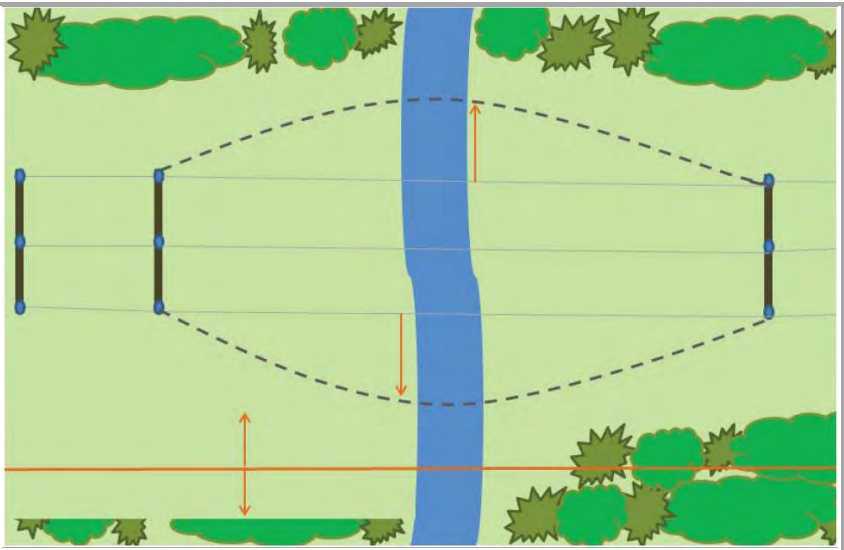
Three-pole and H-frame structures at major valley crossings would be required, and need greater ROW expansion at the poles because the structures are wider, and at mid-span because the longer spans (1300'-1800') require a wider ROW and a greater offset distance (figures 4 and 5).

Figure 4. Pictures of long spans on existing line with 3-pole structures.



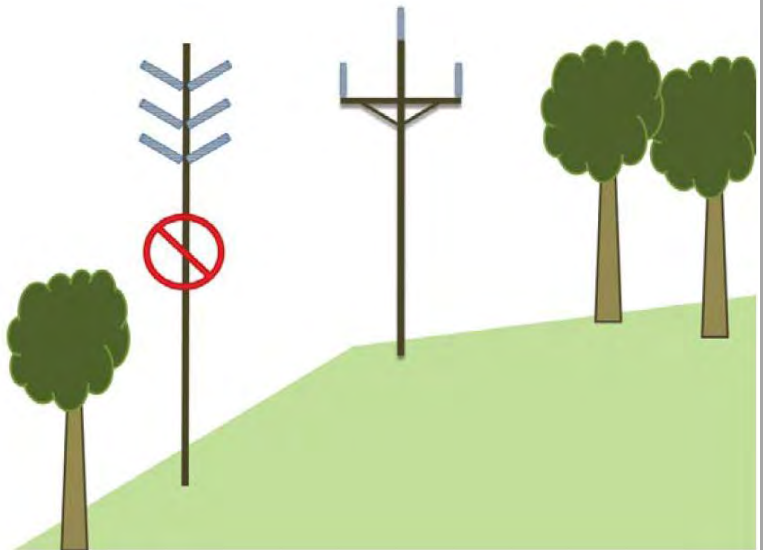
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Figure 5. Long Spans Require wider ROW: Plan view showing a longer span where the existing line crosses a stream or river. Long spans require wider right-of-way. An offset line would need to be constructed a greater distance away for safety and reliability while the existing line is still in place. The orange line represents the centerline for the new offset line.



Many pole locations are on ridges or slopes where an offset pole would have to be placed in a much less desirable location. Some of these ridges do not have adequate room for crews to set up for construction safely and could require grading large areas to provide working clearance from energized line. In these steeply sloped locations the existing poles are already placed in the most optimal location on the ridge. Attempting to build a new line adjacent to the existing line would require that the poles be offset into some poor locations (figures 6 and 7).

Figure 6. Offset in less than optimal location: In the existing line corridor there are many locations where the existing pole is located in the optimal location on a ridge or slope. To construct a new offset double-circuit line it would be necessary to place poles at locations further down, or at the bottom of slopes. This results in more challenging construction setups and the need for some extremely tall poles in order to meet necessary ground clearances mid-span.



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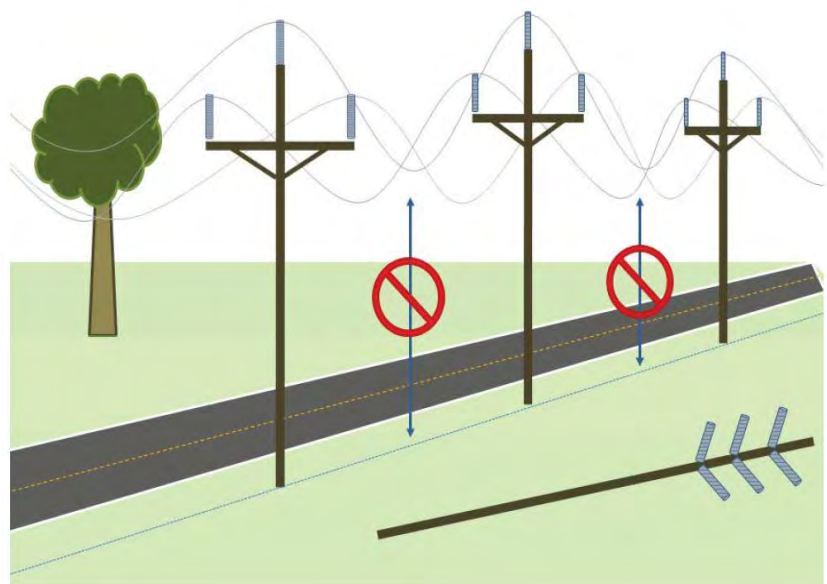
Figure 7. Photo of existing ROW where there is not a good location for an offset line.



Both along roads and in remote areas:

In some locations the existing line does not have adequate clearance to allow crews to work under the line; the offset is typically away from the road so crews would need to cross under the line to get to the new double-circuit offset location (figure 8).

Figure 8. Inadequate clearance under existing line: To construct the new line on the side away from the road line crews would need to haul poles in under the existing energized line. The clearance between the ground and existing conductor is not adequate in all areas to allow crews to safely work beneath, or transport materials and equipment, the existing line.



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Because the best location for a new double-circuit line is not always on the same side of the existing line, some locations would require crossing up and over the existing line in the same corridor. This would require much taller structures on either side of the crossing and more challenging safety setups for construction and wire stringing. After the old line is removed the result would be a location with one span with unusually tall poles remaining in place (figures 9a and 9b).

Figure 9a. Tall span to cross existing line during construction.

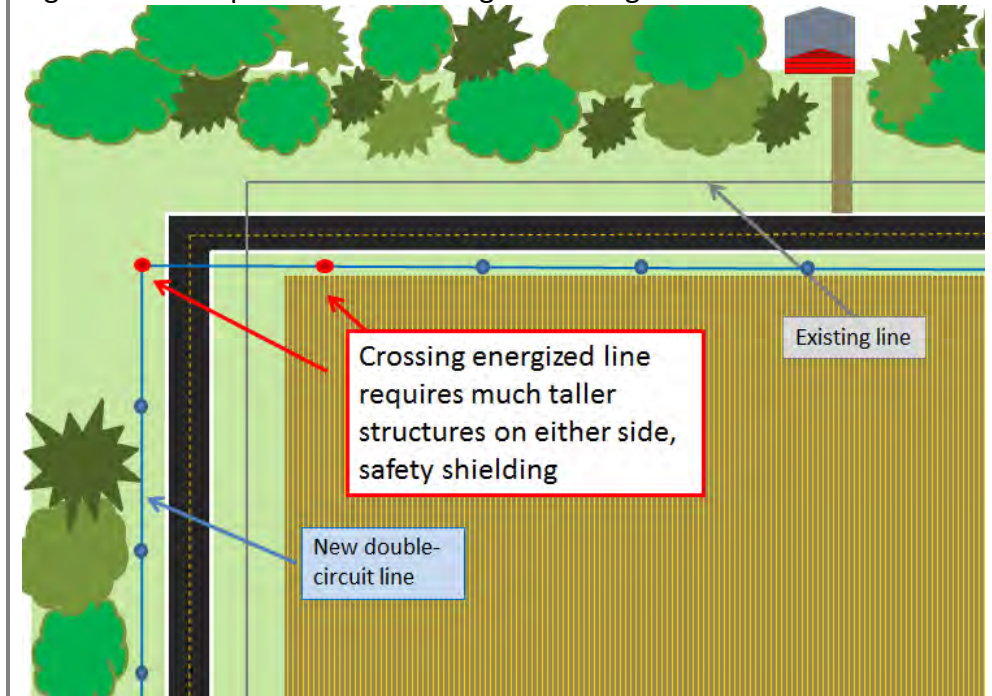
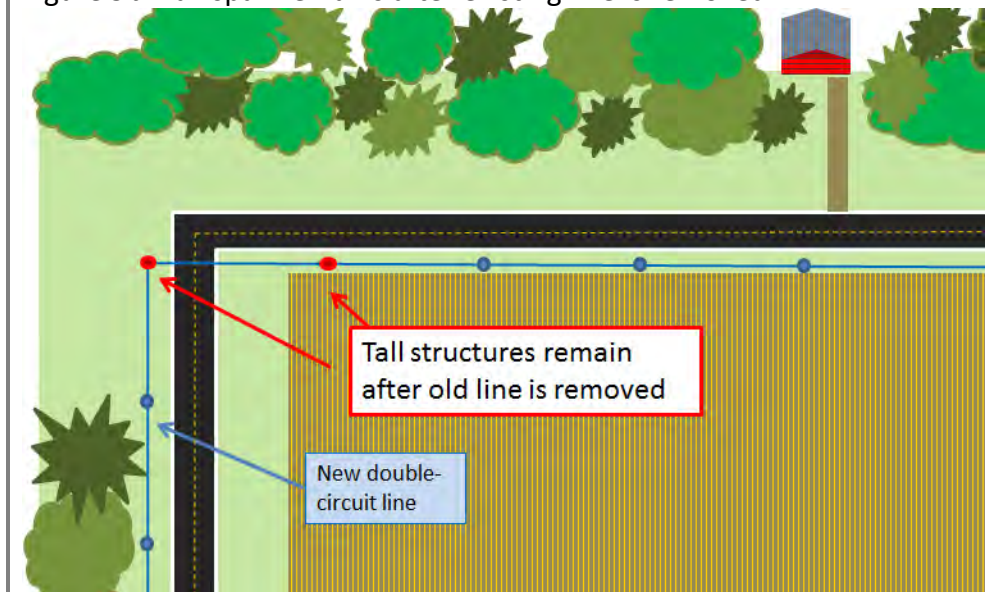


Figure 9b. Tall span remains after existing line is removed.



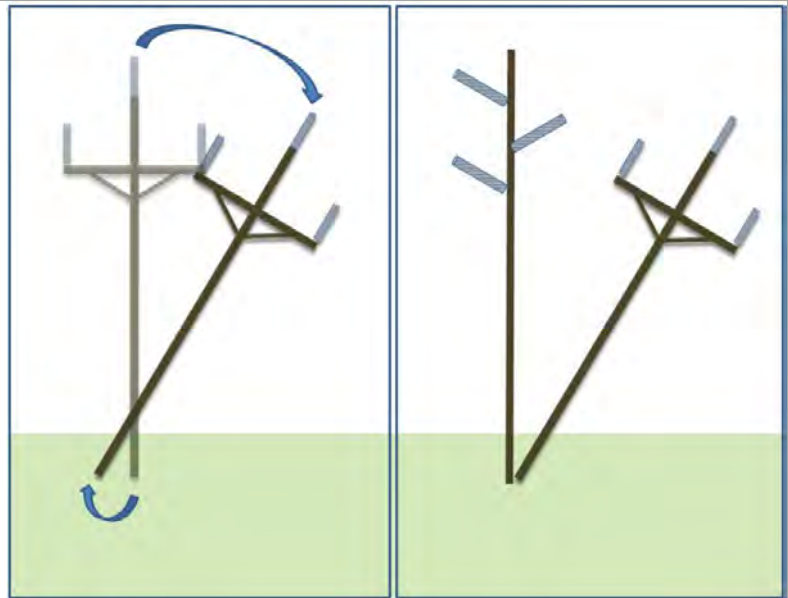
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Method 2: Construct new double-circuit on same centerline as existing by tip poles (mostly stays within existing ROW):

Typically when a new line needs to be built on the same alignment as an existing line, and that line needs to be kept in service (or brought back on line very quickly), crews will tip the line during construction. Tipping the poles moves the conductor away from the centerline, allowing a new pole to then be placed vertically on the same centerline without contacting the tipped, energized line (figure 10). With this construction method a number of poles would all be tipped in line with each other and in the same direction. Once the new poles were set for that section of the line the existing conductor would be transferred over to the new structures and the old structures removed. Crews would then move down the line to another section and complete the process.

Figure 10. Line Tipping

The first step is to tip a series of poles in one direction, moving the conductor away from the existing centerline. Once that section of line is tipped the new poles can be placed on the original centerline. When the new poles are in place and insulators are attached conductor is transferred from the old insulators to the new poles/insulators. Once conductor is transferred, the old poles can be removed. Crews will tip the next section of line and go through the same process.



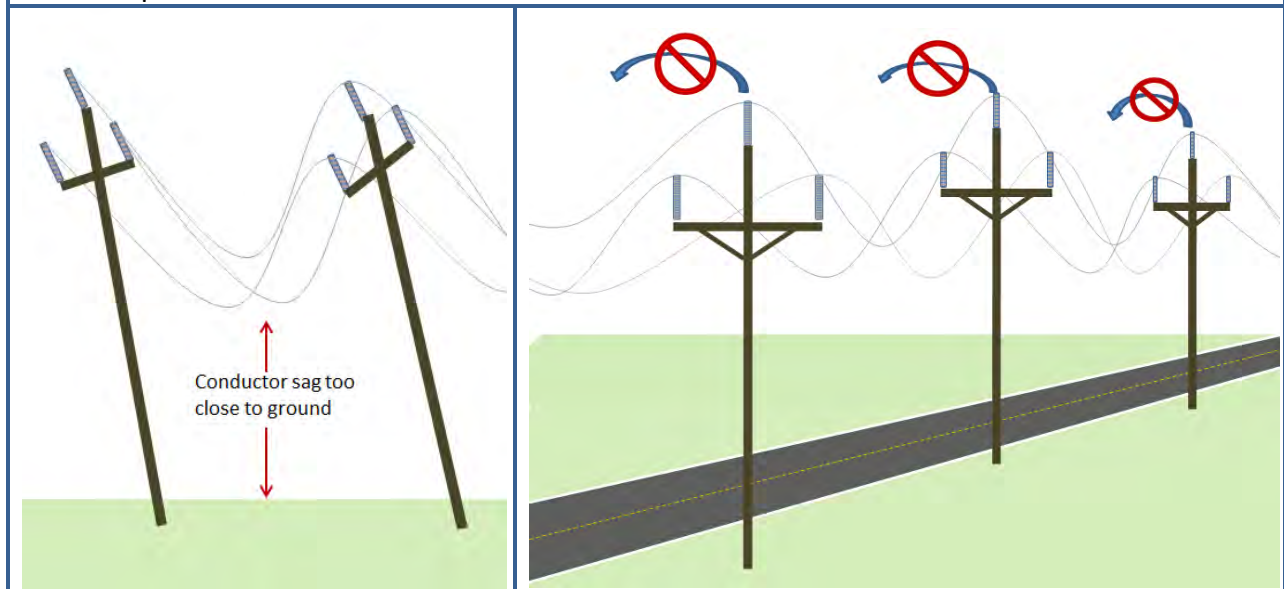
Construction and engineering considered the possibility of tipping the poles on the existing line for the project, but identified a number of characteristics of the existing line which led to concerns about using that method. Some of these concerns are described below.

Clearance issues (distance from the ground to the conductor):

The existing line is shorter than typical transmission lines on Xcel Energy's system. Because of the height of existing poles, tipping the line would result in more locations where ground clearances at mid-span were unsafe for construction vehicles to work under (see also ground clearances for offset line above). The line also cannot be tipped toward road because mid-span clearances also would be unacceptable for public roads (figures 11a and 11b).

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Figures 11a and b Line Clearance Concerns: Tipping brings conductor too close to the ground, Cannot tip line over roads.



Line condition issues:

Some risks associated with tipping the line are due to the condition of the existing line. For example:

Insulators: Many of the hand ties holding conductor to insulators are worn or stretched. The integrity to hold conductor if the line is tipped cannot be assured, and new clamp tops would need to be installed to every insulator prior to tipping.



Figure 12. Insulators

The existing vertical post insulators have a single hand tie wire on top holding the conductor onto the insulator. Over the lifespan of the line lightning strikes and storms have damaged many of the ties. If the line were tipped, these ties would need to be able to support the weight of the conductor rather than just holding it in place, with most of the weight resting on the insulator and crossarm, as it is now. In order to maintain reliable service it would be necessary to replace all of the ties prior to tipping poles.

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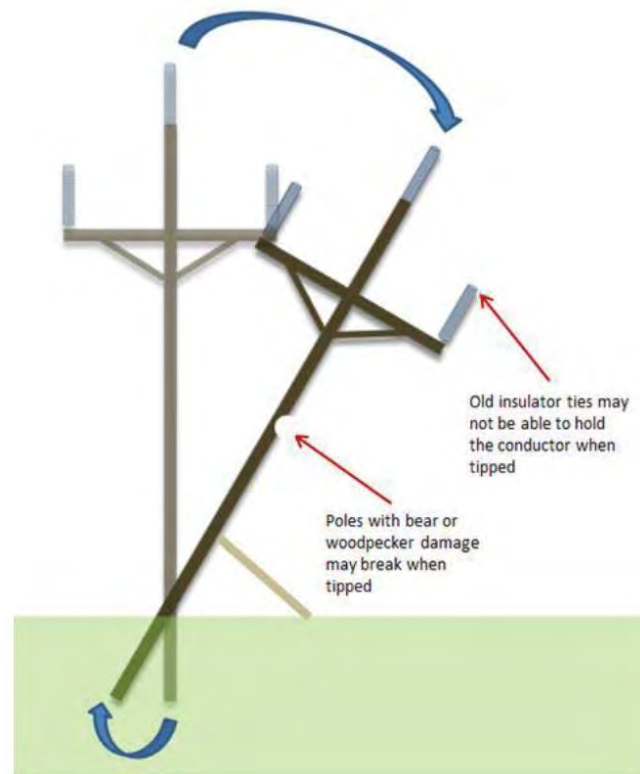
Poles: Some wood poles are not in suitable condition to tip and would need to be reinforced to ensure that they didn't break when stressed at an angle (figures 13 and 14).

Figure 13. Poles damaged by bears and general wear and tear.



Figure 14. Tipping Damaged Poles

Tipping a line puts stress on different parts of the pole and equipment. The weight of the existing conductor can cause insulators and poles to fail when a line is tipped because the force is no longer going straight down the insulators and pole. Weak spots in a pole may not present a problem when the weight of the line is pushing straight down, but when tipped the force is pulled



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When tipping a section of line a number of poles in sequence all need to be tipped in the same direction. Adjacent poles cannot be tipped in opposite directions because of the strain that would place on the conductor and insulators. In some locations on the ROW there are adjacent poles located on slopes facing in different directions.

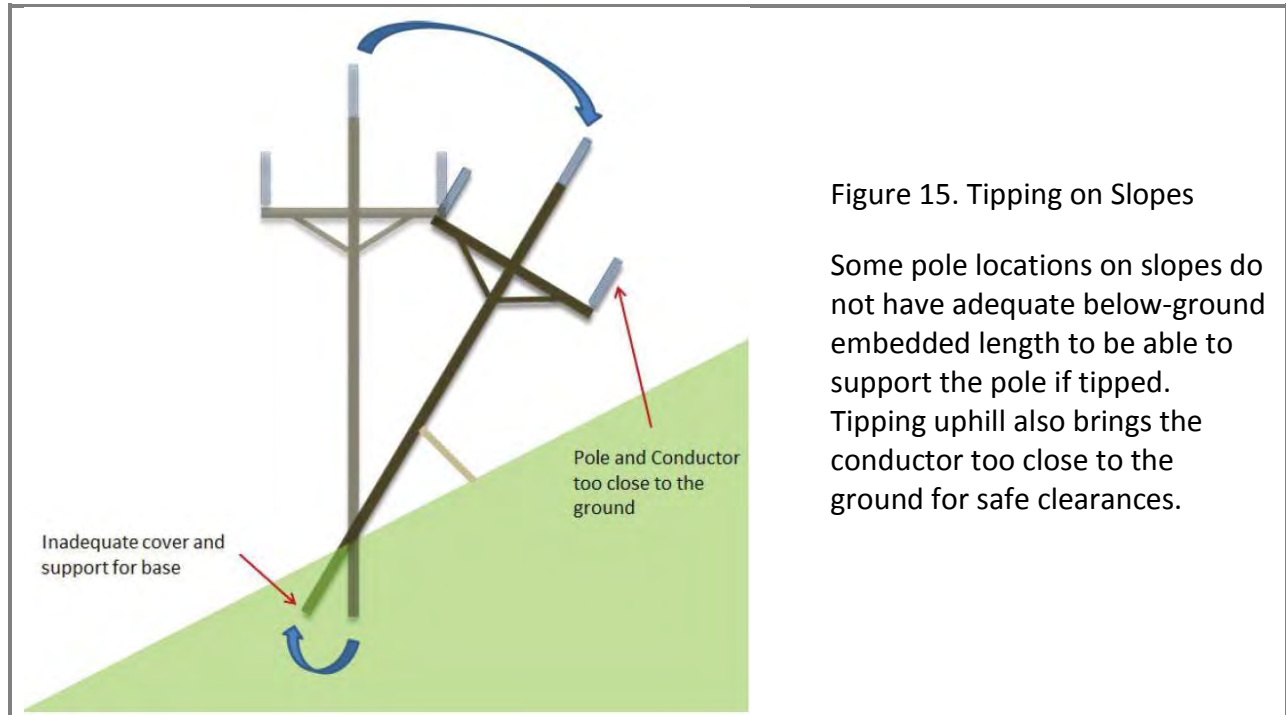


Figure 16. Picture of steep slope within existing transmission corridor



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Conductor: There is a risk of conductor failure when transferring over to new poles because it has been subjected to wind, ice, trees and lightning strikes. When conductors are moved tensions are increased due to dragging out of natural state increasing chances of failure and compromising the safety of the crew. Insulators also have been known to break when abnormal tensions applied.

Other challenges:

Figure 17. Multi-Pole Structures

H-frames & 3 pole structures cannot be tipped. In locations where there are multi-pole structures (10 on this line) it would be necessary to expand the right-of-way enough to build around those structures (see offset double circuit)

