Exhibit AA

Electromagnetic Frequencies from Transmission Lines

Sunstone Solar Project
June 2023

Prepared for

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Prepared by

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Acronyms and Abbreviations

AC	alternating current
ACSR	aluminum-conductor steel-reinforced
Applicant	Sunstone Solar, LLC, a subsidiary of Pine Gate Renewables, LLC
CAFE	Corona and Field Effect Program, Version 3, Bonneville Power Administration
dB	decibel
EFSC, or Council	Oregon Energy Facility Siting Council
ELF	extremely low frequency
EMF	electric and magnetic fields
EMR	electromagnetic radiation
Facility	Sunstone Solar Project
FCC	Federal Communications Commission
FIELDS	FIELDS EMF Model, Southern California Edison Company
GHz	gigahertz
GPS	Global Positioning System
Hz	hertz
kHz	kilohertz
kV	kilovolt
kV/m	kilovolt per meter
μV/m	microvolt per meter
mG	milligauss
MHz	megahertz
kcmil	thousand circular mil
OAR	Oregon Administrative Rule

1.0 Introduction

Sunstone Solar, LLC, a subsidiary of Pine Gate Renewables, LLC (Applicant), proposes to construct and operate the Sunstone Solar Project (Facility), a solar energy generation facility and related or supporting facilities in Morrow County, Oregon.

This Exhibit AA was prepared to meet the submittal requirements in Oregon Administrative Rule (OAR) 345-021-0010(1)(aa). Analysis in this exhibit demonstrates that the Facility complies with applicable Site Certificate conditions and the standard in OAR 345-021-0010(1)(aa). OAR 345 Division 22 does not provide an approval standard specific to Exhibit AA. This exhibit also includes the submittal requirements outlined in the Specific Standards for Transmission Lines under OAR 345-024-0090:

> *(1) Can design, construct and operate the proposed transmission line so that alternating current electric fields do not exceed 9 kV per meter at one meter above the ground surface in areas accessible to the public;*
>
> *(2) Can design, construct and operate the proposed transmission line so that induced currents resulting from the transmission line and related or supporting facilities will be as low as reasonably achievable.*

1.1 EMF Background Information

Electromagnetic fields (EMFs) occur both naturally and as a result of the generation, transmission, and use of electric power. The earth itself generates steady-state magnetic and electric fields. Electromagnetic fields are present around any conductors or devices that transmit or use electrical energy; as a result, exposure to EMF is common from an array of electrical appliances and equipment, building wiring, and electric distribution and transmission lines. The electrical power system in the United States is an alternating current (AC) system operating at a frequency of 60 hertz (Hz)[1], resulting in "power frequency" or "extremely low frequency (ELF)" EMF.[2] While electric and magnetic fields are often referred to and thought of collectively, each arises through a different mechanism and can have differing effects.

Electric fields around transmission lines are produced by the presence of an electric charge, measured as voltage, on the energized conductor. Electric field strength is directly proportional to the line's voltage; that is, increased voltage produces a stronger electric field. The strength of the electric field is inversely proportional to the square of distance from the conductors; the electric

[1] Hertz is a measure of cycles per second. In a 60-Hz transmission system, the charge and direction of current flow on each conductor will cycle from positive to negative and back to positive 60 times per second. The direction of force in the electric and magnetic fields will also cycle in direct relation to the charge and direction of flow on the conductor.

[2] The electric transmission system in the U.S. operates at 60 Hz, while in Europe and other parts of the world, the systems operate at 50 Hz; both produce fields that are referred to as power frequency or ELF EMF.

field strength declines as the distance from the conductor increases. The strength of the electric field is measured in units of kilovolts (kV) per meter (kV/m). Electric fields are readily weakened or blocked by conductive objects such as trees or buildings. The direction of force within the electric field alternates at a frequency of 60 Hz, in direct relation to the charge on each conductor. However, the overall transmission line voltage, and therefore the overall strength and reach of the electric field, remains practically steady and is not affected by the common daily and seasonal fluctuations in usage of electricity by customers.

Magnetic fields around transmission lines are produced by the movement of electrical charge, measured in terms of amperage, through the conductors. Like the electric field, the magnetic field alternates at a frequency of 60 Hz. Magnetic field strength is expressed in units of milligauss (mG).[3] The magnetic field strength is directly proportional to the amperage; that is, increased current flow resulting from increased power flow through the line produces a stronger magnetic field. As with electric fields, the magnetic field is inversely proportional to the square of the distance from the conductors, declining in strength as the distance from the conductor increases. Magnetic fields are not blocked or shielded by most materials. Unlike voltage, the amperage and the resulting magnetic field around a transmission line fluctuate daily and seasonally as the usage of electricity varies and the resulting amount of current flow varies.

Each AC three-phase circuit carries power over three conductors. One phase of the circuit is carried by each of the three conductors. The AC voltage and current in each phase conductor is out of sync with the other two phases by 120 degrees, or one-third of the 360-degree cycle. The fields from each of these conductors tend to cancel each other out because of this phase difference. However, since the conductors are separated from each other, when a person stands under a transmission line, one conductor is somewhat closer than the others and will contribute a net uncanceled field at the person's location.

1.2 EMF Standards

No federal regulations or guidelines apply directly to the EMF levels for transmission lines. The National Institute of Environmental Health Sciences performed an extensive review of field-related issues in the 1990s that resulted in the decision that regulatory actions are unwarranted (NIEHS 1999).

Although there are no federal regulations on power-frequency EMF in the United States, international recommendations and guidelines exist. Table AA-1 lists power-frequency EMF guidelines recommended by the European Union, the International Committee on Electromagnetic Safety, and the International Commission on Non-Ionizing Radiation Protection, which is an affiliate of the World Health Organization (EU 1999; ICES 2002; ICNIRP 2010).

[3] Magnetic field strength may also be measured in terms of the Tesla, an International System unit of measurement. 1 Gauss = 0.0001 Tesla, or 1 Tesla = 10,000 Gauss; 1 Gauss = 1,000 mG.

Table AA-1. International Guidelines for Alternating Current Power-Frequency EMF Levels

Agency	Exposure	Electric Field (kV/m)	Magnetic Field (mG)
European Union	General public	4.2	833
International Committee on Electromagnetic Safety [1]	Occupational	20	27,100
	General public	5	9,040
	General public within right-of-way	10	NA
International Commission on Non-Ionizing Radiation Protection	Occupational	8.3	10,000
	General public	4.2	2,000

Magnetic fields are measured in gauss (G) and milligauss. 1 G = 1,000 mG

NA = Not Applicable (no requirements)

1. International Committee on Electromagnetic Safety recommendations have been adopted as standards by the Institute of Electrical and Electronics Engineers; see Standard C95.6 -2002 (R2007).

Transmission line projects in Oregon must comply with the electric field standard found in OAR 345-024-0090, which requires that the applicant design, construct, and operate the proposed transmission line so that AC electric fields do not exceed 9 kV/m at 1 meter above the ground surface in areas accessible to the public. There is no similar Oregon design standard for magnetic fields.

Six other states have adopted limits for electric field strength either at the edge or within the right-of-way of the transmission line corridor. Only Florida and New York currently limit magnetic fields levels from transmission lines. The magnetic field levels set in those two states only apply at the edge of the right-of-way and were developed to prevent magnetic fields from increasing beyond levels currently experienced by the public. Table AA-2 shows the AC electric field and magnetic field standards that have been adopted by states in the United States.

Table AA-2. Other State Alternating Current Power-Frequency EMF Standards

State		Location	Electric Field (kV/m)	Magnetic Field (mG)
Florida	230 to 500 kV lines	Within right-of-way	10	NA
		Edge of right-of-way	2	200 [1]
	230 kV or less	Within right-of-way	8	NA
		Edge of right-of-way	2	150
Minnesota		Within right-of-way	8	NA
Montana		Within right-of-way: road crossing	7	NA
		Edge of right-of-way	1 [2]	NA
New Jersey		Within right-of-way	NA	NA
		Edge of right-of-way	3	NA
New York		Within right-of-way: open	11.8	NA
		Within right-of-way: public road	7	NA
		Within right-of-way: private road	11	NA
		Edge of right-of-way	1.6	200
North Dakota		Within right-of-way	9	NA
		Edge of right-of-way	NA	NA
Oregon		Within right-of-way	9	NA
		Edge of right-of-way	NA	NA

kV/m = kilovolt per meter; NA = Not Applicable (no requirements); mG = milligauss

1. Magnetic field strength is limited to 250 mG for new double-circuit 500-kV lines constructed on a previously existing right-of-way.

2. Can be waived by landowner.

In the fall of 2009, the Oregon Energy Facility Siting Council (EFSC or Council) commissioned a review of existing information to prepare for the review of several transmission lines under discussion at that time. That review was conducted by Dr. Kara Warner and presented to the Council on November 20, 2009, during a regular Council meeting. The prevailing conclusions were that there is a need to continue to monitor the science on EMF; that low-cost, prudent avoidance measures of public EMF exposure are appropriate; and that health-based limits are not appropriate given the scientific data available (EFSC 2009).

2.0 Proposed Transmission Lines

OAR 345-021-0010(1)(aa) Exhibit AA. If the proposed energy facility is a transmission line or has, as a related or supporting facility, a transmission line of any size:

(A) Information about the expected electric and magnetic fields, including:

The Project includes two 230-kV overhead transmission lines that would run approximately 6.3 miles (southern line) and 3.2 miles (northern line), respectively, including an approximately 1-mile stretch where the two lines run in parallel. Both overhead transmission lines connect the electrical collection substations to the two Project switchyards. The northern transmission line connects two Project substations, and the southern transmission line connects four Project substations. Details regarding the transmission line structures are further described in Section 2.3.

2.1 Assumptions and Methods Used in the Analysis

> *(vi) The assumptions and methods used in the electric and magnetic field analysis, including the current in amperes on each proposed transmission line.*

The following assumptions are used for the calculation of the electric and magnetic field analysis of the overhead transmission lines. The planned overhead transmission line configurations are shown in Figures AA-1 and AA-2. Assumptions for modeling are as follows:

- Environmental parameters – 1 inch of precipitation per hour, 2.0 miles per hour wind speed (for modeling wet-weather conditions), average elevation 1,160 feet above mean sea level.
- Height for both electrical and magnetic field measurements – 1 meter, or 3.28 feet above ground.
- Northern overhead line information:
    - Line amperage – 528 amps
    - Line voltage – 230-kV phase/phase or 132.9-kV phase/ground
    - Conductor type – Single 190 thousand circular mil (kcmil) aluminum-conductor steel-reinforced (ACSR) conductors, 1.504 inches in diameter
    - Ground wire – none identified
    - Minimum height of conductor from ground – 25 feet
    - A phase is located on the left arm of the transmission structure at 12 feet from center, B phase is located on the middle arm of the transmission structure, and C phase is located on the right arm of the transmission structure at 12 feet from center. Phasing is shown on Figure AA-1.
- Southern overhead line information:
    - Line amperage – 528 amps
    - Line voltage – 230-kV phase/phase or 132.9-kV phase/ground
    - Conductor type – Single 190 KCMIL ACSR conductors, 1.504 inches in diameter
    - Ground wire – none identified
    - Minimum height of conductor from ground – 25 feet
    - Conductor phasing is shown on Figure AA-2.

- Parallel line information:
  - Northern and southern overhead line information same as described above.
  - Centerline to centerline separation between the overhead line – 45 feet

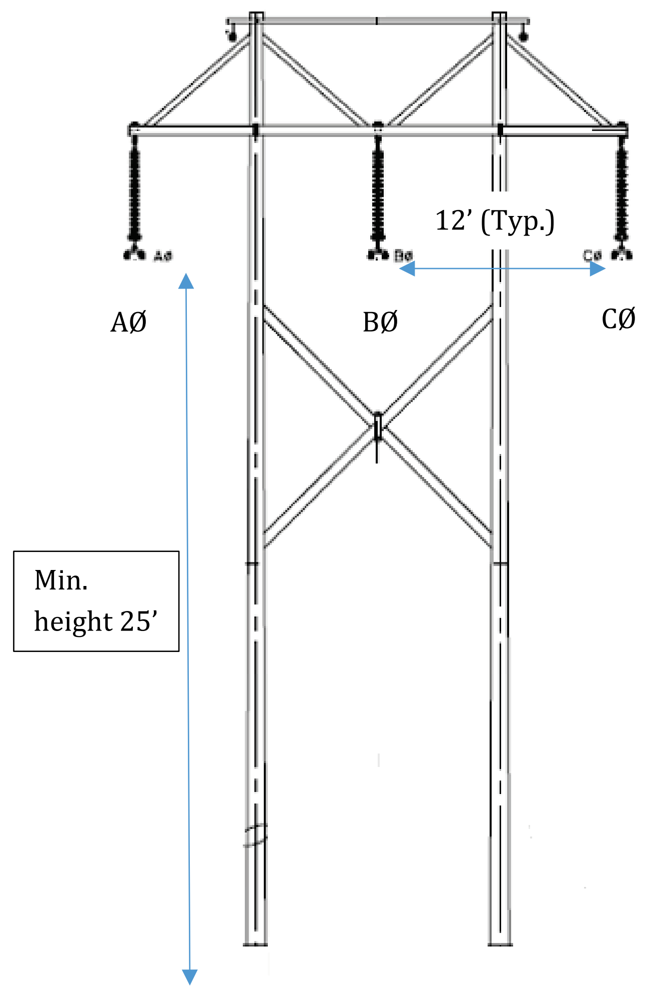


Figure AA-1. Preliminary Northern Overhead Transmission Line

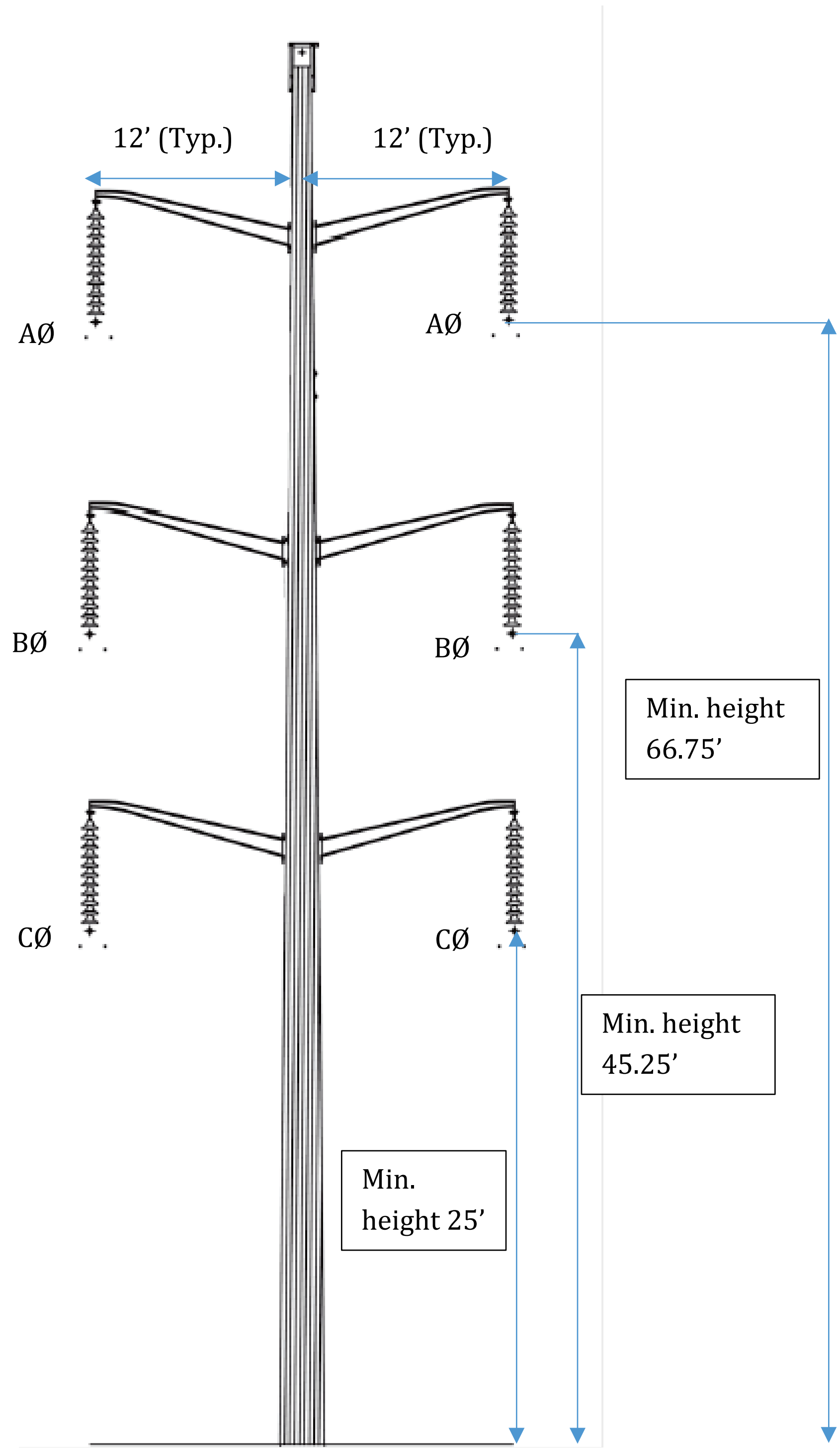


Figure AA-2. Preliminary Southern Overhead Transmission Line

2.2 Distance from Proposed Center Line

(i) The distance in feet from the proposed center line of each proposed transmission line to the edge of the right-of-way;

Both transmission lines have specific right-of-way widths defined but occupy private land pursuant to leases or easements with landowners or road authorities. The leases would authorize placement of the cables and restrict inconsistent or competing uses of the property, but will not contain any defined right-of-way with a fixed width. Therefore, no new right-of-way would be required, and no existing right-of-way would be widened. The analysis in this Exhibit AA examines field strength out to 200 feet from the centerline. In the case of the parallel transmission line segment, the analysis in this Exhibit AA examines field strength out to 200 feet from the outer centerline.

There are no known occupied buildings, residences, or other sensitive receptors within 200 feet of either overhead transmission lines or within the parallel transmission line segment. The nearest structure is located approximately 430 feet away from the proposed centerline of the northern transmission line.

2.3 Representative Field Strength along the Proposed Transmission Line

> *(iv) At representative locations along each proposed transmission line, a graph of the predicted electric and magnetic fields levels from the proposed center line to 200 feet on each side of the proposed center line;*

Table AA-3 shows calculated electric field values for the two overhead transmission lines. Table AA-4 shows calculated magnetic field values for the two overhead transmission lines.

Table AA-3. Calculated Electric Field Values

Line Description	Figure	Electric Field (kV/m)		
		200 feet Left	Peak Value	200 feet Right
Northern Transmission Line	AA-1 AA-3	0.021	2.873 (either 16 feet left or right of centerline)	0.022
Southern Transmision Line	AA-2 AA-4	0.147	5.287 (at centerline)	0.152
Parallel Transmission Lines	AA-5	0.185	6.144 (12 feet left of centerline)	0.167

Table AA-4. Calculated Magnetic Field Values

Line Description	Figure	Magnetic Field (mG)		
		200 feet Left	Peak Value	200 feet Right
Northern Transmission Line	AA-1 AA-6	1.8	116.9 (at centerline)	1.9
Southern Transmision Line	AA-2 AA-7	6.0	126.3 (either 12 feet left or right of centerline)	6.2
Parallel Transmission Lines	AA-8	8.2	189.0 (18 feet right of centerline)	5.2

The analysis results of the Bonneville Power Administration Corona and Fields Effect Program, Version 3 (CAFE) model presented in Table AA-4 demonstrate that the both transmission lines can be constructed and operated such that the AC electric field would not exceed 9 kV/m at 1 meter above the ground surface, as required by OAR 345-024-0090(1). See Figures AA-3, AA-4, and AA-5 for the electric field graph for the northern, southern, and parallel transmission lines (respectively), and Figures AA-5, AA-6, and AA-7 for the magnetic field graphs for the northern, southern, and parallel transmission lines (respectively). The analysis results for the northern and southern transmission lines (respectively) are provided in Attachments AA-1 and AA-2. The analysis results for the parallel transmission lines are in Attachment AA-3. The modeling assumptions related to the Facility are intentionally conservative, producing worst-case EMF results. EMF levels under normal operating conditions would be lower than indicated by this analysis.

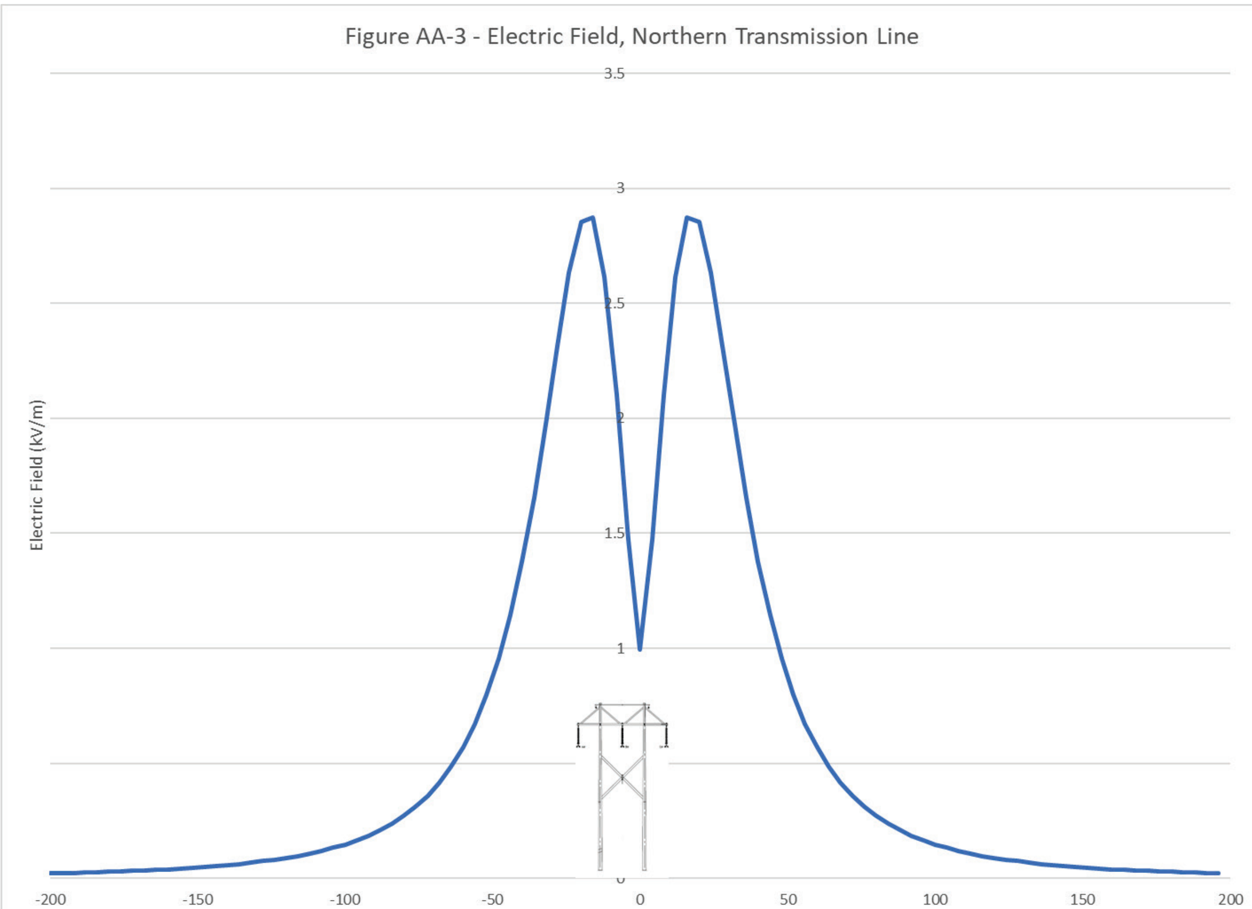


Figure AA-3. Electric Field Profile, Northern Transmission Line

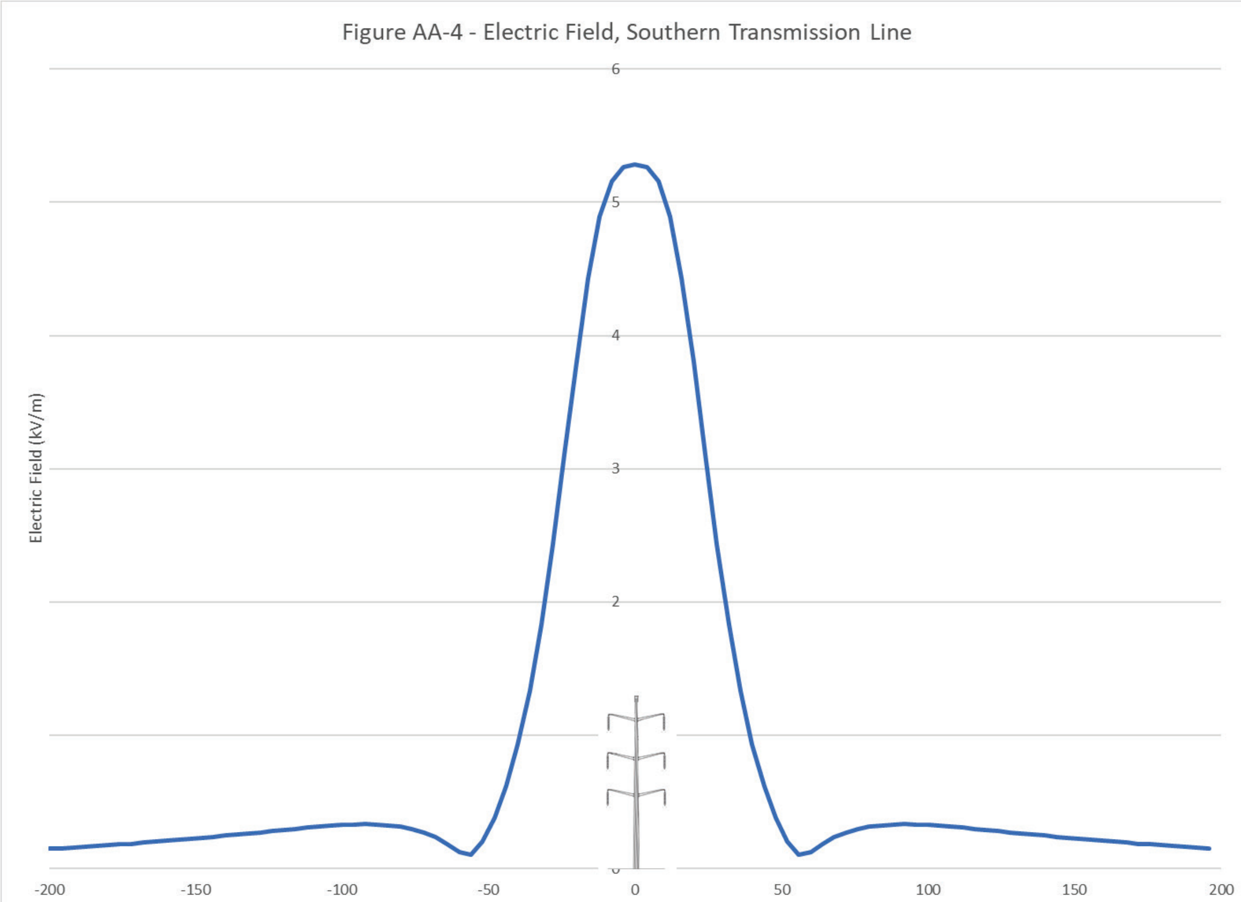


Figure AA-4. Electric Field Profile, Southern Transmission Line

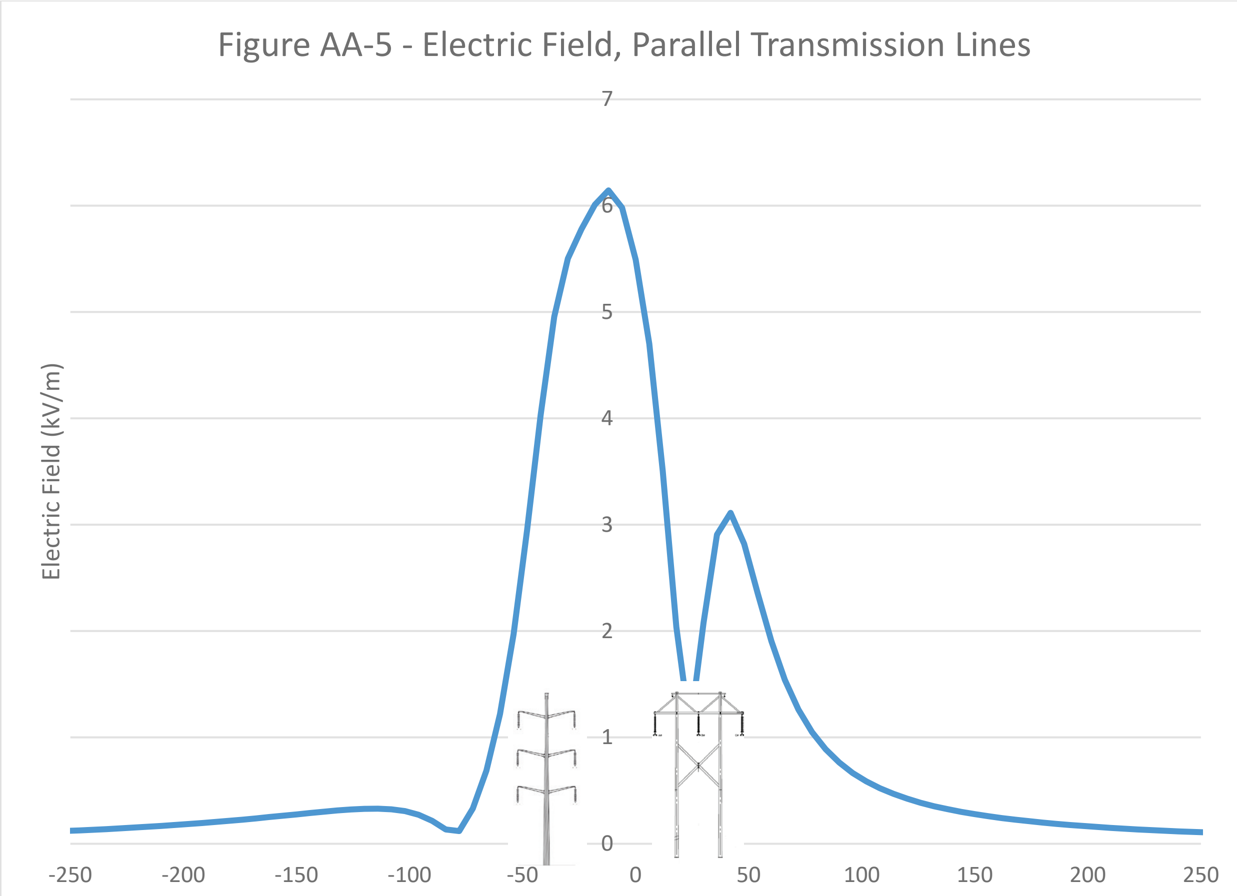


Figure AA-5. Electric Field Profile, Parallel Transmission Lines
Note: southern line to the left of origin, northern line to the right of origin

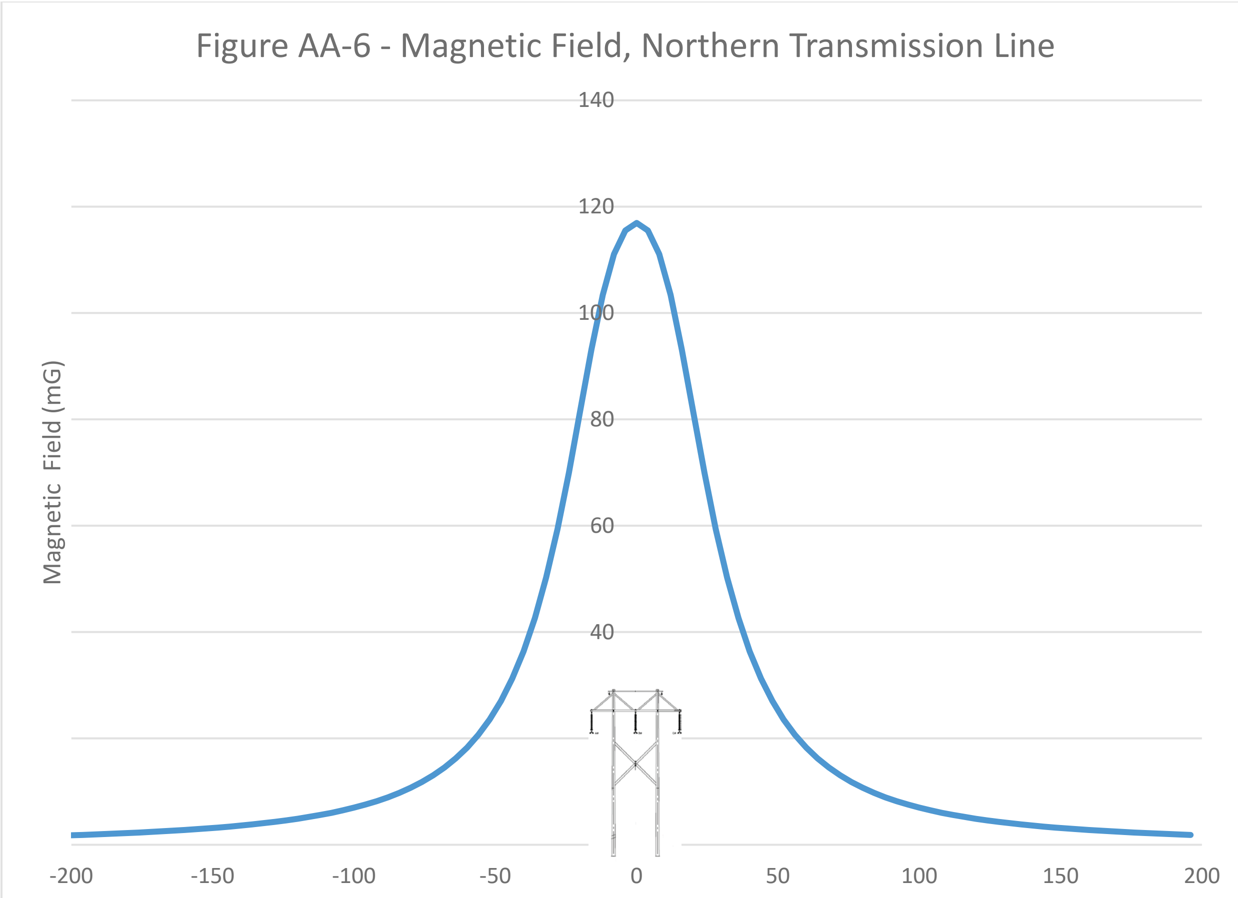


Figure AA-6. Magnetic Field Profile, Northern Transmission Line

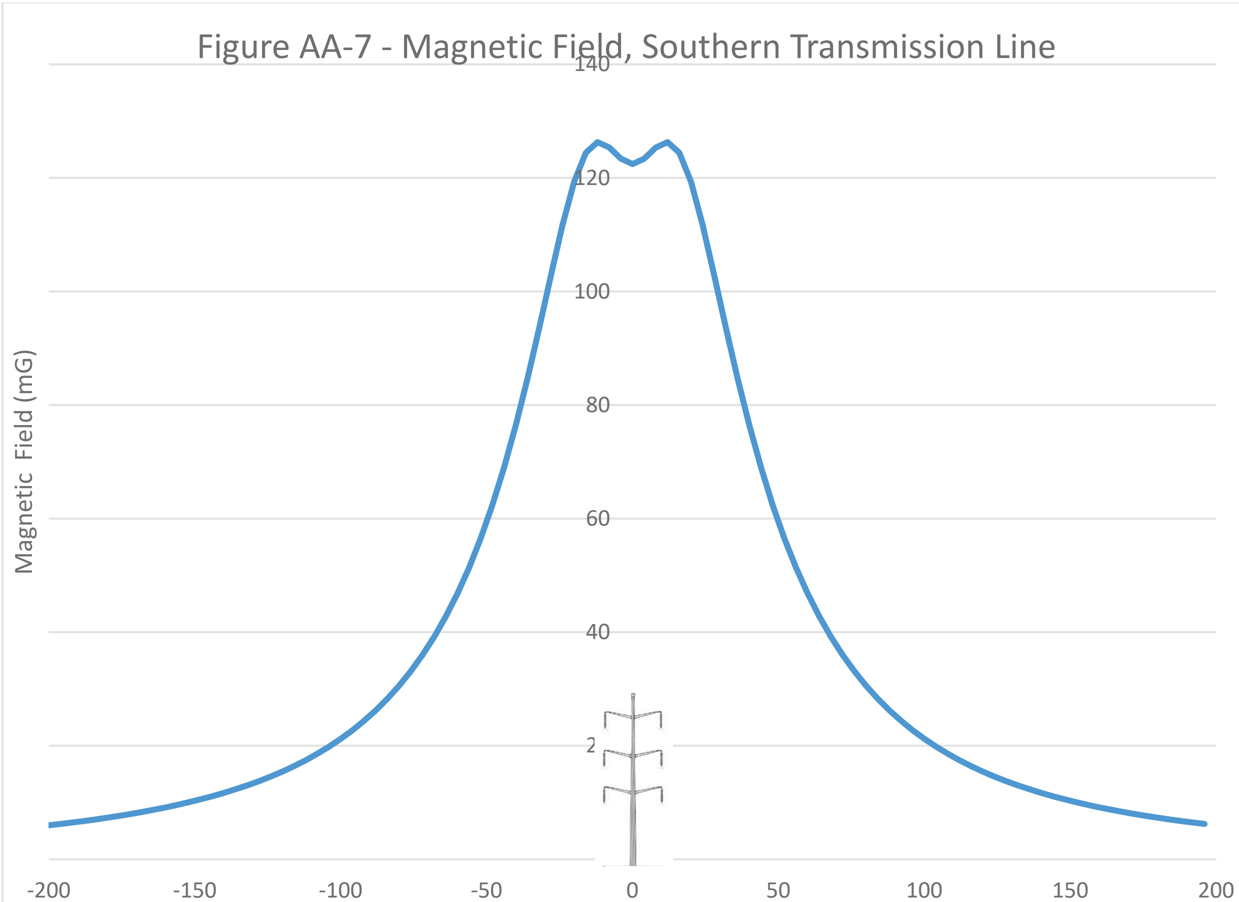


Figure AA-7. Magnetic Field Profile, Southern Transmission Line

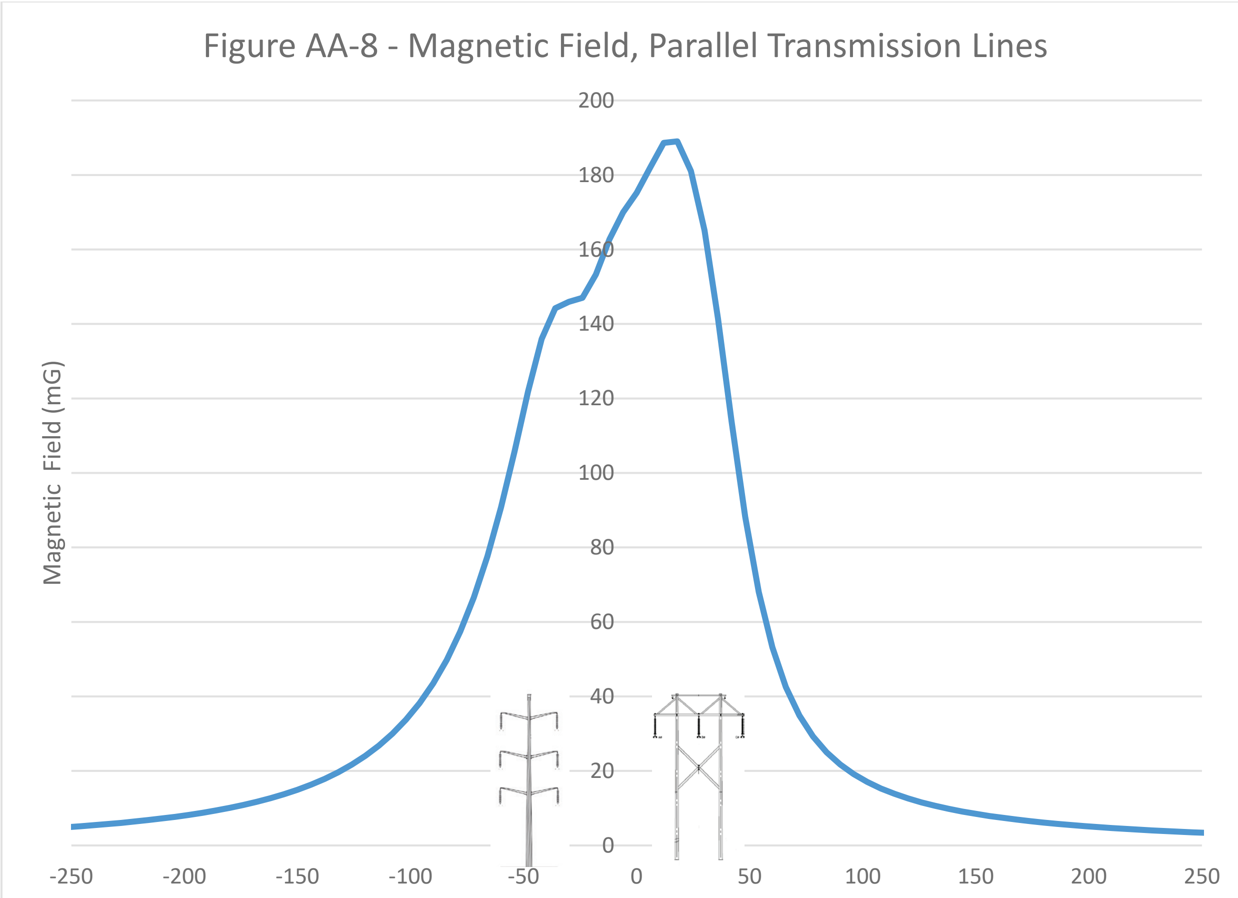


Figure AA-8. Magnetic Field Profile, Parallel Transmission Lines
Note: southern line to the left of origin, northern line to the right of origin

2.4 Mitigation Measures to Reduce Electric or Magnetic Fields

(v) Any measures the applicant proposes to reduce electric or magnetic field levels;

The highest electric fields within the ROW will be much less than the Oregon standard of 9 kV/m (see Section 2.3), and therefore no mitigation is required.

2.5 Proposed Monitoring Program

(vii) The applicant's proposed monitoring program, if any, for actual electric and magnetic field levels; and

As the maximum electrical fields modeled in Section 2.3 are lower than the 9-kV/m standard set forth in OAR 345-024-0090(1), no monitoring program is proposed by the Applicant.

3.0 Radio and TV Interference

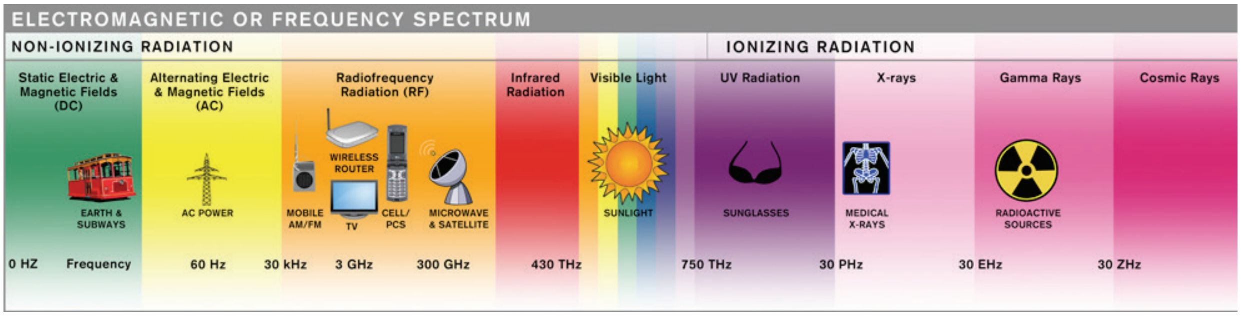
OAR 345-021-0010(1)(aa)(B) An evaluation of alternate methods and costs of reducing radio interference likely to be caused by the transmission line in the primary reception area near interstate, U.S. and state highways.

3.1 Background

3.1.1 Electromagnetic Interference

Electromagnetic interference from power transmission systems in the U.S. is governed by the Federal Communications Commission (FCC) Rules and Regulations (FCC 2023). A power transmission line is categorized by the FCC as an "incidental radiation device." An incidental radiation device is defined as "a device that radiates radio frequency energy during the course of its operation although the device is not intentionally designed to generate radio frequency energy." Such a device "shall be operated so that the radio frequency energy that is emitted does not cause harmful interference. In the event that harmful interference is caused, the operator of the device shall promptly take steps to eliminate the harmful interference." In this case, "harmful interference" is defined as "any emission, radiation or induction which endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radio communication service operating in accordance with this chapter" (FCC 2023). Oregon does not have regulatory standards for either radio or TV interference.

Modern communications systems all rely on electromagnetic radiation (EMR) to transmit information. AM and FM radio, TV, shortwave radio, cellular telephones, radar, Global Positiong System (GPS) devices and satellite communications, cordless telephones, Bluetooth, and wireless computer networks such as Wi-Fi or wireless local area network all utilize a region of the electromagnetic spectrum known as "radio frequency" EMR, which extends from the very low-frequency end at about 30 kilohertz (kHz) up into the high-frequency microwave range at about 300 gigahertz (GHz). Each type of technology uses a specific segment of the electromagnetic frequency spectrum; older technology such as AM radio is at the low-frequency end, while newer technologies such as GPS and Wi-Fi utilize high-frequency signals. Figure AA-7 provides a visual representation of typical communications frequencies.



Source: EMF & Radio Frequency Solutions. Available online at: http://www.emfrf.com/index.php/emf-rf/emf-overview/electromagnetic-spectrum-or-frequency-spectrum.html.

Figure AA-9. Communications Frequency Spectrum

The level of interference can be partially determined by how similar or different the signal frequency is compared to the noise frequency. In general, there is little interaction between signals of differing frequency; radio signals, TV signals, cellular phone signals, and GPS signals can all coexist in the same space and time without interfering with each other. For interference to occur, frequencies must be similar.

EMR and resulting interference can be an indirect product of electric transmission lines. EMR arises not from the lines themselves, but from the interaction of the strong electric field at the surface of the conductors and other energized components with the surrounding air. Two types of interactions may occur that create electromagnetic interference: corona discharge and gap discharge.

3.1.1.1 Corona Discharge

High-voltage power transmission lines generate a strong electric field at the surface of the conductor, which can be strong enough to split the surrounding air molecules, resulting in the emission of electromagnetic energy in the form of ultraviolet and near-ultraviolet light and broad-band radio frequency EMR (corona discharge also produces audible sound, which is addressed in Exhibit Y; audible sound is not discussed further in this exhibit). The former can sometimes be seen by humans under the right conditions or with specialized equipment, while the latter can sometimes be heard as electronic "noise," or interference with radio signal reception. Broadband corona EMR discharge typically occurs in the frequency spectrum from below 100 kHz to approximately 1,000 megahertz (MHz), which overlaps with the frequencies used for AM and FM radio and some TV signals. With sufficient corona activity, low-frequency radio and TV interference can be noticeable within a few hundred feet of the transmission line. These effects are most pronounced directly underneath the line conductors and decrease with distance from the transmission line.

Corona on a transmission line conductor depends on several factors such as operating voltage, conductor diameter, overall line geometry, weather conditions, and altitude. Conductor size, line voltage, and line geometry are taken into consideration when designing a transmission line so that the electric fields at the conductor surface are minimized. However, for a high-voltage line, any incidental irregularities on the conductor surface (for example, water droplets, dust, debris, and nicks or scratches in the conductor) act as points where the electric field may be intensified sufficiently to produce corona. Thus, the level of corona activity is elevated during foul weather when raindrops on the conductor surface act as points producing corona.

3.1.1.2 Gap Discharge

A gap discharge occurs when current arcs across a gap between two conductive objects. Gap discharges can produce radio noise in the lower frequencies (AM radio frequencies) and well into the microwave range (analog TV frequencies). These discharges can be produced by loose connections, a problem that more commonly occurs on low-voltage distribution lines but rarely occurs on high-voltage transmission lines (Trinh 2012). Unlike corona discharge, which may occur anywhere along a high-voltage transmission line conductor, gap discharge occurs at mechanical connectors and components that are used to hold the conductors in place. Gap discharge is controlled through proper construction and maintenance practices to ensure all mechanical connectors and components are properly assembled. Because gap discharge is an intermittent, temporary, and readily resolved problem, and results only in localized electrical interference issues, the potential for interference with TV signals or higher-frequency communications is not considered a significant problem.

3.1.2 Radio Interference Effects

The corona-induced broadband EMR from transmission lines can produce interference to AM signals, such as a commercial AM radio audio signal (i.e., radio noise) or the video portion of an older analog broadcast TV station (i.e., TV noise). Technologies that use frequency modulation, such as FM radio stations and the audio portion of older analog broadcast TV signals, are generally not affected by noise from a transmission line. As digital signal processing has been integrated into these communication systems, the potential interference impact of corona-generated radio noise has decreased.

The level of interference caused by radio noise from a transmission line to the reception of a radio signal depends on the location of the radio transmitter, the radio receiver, and the transmission line. A transmission line that is directly between a radio transmitter and a listener's receiver may be more likely to interfere with that listener's reception, whereas a transmission line behind or beside the listener in relation to the transmitter will not necessarily cause interference, depending on the radio receiver's antennae. The radio noise generated by a transmission line is very low in power and decreases rapidly as distance from the line increases. It is experienced only when in close proximity to the transmission line.

In general, complaints related to corona-generated interference are infrequent. Moreover, the advent of cable and satellite TV service, and the federally-mandated conversion to digital TV broadcast in June 2009 have greatly reduced the occurrence of corona-generated interference. Low-frequency corona-induced EMR does not interact with the higher-frequency satellite signals or with wired communication systems, while digital TV receivers are equipped with systems to filter out interference. Many radio stations also broadcast in digital, reducing the likelihood of corona-induced EMR interference. Electric power companies are able to operate very effectively under the present FCC rule because harmful interference can generally be eliminated or effectively mitigated.

Radio noise is measured in units of decibels (dB) based on its field strength referenced to a signal level of 1 microvolt per meter (IEEE 1986). Corona-induced radio noise during fair weather is calculated to be approximately 40 dB (dB-1 microvolt per meter [1 μV/m]) at the edge of the right-of-way. This is considered an acceptable level (IEEE 1971). When the transmission line is in proximity to roadways (for example, interstates or federal and state highways), such as when it passes over these roadways, radio interference may be experienced for short distances while in proximity to the line. Interference may be more noticeable near the line particularly during foul weather, when corona activity is elevated.

3.1.3 Interference with Other Electronic Communications

Wireless computer network systems, cell phones, GPS units, and satellite receivers operate at high frequencies in the tens to hundreds of MHz or even GHz. These systems also often use FM or digital coding of the signals so they are relatively immune to electromagnetic interference from transmission line corona. GPS units are used in a wide range of activities, including several important agricultural activities such as monitoring pivot irrigation, tracking wheeled and tracked equipment movements during farming operation, and checking the orientation of aerial spraying aircraft. GPS units operate in the frequency range of 1.2 to 1.6 GHz. Satellite receivers operate at frequencies of 3.4 GHz to 7 GHz and have shown no effect from transmission lines unless the receiver was trying to view the satellite through the transmission tower or conductor bundle of the transmission line (Chartier et al. 1986). Repositioning the receiver by a few feet was sufficient to eliminate the obstruction and reduced signal. Mobile phones operate in the radiofrequency range of about 800 MHz to 1,900 MHz or higher. As a result of the high frequencies used by these devices, modulation and processing techniques, and the typically lower-frequency corona-induced EMR, effects from interference are unlikely.

The voltages and currents associated with the interconnection line have the potential to induce voltage and current in nearby conductors (e.g., ungrounded metal fences and ungrounded metal irrigation systems). This effect is more likely where ungrounded fences or irrigation systems are parallel and long (1 mile or more). These induced voltages could result in a “nuisance” shock to anyone who touches such a fence or irrigation system. These shocks are known as nuisance or “startle” shocks as they will not physically harm someone but may be noticed by some people and provoke a startle reaction. An example of an ungrounded metal irrigation system would be a center pivot system on rubber tires. By contrast, the Vermeer-type metal irrigation system is grounded through its metal wheels and therefore presents less of a shock hazard.

A GPS unit in farming equipment should work properly within the vicinity of a transmission line. GPS devices continually pull signals from a number of satellites, not just one and may also utilize a fixed base station. A signal may be blocked temporarily if the transmission structure is between the receiver and a weak signal, but it will return as the farm equipment moves past the structure. It is also common for GPS receivers to drop and pick up signals even in the absence of transmission lines and structures. If the base station signal is weak or blocked, additional or alternate locations may improve the signal and performance.

Signal interference occurs when other signals at the same frequency as the satellite signal are present. Multipath occurs when objects such as buildings, structures, or tractor parts reflect a GPS satellite signal, causing the satellite signal to arrive at the receiver later than it would have if it followed a straight line from the satellite. A study commissioned by the Electric Power Research Institute found that signal interference is "unlikely" based on the design of GPS receivers and their ability to separate the GPS signal from background noise (Silva and Olsen 2002). Another study compared the accuracy of real-time kinematic GPS receivers at different locations to transmission lines and towers (Gibbings et al. 2001). This study concluded that multipath from transmission towers could result in GPS initialization errors (e.g., the system reports the wrong starting location) 1.1 percent to 2.3 percent of the time. This study also reported that GPS software was able to identify and correct these initialization errors within the normal startup time. This study reported initialization errors caused by electromagnetic interference from energized overhead transmission lines when the GPS receiver was located outside the vehicle, but concluded that "most, if not all of this effect can be eliminated by shielding the receiver and cables." Placing the receiver inside the vehicle significantly reduced initialization errors.

3.2 Evaluation of Alternate Methods and Costs to Reduce Interference

Design options for reducing the radio noise from the interconnection line include use of larger diameter conductors, or use of more conductors within the conductor bundles. Increasing the distance between phases of the lines (conductor bundles) may also result in a decrease in the radio noise. These line design options have been employed to minimize the generation of radio noise to acceptable levels.

4.0 Submittal Requirements and Approval Standards

4.1 Submittal Requirements

Table AA-5. Submittal Requirements Matrix

Requirement	Location
OAR 345-021-0010(1)(aa) Exhibit AA. If the proposed energy facility is a transmission line or has, as a related or supporting facility, a transmission line of any size:	–
(A) Information about the expected electric and magnetic fields, including:	Section 2.0
(i) The distance in feet from the proposed center line of each proposed transmission line to the edge of the right-of-way;	Section 2.2

Requirement	Location
(ii) The type of each occupied structure, including but not limited to residences, commercial establishments, industrial facilities, schools, daycare centers and hospitals, within 200 feet on each side of the proposed center line of each proposed transmission line;	Section 2.2
(iii) The approximate distance in feet from the proposed center line to each structure identified in (A);	Section 2.2
(iv) At representative locations along each proposed transmission line, a graph of the predicted electric and magnetic fields levels from the proposed center line to 200 feet on each side of the proposed center line;	Section 2.3
(v) Any measures the applicant proposes to reduce electric or magnetic field levels;	Section 2.4
(vi) The assumptions and methods used in the electric and magnetic field analysis, including the current in amperes on each proposed transmission line;	Section 2.1
(vii) The applicant's proposed monitoring program, if any, for actual electric and magnetic field levels; and	Section 2.5
(B) An evaluation of alternate methods and costs of reducing radio interference likely to be caused by the transmission line in the primary reception area near interstate, U.S. and state highways.	Section 3.0

4.2 Approval Standards

OAR 345 Division 21 does not provide an approval standard specific to Exhibit AA. However, compliance with OAR 345-024-0090 is demonstrated by the analysis above, as described in Exhibit DD.

5.0 References

Chartier, V., R. Sheridan, J. DiPlacido, and M. Loftness. 1986. Electromagnetic Interference Measurements at 900 MHz on 230 kV and 500 kV Transmission Lines. *IEEE Transactions on Power Systems,* PWRD-1: 140-149.

EE Online, 2023. Finding the Root Cause of Power Cable Failures. Available online at: https://electricenergyonline.com/show_article.php?article=186

EFSC (Oregon Energy Facility Siting Council). 2009. EMF Report: A Review of the Current Scientific Literature on Health Effects of Electric and Magnetic Fields. Oregon Department of Energy, Salem, OR.

EU (Council of the European Union). 1999. Council Recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields. Official Journal of the European Communities. 1999/199/59. Available online at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1999:199:0059:0070:EN:PDF

FCC (Federal Communications Commission) 2023. Title 47 Code of Federal Regulations Part 15, Radio Frequency Devices.

Gibbings, P., B. Manuel, R. Penington, and K. McDougall. 2001. Assessing the Accuracy and Integrity of RTK GPS Beneath High-voltage Power Lines. In: 42nd Australian Surveyors Congress 2001: A Spatial Odyessy, 25-28 Sep 2001, Brisbane, Australia.

ICES (International Committee on Electromagnetic Safety). 2002. IEEE Standard for Safety Levels with Respect to Human Exposure to Electromagnetic Fields 0 to 3 kHz C95. 6-2002. Piscataway, New Jersey.

IEEE (Institute of Electrical and Electronics Engineers). 1971. Radio Noise Design Guide for High Voltage Transmission Lines. IEEE Radio Noise Subcommittee Report-Working Group No. 3. Paper 70TP631-PWR.

IEEE. 1986. IEEE Standard Procedures for Measurement of Radio Noise from Overhead Power Lines and Substations. ANSI/IEEE Std. 430-1986, New York, NY.

ICNIRP (International Commission on Non-Ionizing Radiation Protection). 2010. Guidelines for limiting exposure to time-varying electric and magnetic fields (1 Hz to 100 kHz). Health Physics, 2010.

NIEHS (National Institute of Environmental Health Sciences). 1999. Health effects from exposure to powerline frequency electric and magnetic fields. NIH; National Institute of Health; NIH No. 99-4493; Research Triangle Park, North Carolina.

Silva, M., and R. Olsen. 2002. Use of Global Positioning System (GPS) Receivers Under Power-Line Conductors. *IEEE Transactions on Power Delivery* 17: 938–944.

Trinh, G.N. 2012. Chapter 16, Corona and Noise. In: *Electric Power Generation, Transmission, and Distribution*. 3rd Edition edited by Leonard L. Grigsby. CRC Press, Taylor & Francis Group LLC, Boca Raton, FL. ISBN: 9781439856284.

Attachment AA-1. Results of the Bonneville Power Administration Corona and Field Effects Program for the Northern Transmission Line

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ÛßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßÛ
Û       C O R O N A   A N D   F I E L D       Û
Û E F F E C T S   P R O G R A M   V E R.  3   Û
Û   Source: Bonneville Power Administration   Û
ÛÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÛ
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INPUT DATA LIST

```
                4/ 5/2023         20:37:12
 SUNSTONE SOLAR T LINE NORTHERN
 RUN 4 20230405
1,0, 3, 3,0.0,   2.00,   1.00,1160.00

(ENGLISH UNITS OPTION)

(GRADIENTS ARE COMPUTED BY PROGRAM)

PHYSICAL SYSTEM CONSISTS OF  3 CONDUCTORS, OF WHICH  3 ARE ENERGIZED PHASES

OPTIONS:  AN EF MF
  4.921,  6.562,  9.842,  1.000,  1.000, 75.000,  3.280,  6.700,  3.280
'A1      ','A',  -12.00,   25.00, 1,   1.504,    .000, 132.900,    .000,    .528,
 .000
'B1      ','A',     .00,   25.00, 1,   1.504,    .000, 132.900, 120.000,    .528,
 .000
'CA      ','A',   12.00,   25.00, 1,   1.504,    .000, 132.900, 240.000,    .528,
 .000
100 -200.0    4.0
1AUDIBLE NOISE CALCULATION - RAIN
```

DIST FROM REFERENCE (FEET)	TOTALS L5 (DBA)	L50 (DBA)	A1	B1	CA
-200.0	39.5	36.0	29.8	33.3	29.2
-196.0	39.6	36.1	29.9	33.4	29.3
-192.0	39.7	36.2	30.0	33.5	29.4
-188.0	39.8	36.3	30.1	33.6	29.5
-184.0	39.9	36.4	30.2	33.7	29.6
-180.0	40.0	36.5	30.3	33.9	29.7
-176.0	40.1	36.6	30.5	34.0	29.8
-172.0	40.2	36.7	30.6	34.1	29.9
-168.0	40.3	36.8	30.7	34.2	30.0
-164.0	40.4	36.9	30.8	34.3	30.1
-160.0	40.6	37.1	31.0	34.4	30.2
-156.0	40.7	37.2	31.1	34.5	30.3

-152.0	40.8	37.3	31.2	34.7	30.5
-148.0	40.9	37.4	31.4	34.8	30.6
-144.0	41.1	37.6	31.5	34.9	30.7
-140.0	41.2	37.7	31.7	35.1	30.8
-136.0	41.3	37.8	31.8	35.2	31.0
-132.0	41.5	38.0	32.0	35.4	31.1
-128.0	41.6	38.1	32.1	35.5	31.2
-124.0	41.8	38.3	32.3	35.7	31.4
-120.0	42.0	38.5	32.5	35.8	31.5
-116.0	42.1	38.6	32.7	36.0	31.7
-112.0	42.3	38.8	32.8	36.2	31.8
-108.0	42.5	39.0	33.0	36.3	32.0
-104.0	42.6	39.1	33.2	36.5	32.1
-100.0	42.8	39.3	33.5	36.7	32.3
-96.0	43.0	39.5	33.7	36.9	32.5
-92.0	43.2	39.7	33.9	37.1	32.7
-88.0	43.4	39.9	34.1	37.3	32.8
-84.0	43.7	40.2	34.4	37.5	33.0
-80.0	43.9	40.4	34.6	37.7	33.2
-76.0	44.1	40.6	34.9	38.0	33.5
-72.0	44.4	40.9	35.2	38.2	33.7
-68.0	44.7	41.2	35.5	38.5	33.9
-64.0	44.9	41.4	35.8	38.8	34.1
-60.0	45.2	41.7	36.2	39.1	34.4
-56.0	45.6	42.1	36.5	39.4	34.6
-52.0	45.9	42.4	36.9	39.7	34.9
-48.0	46.2	42.7	37.3	40.0	35.2
-44.0	46.6	43.1	37.8	40.4	35.5
-40.0	47.0	43.5	38.2	40.8	35.8
-36.0	47.4	43.9	38.7	41.2	36.2
-32.0	47.9	44.4	39.2	41.6	36.5
-28.0	48.3	44.8	39.7	42.1	36.9
-24.0	48.8	45.3	40.1	42.5	37.3
-20.0	49.2	45.7	40.5	43.0	37.8
-16.0	49.6	46.1	40.8	43.5	38.2
-12.0	50.0	46.5	40.9	44.0	38.7
-8.0	50.3	46.8	40.8	44.4	39.2
-4.0	50.5	47.0	40.5	44.6	39.7
.0	50.5	47.0	40.1	44.7	40.1
4.0	50.5	47.0	39.7	44.6	40.5
8.0	50.3	46.8	39.2	44.4	40.8
12.0	50.0	46.5	38.7	44.0	40.9
16.0	49.6	46.1	38.2	43.5	40.8
20.0	49.2	45.7	37.8	43.0	40.5
24.0	48.8	45.3	37.3	42.5	40.1
28.0	48.3	44.8	36.9	42.1	39.7
32.0	47.9	44.4	36.5	41.6	39.2
36.0	47.4	43.9	36.2	41.2	38.7
40.0	47.0	43.5	35.8	40.8	38.2
44.0	46.6	43.1	35.5	40.4	37.8

48.0	46.2	42.7	35.2	40.0	37.3
52.0	45.9	42.4	34.9	39.7	36.9
56.0	45.6	42.1	34.6	39.4	36.5
60.0	45.2	41.7	34.4	39.1	36.2
64.0	44.9	41.4	34.1	38.8	35.8
68.0	44.7	41.2	33.9	38.5	35.5
72.0	44.4	40.9	33.7	38.2	35.2
76.0	44.1	40.6	33.5	38.0	34.9
80.0	43.9	40.4	33.2	37.7	34.6
84.0	43.7	40.2	33.0	37.5	34.4
88.0	43.4	39.9	32.8	37.3	34.1
92.0	43.2	39.7	32.7	37.1	33.9
96.0	43.0	39.5	32.5	36.9	33.7
100.0	42.8	39.3	32.3	36.7	33.5
104.0	42.6	39.1	32.1	36.5	33.2
108.0	42.5	39.0	32.0	36.3	33.0
112.0	42.3	38.8	31.8	36.2	32.8
116.0	42.1	38.6	31.7	36.0	32.7
120.0	42.0	38.5	31.5	35.8	32.5
124.0	41.8	38.3	31.4	35.7	32.3
128.0	41.6	38.1	31.2	35.5	32.1
132.0	41.5	38.0	31.1	35.4	32.0
136.0	41.3	37.8	31.0	35.2	31.8
140.0	41.2	37.7	30.8	35.1	31.7
144.0	41.1	37.6	30.7	34.9	31.5
148.0	40.9	37.4	30.6	34.8	31.4
152.0	40.8	37.3	30.5	34.7	31.2
156.0	40.7	37.2	30.3	34.5	31.1
160.0	40.6	37.1	30.2	34.4	31.0
164.0	40.4	36.9	30.1	34.3	30.8
168.0	40.3	36.8	30.0	34.2	30.7
172.0	40.2	36.7	29.9	34.1	30.6
176.0	40.1	36.6	29.8	34.0	30.5
180.0	40.0	36.5	29.7	33.9	30.3
184.0	39.9	36.4	29.6	33.7	30.2
188.0	39.8	36.3	29.5	33.6	30.1
192.0	39.7	36.2	29.4	33.5	30.0
196.0	39.6	36.1	29.3	33.4	29.9

1AUDIBLE NOISE CALCULATION - FAIR

DIST FROM REFERENCE (FEET)	TOTALS L5 (DBA)	L50 (DBA)	A1	B1	CA
-200.0	14.5	11.0	4.8	8.3	4.2
-196.0	14.6	11.1	4.9	8.4	4.3
-192.0	14.7	11.2	5.0	8.5	4.4
-188.0	14.8	11.3	5.1	8.6	4.5

-184.0	14.9	11.4	5.2	8.7	4.6
-180.0	15.0	11.5	5.3	8.9	4.7
-176.0	15.1	11.6	5.5	9.0	4.8
-172.0	15.2	11.7	5.6	9.1	4.9
-168.0	15.3	11.8	5.7	9.2	5.0
-164.0	15.4	11.9	5.8	9.3	5.1
-160.0	15.6	12.1	6.0	9.4	5.2
-156.0	15.7	12.2	6.1	9.5	5.3
-152.0	15.8	12.3	6.2	9.7	5.5
-148.0	15.9	12.4	6.4	9.8	5.6
-144.0	16.1	12.6	6.5	9.9	5.7
-140.0	16.2	12.7	6.7	10.1	5.8
-136.0	16.3	12.8	6.8	10.2	6.0
-132.0	16.5	13.0	7.0	10.4	6.1
-128.0	16.6	13.1	7.1	10.5	6.2
-124.0	16.8	13.3	7.3	10.7	6.4
-120.0	17.0	13.5	7.5	10.8	6.5
-116.0	17.1	13.6	7.7	11.0	6.7
-112.0	17.3	13.8	7.8	11.2	6.8
-108.0	17.5	14.0	8.0	11.3	7.0
-104.0	17.6	14.1	8.2	11.5	7.1
-100.0	17.8	14.3	8.5	11.7	7.3
-96.0	18.0	14.5	8.7	11.9	7.5
-92.0	18.2	14.7	8.9	12.1	7.7
-88.0	18.4	14.9	9.1	12.3	7.8
-84.0	18.7	15.2	9.4	12.5	8.0
-80.0	18.9	15.4	9.6	12.7	8.2
-76.0	19.1	15.6	9.9	13.0	8.5
-72.0	19.4	15.9	10.2	13.2	8.7
-68.0	19.7	16.2	10.5	13.5	8.9
-64.0	19.9	16.4	10.8	13.8	9.1
-60.0	20.2	16.7	11.2	14.1	9.4
-56.0	20.6	17.1	11.5	14.4	9.6
-52.0	20.9	17.4	11.9	14.7	9.9
-48.0	21.2	17.7	12.3	15.0	10.2
-44.0	21.6	18.1	12.8	15.4	10.5
-40.0	22.0	18.5	13.2	15.8	10.8
-36.0	22.4	18.9	13.7	16.2	11.2
-32.0	22.9	19.4	14.2	16.6	11.5
-28.0	23.3	19.8	14.7	17.1	11.9
-24.0	23.8	20.3	15.1	17.5	12.3
-20.0	24.2	20.7	15.5	18.0	12.8
-16.0	24.6	21.1	15.8	18.5	13.2
-12.0	25.0	21.5	15.9	19.0	13.7
-8.0	25.3	21.8	15.8	19.4	14.2
-4.0	25.5	22.0	15.5	19.6	14.7
.0	25.5	22.0	15.1	19.7	15.1
4.0	25.5	22.0	14.7	19.6	15.5
8.0	25.3	21.8	14.2	19.4	15.8
12.0	25.0	21.5	13.7	19.0	15.9

16.0	24.6	21.1	13.2	18.5	15.8
20.0	24.2	20.7	12.8	18.0	15.5
24.0	23.8	20.3	12.3	17.5	15.1
28.0	23.3	19.8	11.9	17.1	14.7
32.0	22.9	19.4	11.5	16.6	14.2
36.0	22.4	18.9	11.2	16.2	13.7
40.0	22.0	18.5	10.8	15.8	13.2
44.0	21.6	18.1	10.5	15.4	12.8
48.0	21.2	17.7	10.2	15.0	12.3
52.0	20.9	17.4	9.9	14.7	11.9
56.0	20.6	17.1	9.6	14.4	11.5
60.0	20.2	16.7	9.4	14.1	11.2
64.0	19.9	16.4	9.1	13.8	10.8
68.0	19.7	16.2	8.9	13.5	10.5
72.0	19.4	15.9	8.7	13.2	10.2
76.0	19.1	15.6	8.5	13.0	9.9
80.0	18.9	15.4	8.2	12.7	9.6
84.0	18.7	15.2	8.0	12.5	9.4
88.0	18.4	14.9	7.8	12.3	9.1
92.0	18.2	14.7	7.7	12.1	8.9
96.0	18.0	14.5	7.5	11.9	8.7
100.0	17.8	14.3	7.3	11.7	8.5
104.0	17.6	14.1	7.1	11.5	8.2
108.0	17.5	14.0	7.0	11.3	8.0
112.0	17.3	13.8	6.8	11.2	7.8
116.0	17.1	13.6	6.7	11.0	7.7
120.0	17.0	13.5	6.5	10.8	7.5
124.0	16.8	13.3	6.4	10.7	7.3
128.0	16.6	13.1	6.2	10.5	7.1
132.0	16.5	13.0	6.1	10.4	7.0
136.0	16.3	12.8	6.0	10.2	6.8
140.0	16.2	12.7	5.8	10.1	6.7
144.0	16.1	12.6	5.7	9.9	6.5
148.0	15.9	12.4	5.6	9.8	6.4
152.0	15.8	12.3	5.5	9.7	6.2
156.0	15.7	12.2	5.3	9.5	6.1
160.0	15.6	12.1	5.2	9.4	6.0
164.0	15.4	11.9	5.1	9.3	5.8
168.0	15.3	11.8	5.0	9.2	5.7
172.0	15.2	11.7	4.9	9.1	5.6
176.0	15.1	11.6	4.8	9.0	5.5
180.0	15.0	11.5	4.7	8.9	5.3
184.0	14.9	11.4	4.6	8.7	5.2
188.0	14.8	11.3	4.5	8.6	5.1
192.0	14.7	11.2	4.4	8.5	5.0
196.0	14.6	11.1	4.3	8.4	4.9

1ELECTRIC FIELD CALCULATIONS

SUNSTONE SOLAR T LINE NORTHERN

RUN 4 20230405

	DIST. FROM REFERENCE FEET	HEIGHT FEET	MAXIMUM GRADIENT (KV/CM)	SUBCON. DIAM. (IN)	NO. OF SUBCON.	PHASE ANGLE (DEGREES)
A1	-12.00	25.00	12.61	1.50	1	.0
B1	.00	25.00	13.57	1.50	1	120.0
CA	12.00	25.00	12.61	1.50	1	240.0

SENSOR HT. = 3.3 FEET

DIST FROM REFERENCE FEET	E-FIELD (KV/METER)	THETA (DEGREES)	EY-FIELD (KV/METER)	THETAY (DEGREES)	EX-FIELD (KV/METER)	THETAX (DEGREES)	SPACE POTENTIAL (VOLTS)
-200.0	.021	87.3	.021	-173.9	.001	-168.6	20.7
-196.0	.022	87.3	.022	-173.6	.001	-168.4	21.9
-192.0	.023	87.2	.023	-173.3	.001	-168.2	23.2
-188.0	.025	87.2	.025	-173.0	.001	-168.1	24.6
-184.0	.026	87.1	.026	-172.7	.001	-167.9	26.2
-180.0	.028	87.0	.028	-172.4	.001	-167.7	27.9
-176.0	.030	87.0	.030	-172.1	.002	-167.6	29.7
-172.0	.032	86.9	.032	-171.8	.002	-167.4	31.7
-168.0	.034	86.8	.034	-171.5	.002	-167.3	33.9
-164.0	.036	86.7	.036	-171.2	.002	-167.1	36.3
-160.0	.039	86.7	.039	-170.9	.002	-167.0	39.0
-156.0	.042	86.6	.042	-170.7	.003	-166.8	41.9
-152.0	.045	86.5	.045	-170.4	.003	-166.7	45.1
-148.0	.049	86.4	.049	-170.1	.003	-166.6	48.7
-144.0	.053	86.3	.053	-169.8	.003	-166.5	52.6
-140.0	.057	86.2	.057	-169.6	.004	-166.4	57.0
-136.0	.062	86.1	.062	-169.3	.004		

-166.2	61.9				
-132.0	.067	86.0	.067	-169.1	.005
-166.2	67.4				
-128.0	.074	85.8	.073	-168.8	.005
-166.1	73.5				
-124.0	.080	85.7	.080	-168.6	.006
-166.0	80.4				
-120.0	.088	85.6	.088	-168.3	.007
-165.9	88.2				
-116.0	.097	85.4	.097	-168.1	.008
-165.9	97.1				
-112.0	.107	85.3	.107	-167.9	.009
-165.8	107.2				
-108.0	.119	85.1	.118	-167.7	.010
-165.8	118.7				
-104.0	.132	85.0	.131	-167.5	.012
-165.8	131.9				
-100.0	.147	84.8	.147	-167.3	.013
-165.7	147.1				
-96.0	.165	84.6	.164	-167.2	.016
-165.7	164.7				
-92.0	.185	84.4	.184	-167.0	.018
-165.8	185.2				
-88.0	.209	84.2	.208	-166.9	.021
-165.8	209.1				
-84.0	.238	83.9	.236	-166.7	.025
-165.8	237.3				
-80.0	.271	83.7	.269	-166.6	.030
-165.9	270.6				
-76.0	.311	83.4	.309	-166.5	.035
-166.0	310.2				
-72.0	.358	83.2	.356	-166.5	.043
-166.0	357.6				
-68.0	.415	82.9	.412	-166.4	.051
-166.1	414.6				
-64.0	.484	82.6	.480	-166.4	.062
-166.2	483.6				
-60.0	.569	82.3	.564	-166.4	.076
-166.3	567.7				
-56.0	.672	82.0	.665	-166.4	.093
-166.4	670.5				
-52.0	.799	81.8	.790	-166.4	.114
-166.4	796.6				
-48.0	.954	81.5	.944	-166.4	.141
-166.3	951.6				
-44.0	1.146	81.4	1.133	-166.3	.172
-166.0	1141.4				
-40.0	1.378	81.4	1.362	-166.3	.207
-165.5	1371.8				
-36.0	1.655	81.6	1.637	-166.1	.242

-164.4	1645.9				
-32.0	1.974	82.2	1.955	-165.7	.270
-162.3	1959.3				
-28.0	2.315	83.3	2.299	-165.0	.273
-157.9	2292.7				
-24.0	2.634	85.2	2.625	-163.8	.232
-147.1	2600.5				
-20.0	2.854	88.1	2.853	-161.6	.155
-109.4	2803.5				
-16.0	2.873	92.3	2.871	-157.6	.237
-38.9	2800.8				
-12.0	2.617	97.9	2.592	-150.6	.482
-12.9	2515.8				
-8.0	2.102	105.4	2.030	-137.8	.709
.7	1964.1				
-4.0	1.471	115.0	1.359	-112.3	.839
14.3	1300.1				
.0	.993	90.0	.993	-60.0	.875
30.0	926.1				
4.0	1.471	65.0	1.359	-7.7	.839
45.7	1300.1				
8.0	2.102	74.6	2.030	17.8	.709
59.3	1964.0				
12.0	2.617	82.1	2.592	30.6	.482
72.9	2515.8				
16.0	2.873	87.7	2.871	37.6	.237
98.9	2800.8				
20.0	2.854	91.9	2.853	41.6	.155
169.4	2803.5				
24.0	2.634	94.8	2.625	43.8	.232
-152.9	2600.5				
28.0	2.315	96.7	2.299	45.0	.273
-142.1	2292.7				
32.0	1.974	97.8	1.955	45.7	.270
-137.7	1959.3				
36.0	1.655	98.4	1.637	46.1	.242
-135.6	1645.9				
40.0	1.378	98.6	1.362	46.3	.207
-134.5	1371.8				
44.0	1.146	98.6	1.133	46.3	.172
-134.0	1141.4				
48.0	.954	98.5	.944	46.4	.141
-133.7	951.6				
52.0	.799	98.2	.790	46.4	.114
-133.6	796.6				
56.0	.672	98.0	.665	46.4	.093
-133.6	670.4				
60.0	.569	97.7	.564	46.4	.076
-133.7	567.7				
64.0	.484	97.4	.480	46.4	.062

-133.8	483.6				
68.0	.415	97.1	.412	46.4	.051
-133.9	414.6				
72.0	.358	96.8	.356	46.5	.043
-134.0	357.6				
76.0	.311	96.6	.309	46.5	.035
-134.0	310.2				
80.0	.271	96.3	.269	46.6	.030
-134.1	270.6				
84.0	.238	96.1	.236	46.7	.025
-134.2	237.3				
88.0	.209	95.8	.208	46.9	.021
-134.2	209.1				
92.0	.185	95.6	.184	47.0	.018
-134.2	185.2				
96.0	.165	95.4	.164	47.2	.016
-134.3	164.7				
100.0	.147	95.2	.147	47.3	.013
-134.3	147.1				
104.0	.132	95.0	.131	47.5	.012
-134.2	131.9				
108.0	.119	94.9	.118	47.7	.010
-134.2	118.7				
112.0	.107	94.7	.107	47.9	.009
-134.2	107.2				
116.0	.097	94.6	.097	48.1	.008
-134.1	97.1				
120.0	.088	94.4	.088	48.3	.007
-134.1	88.2				
124.0	.080	94.3	.080	48.6	.006
-134.0	80.4				
128.0	.074	94.2	.073	48.8	.005
-133.9	73.5				
132.0	.067	94.0	.067	49.1	.005
-133.8	67.4				
136.0	.062	93.9	.062	49.3	.004
-133.8	61.9				
140.0	.057	93.8	.057	49.6	.004
-133.6	57.0				
144.0	.053	93.7	.053	49.8	.003
-133.5	52.6				
148.0	.049	93.6	.049	50.1	.003
-133.4	48.7				
152.0	.045	93.5	.045	50.4	.003
-133.3	45.1				
156.0	.042	93.4	.042	50.7	.003
-133.2	41.9				
160.0	.039	93.3	.039	50.9	.002
-133.0	39.0				
164.0	.036	93.3	.036	51.2	.002

-132.9	36.3				
168.0	.034	93.2	.034	51.5	.002
-132.7	33.9				
172.0	.032	93.1	.032	51.8	.002
-132.6	31.7				
176.0	.030	93.0	.030	52.1	.002
-132.4	29.7				
180.0	.028	93.0	.028	52.4	.001
-132.3	27.9				
184.0	.026	92.9	.026	52.7	.001
-132.1	26.2				
188.0	.025	92.8	.025	53.0	.001
-131.9	24.6				
192.0	.023	92.8	.023	53.3	.001
-131.8	23.2				
196.0	.022	92.7	.022	53.6	.001
-131.6	21.9				

1MAGNETIC FIELD CALCULATIONS

SENSOR HT. = 3.3 FEET

DIST FROM REFERENCE FEET	B-FIELD (GAUSS)	THETA	BY-FIELD (GAUSS)	THETAY	BX-FIELD (GAUSS)	THETAX
-200.0	.00178651	-77.6	.00174452	208.1	.00038512	27.1
-196.0	.00185958	-77.3	.00181407	208.0	.00040892	27.0
-192.0	.00193721	-77.0	.00188782	208.0	.00043473	27.0
-188.0	.00201979	-76.8	.00196609	208.0	.00046274	26.9
-184.0	.00210775	-76.5	.00204926	207.9	.00049320	26.8
-180.0	.00220157	-76.2	.00213774	207.9	.00052639	26.8
-176.0	.00230176	-75.9	.00223197	207.8	.00056260	26.7
-172.0	.00240893	-75.5	.00233247	207.8	.00060221	26.6
-168.0	.00252373	-75.2	.00243979	207.8	.00064561	26.5
-164.0	.00264690	-74.8	.00255454	207.7	.00069326	26.5
-160.0	.00277927	-74.4	.00267741	207.7	.00074570	26.4
-156.0	.00292177	-74.0	.00280917	207.6	.00080353	26.3
-152.0	.00307547	-73.6	.00295066	207.5	.00086747	26.2
-148.0	.00324155	-73.2	.00310285	207.5	.00093834	26.1
-144.0	.00342139	-72.7	.00326680	207.4	.00101710	26.0
-140.0	.00361652	-72.2	.00344372	207.4	.00110486	25.9
-136.0	.00382872	-71.7	.00363495	207.3	.00120296	25.8
-132.0	.00406002	-71.1	.00384203	207.2	.00131293	25.7
-128.0	.00431278	-70.5	.00406666	207.2	.00143661	25.5
-124.0	.00458971	-69.9	.00431079	207.1	.00157620	25.4
-120.0	.00489396	-69.3	.00457662	207.0	.00173430	25.3
-116.0	.00522920	-68.5	.00486663	206.9	.00191406	25.1
-112.0	.00559974	-67.8	.00518362	206.9	.00211926	25.0

-108.0	.00601066	-66.9	.00553080	206.8	.00235453	24.8
-104.0	.00646797	-66.1	.00591175	206.7	.00262548	24.6
-100.0	.00697880	-65.1	.00633054	206.6	.00293904	24.4
-96.0	.00755172	-64.1	.00679171	206.5	.00330377	24.3
-92.0	.00819701	-62.9	.00730030	206.4	.00373033	24.0
-88.0	.00892713	-61.7	.00786190	206.3	.00423209	23.8
-84.0	.00975727	-60.4	.00848247	206.2	.00482593	23.6
-80.0	.01070605	-58.9	.00916820	206.1	.00553335	23.3
-76.0	.01179650	-57.3	.00992516	206.1	.00638187	23.0
-72.0	.01305722	-55.5	.01075853	206.0	.00740701	22.8
-68.0	.01452406	-53.5	.01167137	206.0	.00865495	22.5
-64.0	.01624216	-51.2	.01266231	206.0	.01018600	22.1
-60.0	.01826877	-48.7	.01372171	206.0	.01207928	21.8
-56.0	.02067670	-45.8	.01482491	206.2	.01443865	21.4
-52.0	.02355877	-42.4	.01592090	206.4	.01739986	21.1
-48.0	.02703286	-38.6	.01691322	207.0	.02113779	20.7
-44.0	.03124695	-34.2	.01762903	207.9	.02587051	20.4
-40.0	.03638186	-29.0	.01777238	209.7	.03185154	20.1
-36.0	.04264616	-22.8	.01686777	213.1	.03932988	19.9
-32.0	.05025183	-15.5	.01426755	221.0	.04843702	19.9
-28.0	.05935001	-6.8	.00986320	245.4	.05893521	20.3
-24.0	.06990122	3.5	.01065274	-45.7	.06977464	21.3
-20.0	.08148047	15.5	.02549598	-10.5	.07859349	23.4
-16.0	.09311727	29.2	.04830693	1.1	.08179650	27.4
-12.0	.10341060	44.1	.07415134	7.9	.07622311	34.9
-8.0	.11106990	59.6	.09704413	14.3	.06220921	48.9
-4.0	.11552760	74.9	.11194460	21.7	.04556707	75.2
.0	.11694470	90.0	.11694470	30.0	.03730278	120.0
4.0	.11552760	105.1	.11194460	38.3	.04556708	164.8
8.0	.11106990	120.4	.09704413	45.7	.06220921	191.1
12.0	.10341060	135.9	.07415133	52.1	.07622311	205.1
16.0	.09311727	150.8	.04830692	58.9	.08179650	212.6
20.0	.08148047	164.5	.02549598	70.5	.07859349	216.6
24.0	.06990122	176.5	.01065275	105.7	.06977464	218.7
28.0	.05935000	-173.2	.00986319	174.6	.05893521	219.7
32.0	.05025183	-164.5	.01426755	199.0	.04843702	220.1
36.0	.04264616	-157.2	.01686777	206.9	.03932988	220.1
40.0	.03638186	-151.0	.01777238	210.3	.03185154	219.9
44.0	.03124695	-145.8	.01762903	212.1	.02587051	219.6
48.0	.02703286	-141.4	.01691322	213.0	.02113778	219.3
52.0	.02355877	-137.6	.01592090	213.6	.01739986	218.9
56.0	.02067670	-134.2	.01482491	213.8	.01443865	218.6
60.0	.01826877	-131.3	.01372171	214.0	.01207928	218.2
64.0	.01624217	-128.8	.01266231	214.0	.01018601	217.9
68.0	.01452406	-126.5	.01167137	214.0	.00865495	217.5
72.0	.01305722	-124.5	.01075853	214.0	.00740701	217.2
76.0	.01179650	-122.7	.00992516	213.9	.00638187	217.0
80.0	.01070605	-121.1	.00916820	213.9	.00553335	216.7
84.0	.00975727	-119.6	.00848247	213.8	.00482593	216.4
88.0	.00892713	-118.3	.00786190	213.7	.00423209	216.2

92.0	.00819701	-117.1	.00730030	213.6	.00373033	216.0
96.0	.00755172	-115.9	.00679170	213.5	.00330377	215.7
100.0	.00697880	-114.9	.00633054	213.4	.00293904	215.6
104.0	.00646797	-113.9	.00591175	213.3	.00262548	215.4
108.0	.00601066	-113.1	.00553080	213.2	.00235453	215.2
112.0	.00559974	-112.2	.00518362	213.1	.00211926	215.0
116.0	.00522920	-111.5	.00486663	213.1	.00191406	214.9
120.0	.00489395	-110.7	.00457662	213.0	.00173430	214.7
124.0	.00458971	-110.1	.00431080	212.9	.00157620	214.6
128.0	.00431278	-109.5	.00406666	212.8	.00143661	214.5
132.0	.00406002	-108.9	.00384203	212.8	.00131293	214.3
136.0	.00382872	-108.3	.00363495	212.7	.00120296	214.2
140.0	.00361652	-107.8	.00344372	212.6	.00110486	214.1
144.0	.00342139	-107.3	.00326680	212.6	.00101710	214.0
148.0	.00324155	-106.8	.00310285	212.5	.00093834	213.9
152.0	.00307547	-106.4	.00295066	212.5	.00086747	213.8
156.0	.00292177	-106.0	.00280916	212.4	.00080353	213.7
160.0	.00277927	-105.6	.00267741	212.3	.00074570	213.6
164.0	.00264690	-105.2	.00255454	212.3	.00069326	213.5
168.0	.00252373	-104.8	.00243979	212.2	.00064561	213.5
172.0	.00240893	-104.5	.00233247	212.2	.00060221	213.4
176.0	.00230176	-104.1	.00223197	212.2	.00056260	213.3
180.0	.00220157	-103.8	.00213774	212.1	.00052639	213.2
184.0	.00210775	-103.5	.00204926	212.1	.00049320	213.2
188.0	.00201979	-103.2	.00196609	212.0	.00046274	213.1
192.0	.00193721	-103.0	.00188782	212.0	.00043473	213.0
196.0	.00185958	-102.7	.00181407	212.0	.00040892	213.0

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Attachment AA-2. Results of the Bonneville Power Administration Corona and Field Effects Program for the Southern Transmission Line

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Û      C O R O N A   A N D   F I E L D      Û
Û E F F E C T S   P R O G R A M   V E R.  3  Û
Û   Source: Bonneville Power Administration   Û
ÛÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÛ
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INPUT DATA LIST

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                 4/ 5/2023         20:39:18
SUNSTONE SOLAR T LINE SOUTHERN
RUN 3 2023040
1,0, 6, 6,0.0,   2.00,   1.00,1160.00

(ENGLISH UNITS OPTION)

(GRADIENTS ARE COMPUTED BY PROGRAM)

PHYSICAL SYSTEM CONSISTS OF  6 CONDUCTORS, OF WHICH  6 ARE ENERGIZED PHASES

OPTIONS: AN EF MF
  4.921,  6.562,  9.842,  1.000,  1.000, 75.000,  3.280,  6.700,  3.280
'A1      ','A',  -12.00,   66.75, 1,   1.504,    .000, 132.900,    .000,    .528,
 .000
'B1      ','A',  -12.00,   45.25, 1,   1.504,    .000, 132.900, 120.000,    .528,
 .000
'C1      ','A',  -12.00,   25.00, 1,   1.504,    .000, 132.900, 240.000,    .528,
 .000
'C2      ','A',   12.00,   25.00, 1,   1.504,    .000, 132.900, 240.000,    .528,
 .000
'A2      ','A',   12.00,   66.75, 1,   1.504,    .000, 132.900,    .000,    .528,
 .000
'B2      ','A',   12.00,   45.25, 1,   1.504,    .000, 132.900, 120.000,    .528,
 .000
100 -200.0    4.0
```

1AUDIBLE NOISE CALCULATION - RAIN

DIST FROM REFERENCE (FEET)	TOTALS L5 (DBA)	L50 (DBA)	A1	B1	C1	C2	A2	B2
-200.0	35.6	32.1	18.6	26.4	25.4	24.8	18.1	25.9
-196.0	35.7	32.2	18.7	26.5	25.5	24.9	18.1	25.9
-192.0	35.8	32.3	18.8	26.6	25.6	25.0	18.2	26.0
-188.0	35.9	32.4	18.9	26.7	25.8	25.1	18.3	26.1
-184.0	36.0	32.5	19.0	26.8	25.9	25.2	18.4	26.2
-180.0	36.1	32.6	19.1	27.0	26.0	25.3	18.5	26.3

-176.0	36.2	32.7	19.2	27.1	26.1	25.4	18.6	26.4
-172.0	36.3	32.8	19.3	27.2	26.2	25.5	18.7	26.5
-168.0	36.4	32.9	19.4	27.3	26.3	25.6	18.8	26.6
-164.0	36.5	33.0	19.5	27.4	26.5	25.8	18.9	26.7
-160.0	36.7	33.2	19.6	27.5	26.6	25.9	19.0	26.8
-156.0	36.8	33.3	19.8	27.7	26.7	26.0	19.1	27.0
-152.0	36.9	33.4	19.9	27.8	26.9	26.1	19.2	27.1
-148.0	37.0	33.5	20.0	27.9	27.0	26.2	19.3	27.2
-144.0	37.2	33.7	20.1	28.1	27.2	26.3	19.4	27.3
-140.0	37.3	33.8	20.2	28.2	27.3	26.5	19.5	27.4
-136.0	37.4	33.9	20.4	28.3	27.5	26.6	19.6	27.5
-132.0	37.6	34.1	20.5	28.5	27.6	26.7	19.8	27.7
-128.0	37.7	34.2	20.6	28.6	27.8	26.9	19.9	27.8
-124.0	37.9	34.4	20.8	28.8	28.0	27.0	20.0	27.9
-120.0	38.0	34.5	20.9	29.0	28.1	27.2	20.1	28.1
-116.0	38.2	34.7	21.0	29.1	28.3	27.3	20.2	28.2
-112.0	38.3	34.8	21.2	29.3	28.5	27.5	20.4	28.3
-108.0	38.5	35.0	21.3	29.5	28.7	27.6	20.5	28.5
-104.0	38.7	35.2	21.5	29.6	28.9	27.8	20.6	28.6
-100.0	38.8	35.3	21.6	29.8	29.1	28.0	20.8	28.8
-96.0	39.0	35.5	21.8	30.0	29.3	28.1	20.9	29.0
-92.0	39.2	35.7	21.9	30.2	29.5	28.3	21.0	29.1
-88.0	39.4	35.9	22.1	30.4	29.8	28.5	21.2	29.3
-84.0	39.6	36.1	22.2	30.6	30.0	28.7	21.3	29.5
-80.0	39.8	36.3	22.4	30.8	30.3	28.9	21.5	29.6
-76.0	40.0	36.5	22.6	31.0	30.6	29.1	21.6	29.8
-72.0	40.3	36.8	22.7	31.3	30.9	29.3	21.8	30.0
-68.0	40.5	37.0	22.9	31.5	31.2	29.5	21.9	30.2
-64.0	40.8	37.3	23.0	31.7	31.5	29.8	22.1	30.4
-60.0	41.0	37.5	23.2	32.0	31.8	30.0	22.2	30.6
-56.0	41.3	37.8	23.3	32.2	32.2	30.3	22.4	30.8
-52.0	41.6	38.1	23.5	32.5	32.6	30.6	22.6	31.0
-48.0	41.8	38.3	23.6	32.7	33.0	30.9	22.7	31.3
-44.0	42.1	38.6	23.8	32.9	33.4	31.2	22.9	31.5
-40.0	42.5	39.0	23.9	33.2	33.9	31.5	23.0	31.7
-36.0	42.8	39.3	24.0	33.4	34.3	31.8	23.2	32.0
-32.0	43.1	39.6	24.1	33.6	34.8	32.2	23.3	32.2
-28.0	43.4	39.9	24.2	33.8	35.3	32.6	23.5	32.5
-24.0	43.8	40.3	24.3	33.9	35.8	33.0	23.6	32.7
-20.0	44.1	40.6	24.3	34.1	36.2	33.4	23.8	32.9
-16.0	44.3	40.8	24.3	34.1	36.4	33.9	23.9	33.2
-12.0	44.5	41.0	24.4	34.2	36.5	34.3	24.0	33.4
-8.0	44.6	41.1	24.3	34.1	36.4	34.8	24.1	33.6
-4.0	44.6	41.1	24.3	34.1	36.2	35.3	24.2	33.8
.0	44.7	41.2	24.3	33.9	35.8	35.8	24.3	33.9
4.0	44.6	41.1	24.2	33.8	35.3	36.2	24.3	34.1
8.0	44.6	41.1	24.1	33.6	34.8	36.4	24.3	34.1
12.0	44.5	41.0	24.0	33.4	34.3	36.5	24.4	34.2
16.0	44.3	40.8	23.9	33.2	33.9	36.4	24.3	34.1
20.0	44.1	40.6	23.8	32.9	33.4	36.2	24.3	34.1

24.0	43.8	40.3	23.6	32.7	33.0	35.8	24.3	33.9
28.0	43.4	39.9	23.5	32.5	32.6	35.3	24.2	33.8
32.0	43.1	39.6	23.3	32.2	32.2	34.8	24.1	33.6
36.0	42.8	39.3	23.2	32.0	31.8	34.3	24.0	33.4
40.0	42.5	39.0	23.0	31.7	31.5	33.9	23.9	33.2
44.0	42.1	38.6	22.9	31.5	31.2	33.4	23.8	32.9
48.0	41.8	38.3	22.7	31.3	30.9	33.0	23.6	32.7
52.0	41.6	38.1	22.6	31.0	30.6	32.6	23.5	32.5
56.0	41.3	37.8	22.4	30.8	30.3	32.2	23.3	32.2
60.0	41.0	37.5	22.2	30.6	30.0	31.8	23.2	32.0
64.0	40.8	37.3	22.1	30.4	29.8	31.5	23.0	31.7
68.0	40.5	37.0	21.9	30.2	29.5	31.2	22.9	31.5
72.0	40.3	36.8	21.8	30.0	29.3	30.9	22.7	31.3
76.0	40.0	36.5	21.6	29.8	29.1	30.6	22.6	31.0
80.0	39.8	36.3	21.5	29.6	28.9	30.3	22.4	30.8
84.0	39.6	36.1	21.3	29.5	28.7	30.0	22.2	30.6
88.0	39.4	35.9	21.2	29.3	28.5	29.8	22.1	30.4
92.0	39.2	35.7	21.0	29.1	28.3	29.5	21.9	30.2
96.0	39.0	35.5	20.9	29.0	28.1	29.3	21.8	30.0
100.0	38.8	35.3	20.8	28.8	28.0	29.1	21.6	29.8
104.0	38.7	35.2	20.6	28.6	27.8	28.9	21.5	29.6
108.0	38.5	35.0	20.5	28.5	27.6	28.7	21.3	29.5
112.0	38.3	34.8	20.4	28.3	27.5	28.5	21.2	29.3
116.0	38.2	34.7	20.2	28.2	27.3	28.3	21.0	29.1
120.0	38.0	34.5	20.1	28.1	27.2	28.1	20.9	29.0
124.0	37.9	34.4	20.0	27.9	27.0	28.0	20.8	28.8
128.0	37.7	34.2	19.9	27.8	26.9	27.8	20.6	28.6
132.0	37.6	34.1	19.8	27.7	26.7	27.6	20.5	28.5
136.0	37.4	33.9	19.6	27.5	26.6	27.5	20.4	28.3
140.0	37.3	33.8	19.5	27.4	26.5	27.3	20.2	28.2
144.0	37.2	33.7	19.4	27.3	26.3	27.2	20.1	28.1
148.0	37.0	33.5	19.3	27.2	26.2	27.0	20.0	27.9
152.0	36.9	33.4	19.2	27.1	26.1	26.9	19.9	27.8
156.0	36.8	33.3	19.1	27.0	26.0	26.7	19.8	27.7
160.0	36.7	33.2	19.0	26.8	25.9	26.6	19.6	27.5
164.0	36.5	33.0	18.9	26.7	25.8	26.5	19.5	27.4
168.0	36.4	32.9	18.8	26.6	25.6	26.3	19.4	27.3
172.0	36.3	32.8	18.7	26.5	25.5	26.2	19.3	27.2
176.0	36.2	32.7	18.6	26.4	25.4	26.1	19.2	27.1
180.0	36.1	32.6	18.5	26.3	25.3	26.0	19.1	27.0
184.0	36.0	32.5	18.4	26.2	25.2	25.9	19.0	26.8
188.0	35.9	32.4	18.3	26.1	25.1	25.8	18.9	26.7
192.0	35.8	32.3	18.2	26.0	25.0	25.6	18.8	26.6
196.0	35.7	32.2	18.1	25.9	24.9	25.5	18.7	26.5

1AUDIBLE NOISE CALCULATION - FAIR

DIST FROM REFERENCE (FEET)	TOTALS L5 (DBA)	L50 (DBA)	A1	B1	C1	C2	A2	B2

-200.0	10.6	7.1	-6.4	1.4	.4	-.2	-6.9	.9
-196.0	10.7	7.2	-6.3	1.5	.5	-.1	-6.9	.9
-192.0	10.8	7.3	-6.2	1.6	.6	.0	-6.8	1.0
-188.0	10.9	7.4	-6.1	1.7	.8	.1	-6.7	1.1
-184.0	11.0	7.5	-6.0	1.8	.9	.2	-6.6	1.2
-180.0	11.1	7.6	-5.9	2.0	1.0	.3	-6.5	1.3
-176.0	11.2	7.7	-5.8	2.1	1.1	.4	-6.4	1.4
-172.0	11.3	7.8	-5.7	2.2	1.2	.5	-6.3	1.5
-168.0	11.4	7.9	-5.6	2.3	1.3	.6	-6.2	1.6
-164.0	11.5	8.0	-5.5	2.4	1.5	.8	-6.1	1.7
-160.0	11.7	8.2	-5.4	2.5	1.6	.9	-6.0	1.8
-156.0	11.8	8.3	-5.2	2.7	1.7	1.0	-5.9	2.0
-152.0	11.9	8.4	-5.1	2.8	1.9	1.1	-5.8	2.1
-148.0	12.0	8.5	-5.0	2.9	2.0	1.2	-5.7	2.2
-144.0	12.2	8.7	-4.9	3.1	2.2	1.3	-5.6	2.3
-140.0	12.3	8.8	-4.8	3.2	2.3	1.5	-5.5	2.4
-136.0	12.4	8.9	-4.6	3.3	2.5	1.6	-5.4	2.5
-132.0	12.6	9.1	-4.5	3.5	2.6	1.7	-5.2	2.7
-128.0	12.7	9.2	-4.4	3.6	2.8	1.9	-5.1	2.8
-124.0	12.9	9.4	-4.2	3.8	3.0	2.0	-5.0	2.9
-120.0	13.0	9.5	-4.1	4.0	3.1	2.2	-4.9	3.1
-116.0	13.2	9.7	-4.0	4.1	3.3	2.3	-4.8	3.2
-112.0	13.3	9.8	-3.8	4.3	3.5	2.5	-4.6	3.3
-108.0	13.5	10.0	-3.7	4.5	3.7	2.6	-4.5	3.5
-104.0	13.7	10.2	-3.5	4.6	3.9	2.8	-4.4	3.6
-100.0	13.8	10.3	-3.4	4.8	4.1	3.0	-4.2	3.8
-96.0	14.0	10.5	-3.2	5.0	4.3	3.1	-4.1	4.0
-92.0	14.2	10.7	-3.1	5.2	4.5	3.3	-4.0	4.1
-88.0	14.4	10.9	-2.9	5.4	4.8	3.5	-3.8	4.3
-84.0	14.6	11.1	-2.8	5.6	5.0	3.7	-3.7	4.5
-80.0	14.8	11.3	-2.6	5.8	5.3	3.9	-3.5	4.6
-76.0	15.0	11.5	-2.4	6.0	5.6	4.1	-3.4	4.8
-72.0	15.3	11.8	-2.3	6.3	5.9	4.3	-3.2	5.0
-68.0	15.5	12.0	-2.1	6.5	6.2	4.5	-3.1	5.2
-64.0	15.8	12.3	-2.0	6.7	6.5	4.8	-2.9	5.4
-60.0	16.0	12.5	-1.8	7.0	6.8	5.0	-2.8	5.6
-56.0	16.3	12.8	-1.7	7.2	7.2	5.3	-2.6	5.8
-52.0	16.6	13.1	-1.5	7.5	7.6	5.6	-2.4	6.0
-48.0	16.8	13.3	-1.4	7.7	8.0	5.9	-2.3	6.3
-44.0	17.1	13.6	-1.2	7.9	8.4	6.2	-2.1	6.5
-40.0	17.5	14.0	-1.1	8.2	8.9	6.5	-2.0	6.7
-36.0	17.8	14.3	-1.0	8.4	9.3	6.8	-1.8	7.0
-32.0	18.1	14.6	-.9	8.6	9.8	7.2	-1.7	7.2
-28.0	18.4	14.9	-.8	8.8	10.3	7.6	-1.5	7.5
-24.0	18.8	15.3	-.7	8.9	10.8	8.0	-1.4	7.7
-20.0	19.1	15.6	-.7	9.1	11.2	8.4	-1.2	7.9
-16.0	19.3	15.8	-.7	9.1	11.4	8.9	-1.1	8.2
-12.0	19.5	16.0	-.6	9.2	11.5	9.3	-1.0	8.4

-8.0	19.6	16.1	-.7	9.1	11.4	9.8	-.9	8.6
-4.0	19.6	16.1	-.7	9.1	11.2	10.3	-.8	8.8
.0	19.7	16.2	-.7	8.9	10.8	10.8	-.7	8.9
4.0	19.6	16.1	-.8	8.8	10.3	11.2	-.7	9.1
8.0	19.6	16.1	-.9	8.6	9.8	11.4	-.7	9.1
12.0	19.5	16.0	-1.0	8.4	9.3	11.5	-.6	9.2
16.0	19.3	15.8	-1.1	8.2	8.9	11.4	-.7	9.1
20.0	19.1	15.6	-1.2	7.9	8.4	11.2	-.7	9.1
24.0	18.8	15.3	-1.4	7.7	8.0	10.8	-.7	8.9
28.0	18.4	14.9	-1.5	7.5	7.6	10.3	-.8	8.8
32.0	18.1	14.6	-1.7	7.2	7.2	9.8	-.9	8.6
36.0	17.8	14.3	-1.8	7.0	6.8	9.3	-1.0	8.4
40.0	17.5	14.0	-2.0	6.7	6.5	8.9	-1.1	8.2
44.0	17.1	13.6	-2.1	6.5	6.2	8.4	-1.2	7.9
48.0	16.8	13.3	-2.3	6.3	5.9	8.0	-1.4	7.7
52.0	16.6	13.1	-2.4	6.0	5.6	7.6	-1.5	7.5
56.0	16.3	12.8	-2.6	5.8	5.3	7.2	-1.7	7.2
60.0	16.0	12.5	-2.8	5.6	5.0	6.8	-1.8	7.0
64.0	15.8	12.3	-2.9	5.4	4.8	6.5	-2.0	6.7
68.0	15.5	12.0	-3.1	5.2	4.5	6.2	-2.1	6.5
72.0	15.3	11.8	-3.2	5.0	4.3	5.9	-2.3	6.3
76.0	15.0	11.5	-3.4	4.8	4.1	5.6	-2.4	6.0
80.0	14.8	11.3	-3.5	4.6	3.9	5.3	-2.6	5.8
84.0	14.6	11.1	-3.7	4.5	3.7	5.0	-2.8	5.6
88.0	14.4	10.9	-3.8	4.3	3.5	4.8	-2.9	5.4
92.0	14.2	10.7	-4.0	4.1	3.3	4.5	-3.1	5.2
96.0	14.0	10.5	-4.1	4.0	3.1	4.3	-3.2	5.0
100.0	13.8	10.3	-4.2	3.8	3.0	4.1	-3.4	4.8
104.0	13.7	10.2	-4.4	3.6	2.8	3.9	-3.5	4.6
108.0	13.5	10.0	-4.5	3.5	2.6	3.7	-3.7	4.5
112.0	13.3	9.8	-4.6	3.3	2.5	3.5	-3.8	4.3
116.0	13.2	9.7	-4.8	3.2	2.3	3.3	-4.0	4.1
120.0	13.0	9.5	-4.9	3.1	2.2	3.1	-4.1	4.0
124.0	12.9	9.4	-5.0	2.9	2.0	3.0	-4.2	3.8
128.0	12.7	9.2	-5.1	2.8	1.9	2.8	-4.4	3.6
132.0	12.6	9.1	-5.2	2.7	1.7	2.6	-4.5	3.5
136.0	12.4	8.9	-5.4	2.5	1.6	2.5	-4.6	3.3
140.0	12.3	8.8	-5.5	2.4	1.5	2.3	-4.8	3.2
144.0	12.2	8.7	-5.6	2.3	1.3	2.2	-4.9	3.1
148.0	12.0	8.5	-5.7	2.2	1.2	2.0	-5.0	2.9
152.0	11.9	8.4	-5.8	2.1	1.1	1.9	-5.1	2.8
156.0	11.8	8.3	-5.9	2.0	1.0	1.7	-5.2	2.7
160.0	11.7	8.2	-6.0	1.8	.9	1.6	-5.4	2.5
164.0	11.5	8.0	-6.1	1.7	.8	1.5	-5.5	2.4
168.0	11.4	7.9	-6.2	1.6	.6	1.3	-5.6	2.3
172.0	11.3	7.8	-6.3	1.5	.5	1.2	-5.7	2.2
176.0	11.2	7.7	-6.4	1.4	.4	1.1	-5.8	2.1
180.0	11.1	7.6	-6.5	1.3	.3	1.0	-5.9	2.0
184.0	11.0	7.5	-6.6	1.2	.2	.9	-6.0	1.8
188.0	10.9	7.4	-6.7	1.1	.1	.8	-6.1	1.7

192.0	10.8	7.3	-6.8	1.0	.0	.6	-6.2	1.6
196.0	10.7	7.2	-6.9	.9	-.1	.5	-6.3	1.5

1ELECTRIC FIELD CALCULATIONS

SUNSTONE SOLAR T LINE SOUTHERN
RUN 3 2023040

	DIST. FROM REFERENCE FEET	HEIGHT FEET	MAXIMUM GRADIENT (KV/CM)	SUBCON. DIAM. (IN)	NO. OF SUBCON.	PHASE ANGLE (DEGREES)
A1	-12.00	66.75	10.21	1.50	1	.0
B1	-12.00	45.25	11.84	1.50	1	120.0
C1	-12.00	25.00	11.60	1.50	1	240.0
C2	12.00	25.00	11.60	1.50	1	240.0
A2	12.00	66.75	10.21	1.50	1	.0
B2	12.00	45.25	11.84	1.50	1	120.0

SENSOR HT. = 3.3 FEET

DIST FROM REFERENCE FEET	E-FIELD (KV/METER)	THETA (DEGREES)	EY-FIELD (KV/METER)	THETAY (DEGREES)	EX-FIELD (KV/METER)	THETAX (DEGREES)	SPACE POTENTIAL (VOLTS)
-200.0	.147	88.5	.147	-158.8	.004	-156.0	147.4
-196.0	.152	88.5	.152	-158.7	.004	-155.8	152.2
-192.0	.157	88.5	.157	-158.6	.004	-155.5	157.3
-188.0	.163	88.4	.163	-158.5	.004	-155.2	162.6
-184.0	.168	88.4	.168	-158.4	.005	-154.9	168.1
-180.0	.174	88.4	.174	-158.3	.005	-154.6	173.9
-176.0	.180	88.4	.180	-158.2	.005	-154.3	179.9
-172.0	.186	88.4	.186	-158.0	.005	-153.9	186.1
-168.0	.193	88.4	.193	-157.9	.005	-153.5	192.7
-164.0	.200	88.4	.199	-157.7	.006	-153.0	199.4
-160.0	.207	88.4	.206	-157.6	.006	-152.5	206.5
-156.0	.214	88.4	.214	-157.4	.006	-151.9	213.8

-152.0	.222	88.4	.221	-157.2	.006	-151.3	221.4
-148.0	.229	88.4	.229	-157.0	.007	-150.6	229.3
-144.0	.237	88.4	.237	-156.7	.007	-149.8	237.4
-140.0	.246	88.4	.246	-156.5	.007	-148.8	245.7
-136.0	.254	88.4	.254	-156.2	.007	-147.8	254.3
-132.0	.263	88.4	.263	-155.9	.007	-146.5	263.0
-128.0	.272	88.5	.272	-155.6	.007	-145.1	271.8
-124.0	.281	88.5	.281	-155.2	.007	-143.3	280.6
-120.0	.290	88.6	.289	-154.8	.007	-141.1	289.4
-116.0	.298	88.7	.298	-154.4	.007	-138.3	297.9
-112.0	.306	88.8	.306	-153.9	.007	-134.6	306.1
-108.0	.314	88.9	.314	-153.3	.006	-129.5	313.7
-104.0	.321	89.1	.321	-152.7	.006	-122.0	320.4
-100.0	.326	89.3	.326	-152.0	.005	-109.9	325.9
-96.0	.330	89.6	.330	-151.2	.005	-89.7	329.6
-92.0	.332	90.0	.332	-150.3	.005	-59.4	330.9
-88.0	.330	90.5	.330	-149.3	.006	-29.8	329.1
-84.0	.325	91.2	.324	-148.0	.009	-10.3	323.1
-80.0	.314	92.2	.313	-146.5	.014	1.7	311.6
-76.0	.296	93.6	.295	-144.7	.021	9.6	293.1
-72.0	.270	95.8	.268	-142.2	.029	15.5	265.3
-68.0	.233	99.5	.229	-138.5	.041	20.3	225.6
-64.0	.184	106.5	.176	-132.3	.056	24.4	171.4
-60.0	.126	123.0	.108	-116.6	.075	28.1	101.9
-56.0	.102	11.6	.062	-45.9	.101	31.6	62.5

-52.0	.206	51.3	.163	11.1	.133	35.1	171.6
-48.0	.380	63.1	.339	24.6	.175	38.4	350.8
-44.0	.618	68.6	.575	30.8	.228	41.5	590.5
-40.0	.930	71.8	.884	35.1	.293	44.6	902.6
-36.0	1.332	74.0	1.280	38.4	.370	47.3	1301.1
-32.0	1.832	75.8	1.776	41.2	.453	49.7	1797.1
-28.0	2.432	77.6	2.375	43.6	.528	51.7	2390.7
-24.0	3.109	79.5	3.056	45.6	.572	53.0	3059.8
-20.0	3.805	81.7	3.765	47.1	.554	53.5	3748.4
-16.0	4.430	84.1	4.406	48.1	.459	53.0	4370.2
-12.0	4.893	86.4	4.883	48.5	.307	50.7	4838.9
-8.0	5.157	88.3	5.155	48.4	.157	45.3	5118.3
-4.0	5.264	89.4	5.263	48.2	.056	36.4	5241.6
.0	5.287	90.0	5.287	48.1	.000	67.6	5272.4
4.0	5.264	90.6	5.263	48.2	.056	-143.6	5241.6
8.0	5.157	91.7	5.155	48.4	.157	-134.7	5118.3
12.0	4.893	93.6	4.883	48.5	.307	-129.3	4838.9
16.0	4.430	95.9	4.406	48.1	.459	-127.0	4370.2
20.0	3.805	98.3	3.765	47.1	.554	-126.5	3748.4
24.0	3.109	100.5	3.056	45.6	.572	-127.0	3059.8
28.0	2.432	102.4	2.375	43.6	.528	-128.3	2390.7
32.0	1.832	104.2	1.776	41.2	.453	-130.3	1797.1
36.0	1.332	106.0	1.280	38.4	.370	-132.7	1301.1
40.0	.930	108.2	.884	35.1	.293	-135.4	902.6
44.0	.618	111.4	.575	30.8	.228	-138.5	590.5

48.0	.380	116.9	.339	24.6	.175	-141.6	350.8
52.0	.206	128.7	.163	11.1	.133	-144.9	171.6
56.0	.102	168.4	.062	-45.9	.101	-148.4	62.5
60.0	.126	57.0	.108	-116.6	.075	-151.9	101.9
64.0	.184	73.5	.176	-132.3	.056	-155.6	171.4
68.0	.233	80.5	.229	-138.5	.041	-159.7	225.6
72.0	.270	84.2	.268	-142.2	.029	-164.5	265.3
76.0	.296	86.4	.295	-144.7	.021	-170.4	293.1
80.0	.314	87.8	.313	-146.5	.014	-178.3	311.6
84.0	.325	88.8	.324	-148.0	.009	169.7	323.1
88.0	.330	89.5	.330	-149.3	.006	150.2	329.1
92.0	.332	90.0	.332	-150.3	.005	120.6	330.9
96.0	.330	90.4	.330	-151.2	.005	90.3	329.6
100.0	.326	90.7	.326	-152.0	.005	70.1	325.9
104.0	.321	90.9	.321	-152.7	.006	58.0	320.4
108.0	.314	91.1	.314	-153.3	.006	50.5	313.7
112.0	.306	91.2	.306	-153.9	.007	45.4	306.1
116.0	.298	91.3	.298	-154.4	.007	41.7	297.9
120.0	.290	91.4	.289	-154.8	.007	38.9	289.4
124.0	.281	91.5	.281	-155.2	.007	36.7	280.6
128.0	.272	91.5	.272	-155.6	.007	34.9	271.8
132.0	.263	91.6	.263	-155.9	.007	33.5	263.0
136.0	.254	91.6	.254	-156.2	.007	32.2	254.3
140.0	.246	91.6	.246	-156.5	.007	31.2	245.7
144.0	.237	91.6	.237	-156.7	.007	30.2	237.4

148.0	.229	91.6	.229	-157.0	.007	29.4	229.3
152.0	.222	91.6	.221	-157.2	.006	28.7	221.4
156.0	.214	91.6	.214	-157.4	.006	28.1	213.8
160.0	.207	91.6	.206	-157.6	.006	27.5	206.5
164.0	.200	91.6	.199	-157.7	.006	27.0	199.4
168.0	.193	91.6	.193	-157.9	.005	26.5	192.7
172.0	.186	91.6	.186	-158.0	.005	26.1	186.1
176.0	.180	91.6	.180	-158.2	.005	25.7	179.9
180.0	.174	91.6	.174	-158.3	.005	25.4	173.9
184.0	.168	91.6	.168	-158.4	.005	25.1	168.1
188.0	.163	91.6	.163	-158.5	.004	24.8	162.6
192.0	.157	91.5	.157	-158.6	.004	24.5	157.3
196.0	.152	91.5	.152	-158.7	.004	24.2	152.2

1MAGNETIC FIELD CALCULATIONS

SENSOR HT. = 3.3 FEET

DIST FROM REFERENCE FEET	B-FIELD (GAUSS)	THETA	BY-FIELD (GAUSS)	THETAY	BX-FIELD (GAUSS)	THETAX
-200.0	.00599039	24.1	.00246211	22.3	.00547213	31.2
-196.0	.00622617	24.5	.00260620	22.4	.00566649	31.3
-192.0	.00647592	25.0	.00276153	22.4	.00587064	31.4
-188.0	.00674073	25.5	.00292921	22.5	.00608518	31.5
-184.0	.00702182	26.1	.00311047	22.5	.00631074	31.6
-180.0	.00732053	26.6	.00330666	22.6	.00654799	31.7
-176.0	.00763832	27.2	.00351934	22.7	.00679763	31.9
-172.0	.00797684	27.8	.00375021	22.8	.00706042	32.0
-168.0	.00833786	28.4	.00400121	22.8	.00733714	32.1
-164.0	.00872340	29.1	.00427454	22.9	.00762861	32.3
-160.0	.00913566	29.8	.00457264	23.0	.00793566	32.4
-156.0	.00957710	30.5	.00489830	23.1	.00825919	32.6
-152.0	.01005048	31.3	.00525467	23.2	.00860009	32.8
-148.0	.01055884	32.1	.00564533	23.4	.00895923	33.0

-144.0	.01110564	32.9	.00607434	23.5	.00933753	33.3
-140.0	.01169470	33.8	.00654635	23.6	.00973581	33.5
-136.0	.01233036	34.7	.00706665	23.8	.01015486	33.8
-132.0	.01301747	35.7	.00764128	23.9	.01059535	34.1
-128.0	.01376154	36.7	.00827716	24.1	.01105778	34.4
-124.0	.01456879	37.8	.00898227	24.3	.01154240	34.7
-120.0	.01544626	38.9	.00976573	24.5	.01204913	35.1
-116.0	.01640198	40.1	.01063807	24.8	.01257739	35.5
-112.0	.01744506	41.4	.01161143	25.0	.01312595	36.0
-108.0	.01858595	42.8	.01269980	25.3	.01369271	36.5
-104.0	.01983659	44.3	.01391934	25.6	.01427434	37.1
-100.0	.02121069	45.8	.01528873	25.9	.01486595	37.8
-96.0	.02272404	47.5	.01682954	26.3	.01546049	38.5
-92.0	.02439482	49.3	.01856666	26.7	.01604809	39.4
-88.0	.02624409	51.2	.02052875	27.2	.01661513	40.4
-84.0	.02829621	53.2	.02274874	27.7	.01714302	41.5
-80.0	.03057946	55.4	.02526423	28.3	.01760659	42.8
-76.0	.03312670	57.8	.02811782	29.0	.01797208	44.3
-72.0	.03597614	60.4	.03135722	29.7	.01819441	46.1
-68.0	.03917212	63.2	.03503481	30.5	.01821392	48.3
-64.0	.04276601	66.2	.03920624	31.4	.01795267	51.0
-60.0	.04681684	69.6	.04392745	32.4	.01731126	54.6
-56.0	.05139160	73.2	.04924844	33.5	.01617023	59.4
-52.0	.05656430	77.3	.05520165	34.8	.01441076	66.7
-48.0	.06241285	81.8	.06178079	36.1	.01201819	79.2
-44.0	.06901100	86.8	.06890319	37.5	.00957235	104.0
-40.0	.07641131	92.4	.07634597	39.0	.00982128	147.7
-36.0	.08461159	98.7	.08364432	40.6	.01599064	183.0
-32.0	.09349503	105.9	.08994961	42.0	.02727258	200.4
-28.0	.10273580	114.1	.09388666	43.3	.04272118	209.6
-24.0	.11168470	123.2	.09356058	44.3	.06154063	215.1
-20.0	.11931810	133.2	.08702945	44.8	.08188894	218.5
-16.0	.12443930	143.8	.07350489	44.8	.10050940	220.4
-12.0	.12629880	154.4	.05468939	43.9	.11386800	221.2
-8.0	.12535970	164.1	.03444789	42.4	.12053600	221.1
-4.0	.12338940	172.5	.01610624	40.8	.12233370	220.7
.0	.12243330	-180.0	.00000000	256.6	.12243330	220.5
4.0	.12338940	-172.5	.01610624	220.8	.12233370	220.7
8.0	.12535970	-164.1	.03444789	222.4	.12053600	221.1
12.0	.12629880	-154.4	.05468939	223.9	.11386800	221.2
16.0	.12443930	-143.8	.07350488	224.8	.10050940	220.4
20.0	.11931810	-133.2	.08702945	224.8	.08188894	218.5
24.0	.11168470	-123.2	.09356058	224.3	.06154062	215.1
28.0	.10273580	-114.1	.09388665	223.3	.04272119	209.6
32.0	.09349503	-105.9	.08994961	222.0	.02727258	200.4
36.0	.08461159	-98.7	.08364433	220.6	.01599065	183.0
40.0	.07641131	-92.4	.07634597	219.0	.00982128	147.7
44.0	.06901101	-86.8	.06890319	217.5	.00957235	104.0
48.0	.06241285	-81.8	.06178079	216.1	.01201818	79.2
52.0	.05656430	-77.3	.05520165	214.8	.01441076	66.7

56.0	.05139160	-73.2	.04924844	213.5	.01617023	59.4
60.0	.04681685	-69.6	.04392745	212.4	.01731126	54.6
64.0	.04276601	-66.2	.03920624	211.4	.01795267	51.0
68.0	.03917212	-63.2	.03503481	210.5	.01821392	48.3
72.0	.03597614	-60.4	.03135723	209.7	.01819441	46.1
76.0	.03312671	-57.8	.02811782	209.0	.01797208	44.3
80.0	.03057946	-55.4	.02526423	208.3	.01760659	42.8
84.0	.02829621	-53.2	.02274874	207.7	.01714302	41.5
88.0	.02624409	-51.2	.02052875	207.2	.01661513	40.4
92.0	.02439483	-49.3	.01856666	206.7	.01604809	39.4
96.0	.02272404	-47.5	.01682954	206.3	.01546049	38.5
100.0	.02121069	-45.8	.01528873	205.9	.01486595	37.8
104.0	.01983659	-44.3	.01391934	205.6	.01427434	37.1
108.0	.01858595	-42.8	.01269980	205.3	.01369271	36.5
112.0	.01744506	-41.4	.01161143	205.0	.01312595	36.0
116.0	.01640198	-40.1	.01063808	204.8	.01257739	35.5
120.0	.01544626	-38.9	.00976573	204.5	.01204913	35.1
124.0	.01456879	-37.8	.00898227	204.3	.01154240	34.7
128.0	.01376154	-36.7	.00827716	204.1	.01105778	34.4
132.0	.01301747	-35.7	.00764128	203.9	.01059535	34.1
136.0	.01233036	-34.7	.00706665	203.8	.01015486	33.8
140.0	.01169470	-33.8	.00654635	203.6	.00973581	33.5
144.0	.01110564	-32.9	.00607434	203.5	.00933753	33.3
148.0	.01055885	-32.1	.00564533	203.4	.00895923	33.0
152.0	.01005048	-31.3	.00525467	203.2	.00860009	32.8
156.0	.00957710	-30.5	.00489830	203.1	.00825919	32.6
160.0	.00913566	-29.8	.00457264	203.0	.00793566	32.4
164.0	.00872340	-29.1	.00427454	202.9	.00762861	32.3
168.0	.00833786	-28.4	.00400122	202.8	.00733714	32.1
172.0	.00797684	-27.8	.00375021	202.8	.00706042	32.0
176.0	.00763832	-27.2	.00351934	202.7	.00679763	31.9
180.0	.00732053	-26.6	.00330666	202.6	.00654799	31.7
184.0	.00702182	-26.1	.00311047	202.5	.00631074	31.6
188.0	.00674073	-25.5	.00292921	202.5	.00608518	31.5
192.0	.00647592	-25.0	.00276153	202.4	.00587064	31.4
196.0	.00622617	-24.5	.00260620	202.4	.00566649	31.3

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Attachment AA-3. Results of the Bonneville Power Administration Corona and Field Effects Program for the Parallel Transmission Lines

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     ÛßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßßÛ
     Û       C O R O N A   A N D   F I E L D      Û
     Û E F F E C T S   P R O G R A M   V E R.  3   Û
     Û   Source: Bonneville Power Administration   Û
     ÛÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÜÛ
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INPUT DATA LIST

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                  6/ 1/2023         15:49:51
  SUNSTONE SOLAR T LINE PARALLEL
  RUN 2 20230601
 1,0, 9, 9,0.0,   2.00,   1.00,1160.00

 (ENGLISH UNITS OPTION)

 (GRADIENTS ARE COMPUTED BY PROGRAM)

 PHYSICAL SYSTEM CONSISTS OF  9 CONDUCTORS, OF WHICH  9 ARE ENERGIZED PHASES

 OPTIONS:  AN EF MF
   4.921,  6.562,  9.842,  1.000,  1.000, 75.000,  3.280,  6.700,  3.280
 'A1S     ','A',  -10.50,   66.75, 1,   1.504,    .000, 132.900,    .000,    .528,
  .000
 'B1S     ','A',  -10.50,   45.25, 1,   1.504,    .000, 132.900, 120.000,    .528,
  .000
 'C1S     ','A',  -10.50,   25.00, 1,   1.504,    .000, 132.900, 240.000,    .528,
  .000
 'C2S     ','A',  -34.50,   25.00, 1,   1.504,    .000, 132.900, 240.000,    .528,
  .000
 'A2S     ','A',  -34.50,   66.75, 1,   1.504,    .000, 132.900,    .000,    .528,
  .000
 'B2S     ','A',  -34.50,   45.25, 1,   1.504,    .000, 132.900, 120.000,    .528,
  .000
 'A1N     ','A',   34.50,   25.00, 1,   1.504,    .000, 132.900,    .000,    .528,
  .000
 'B1N     ','A',   22.50,   25.00, 1,   1.504,    .000, 132.900, 120.000,    .528,
  .000
 'C1N     ','A',   10.50,   25.00, 1,   1.504,    .000, 132.900, 240.000,    .528,
  .000
 100 -300.0    6.0
1AUDIBLE NOISE CALCULATION - RAIN


 DIST FROM    TOTALS
 REFERENCE    L5       L50    A1S      B1S      C1S      C2S      A2S      B2S
A1N      B1N      C1N
  (FEET)     (DBA)    (DBA)
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-300.0	38.3	34.8	16.7	24.8	20.0	23.2	17.1	24.9	26.3	30.6	26.1
-294.0	38.4	34.9	16.8	24.9	20.1	23.3	17.2	25.0	26.4	30.7	26.2
-288.0	38.5	35.0	16.9	25.0	20.2	23.4	17.3	25.1	26.5	30.8	26.3
-282.0	38.6	35.1	17.0	25.1	20.3	23.5	17.4	25.2	26.6	30.9	26.4
-276.0	38.7	35.2	17.1	25.2	20.4	23.7	17.5	25.4	26.6	31.0	26.5
-270.0	38.8	35.3	17.2	25.3	20.6	23.8	17.6	25.5	26.7	31.1	26.6
-264.0	38.9	35.4	17.4	25.4	20.7	23.9	17.7	25.6	26.8	31.2	26.7
-258.0	39.0	35.5	17.5	25.5	20.8	24.0	17.9	25.7	26.9	31.3	26.8
-252.0	39.1	35.6	17.6	25.7	20.9	24.2	18.0	25.9	27.0	31.4	26.9
-246.0	39.2	35.7	17.7	25.8	21.0	24.3	18.1	26.0	27.1	31.5	27.1
-240.0	39.4	35.9	17.8	25.9	21.2	24.5	18.2	26.1	27.3	31.6	27.2
-234.0	39.5	36.0	17.9	26.0	21.3	24.6	18.4	26.3	27.4	31.8	27.3
-228.0	39.6	36.1	18.1	26.2	21.4	24.8	18.5	26.4	27.5	31.9	27.4
-222.0	39.7	36.2	18.2	26.3	21.6	24.9	18.7	26.6	27.6	32.0	27.5
-216.0	39.9	36.4	18.3	26.4	21.7	25.1	18.8	26.7	27.7	32.1	27.7
-210.0	40.0	36.5	18.5	26.6	21.8	25.2	19.0	26.9	27.8	32.2	27.8
-204.0	40.1	36.6	18.6	26.7	22.0	25.4	19.1	27.1	27.9	32.4	27.9
-198.0	40.3	36.8	18.7	26.9	22.2	25.6	19.3	27.2	28.1	32.5	28.1
-192.0	40.4	36.9	18.9	27.0	22.3	25.8	19.4	27.4	28.2	32.6	28.2
-186.0	40.6	37.1	19.0	27.2	22.5	25.9	19.6	27.6	28.3	32.8	28.4
-180.0	40.7	37.2	19.2	27.3	22.6	26.1	19.8	27.8	28.5	32.9	28.5
-174.0	40.9	37.4	19.3	27.5	22.8	26.3	19.9	28.0	28.6	33.1	28.7
-168.0	41.1	37.6	19.5	27.7	23.0	26.6	20.1	28.2	28.7	33.2	28.8
-162.0	41.2	37.7	19.7	27.9	23.2	26.8	20.3	28.4	28.9	33.4	29.0
-156.0	41.4	37.9	19.8	28.1	23.4	27.0	20.5	28.6			

```
29.0     33.5     29.2
 -150.0     41.6     38.1     20.0     28.2     23.6     27.3     20.7     28.8
29.2     33.7     29.4
 -144.0     41.8     38.3     20.2     28.4     23.8     27.5     20.9     29.0
29.4     33.9     29.5
 -138.0     42.0     38.5     20.4     28.7     24.0     27.8     21.1     29.3
29.5     34.1     29.7
 -132.0     42.2     38.7     20.6     28.9     24.3     28.1     21.3     29.5
29.7     34.2     29.9
 -126.0     42.4     38.9     20.8     29.1     24.5     28.4     21.5     29.8
29.9     34.4     30.1
 -120.0     42.6     39.1     21.0     29.3     24.8     28.7     21.8     30.1
30.1     34.6     30.4
 -114.0     42.9     39.4     21.2     29.6     25.0     29.0     22.0     30.4
30.3     34.8     30.6
 -108.0     43.1     39.6     21.4     29.8     25.3     29.4     22.2     30.7
30.5     35.1     30.8
 -102.0     43.4     39.9     21.6     30.1     25.6     29.8     22.5     31.0
30.7     35.3     31.1
  -96.0     43.7     40.2     21.8     30.4     25.9     30.2     22.7     31.3
30.9     35.5     31.3
  -90.0     44.0     40.5     22.1     30.7     26.3     30.7     22.9     31.7
31.1     35.8     31.6
  -84.0     44.3     40.8     22.3     31.0     26.6     31.2     23.2     32.0
31.4     36.0     31.9
  -78.0     44.6     41.1     22.5     31.3     27.0     31.7     23.4     32.4
31.6     36.3     32.2
  -72.0     44.9     41.4     22.8     31.6     27.4     32.3     23.6     32.8
31.9     36.6     32.5
  -66.0     45.3     41.8     23.0     32.0     27.9     32.9     23.8     33.1
32.1     36.9     32.9
  -60.0     45.7     42.2     23.3     32.3     28.4     33.6     24.0     33.5
32.4     37.2     33.3
  -54.0     46.1     42.6     23.5     32.7     28.9     34.4     24.2     33.8
32.7     37.6     33.7
  -48.0     46.5     43.0     23.7     33.0     29.5     35.1     24.3     34.0
33.1     38.0     34.1
  -42.0     46.9     43.4     23.9     33.4     30.2     35.7     24.4     34.2
33.4     38.4     34.6
  -36.0     47.3     43.8     24.1     33.8     30.9     36.0     24.4     34.3
33.8     38.8     35.1
  -30.0     47.6     44.1     24.3     34.1     31.6     35.9     24.4     34.3
34.2     39.3     35.7
  -24.0     47.9     44.4     24.4     34.3     32.3     35.4     24.3     34.1
34.6     39.8     36.3
  -18.0     48.2     44.7     24.5     34.5     32.9     34.7     24.2     33.9
35.1     40.4     37.0
  -12.0     48.6     45.1     24.5     34.6     33.2     34.0     24.1     33.6
35.6     41.0     37.7
   -6.0     49.0     45.5     24.5     34.6     33.1     33.3     23.9     33.3
```

36.2 41.7 38.4

.0	49.4	45.9	24.4	34.4	32.6	32.6	23.7	32.9	36.8	42.4	39.1
6.0	49.9	46.4	24.3	34.2	32.0	32.0	23.5	32.6	37.5	43.1	39.6
12.0	50.2	46.7	24.2	33.9	31.2	31.4	23.3	32.2	38.2	43.8	39.7
18.0	50.5	47.0	24.0	33.6	30.5	30.9	23.1	31.8	38.9	44.3	39.4
24.0	50.5	47.0	23.8	33.2	29.8	30.4	22.8	31.5	39.6	44.4	38.8
30.0	50.3	46.8	23.6	32.9	29.2	30.0	22.6	31.2	40.1	44.1	38.0
36.0	49.8	46.3	23.4	32.5	28.7	29.6	22.3	30.8	40.2	43.5	37.3
42.0	49.3	45.8	23.1	32.1	28.1	29.2	22.1	30.5	39.9	42.7	36.6
48.0	48.6	45.1	22.9	31.8	27.7	28.9	21.9	30.2	39.3	42.0	36.0
54.0	48.0	44.5	22.7	31.4	27.2	28.5	21.7	29.9	38.6	41.3	35.4
60.0	47.4	43.9	22.4	31.1	26.8	28.2	21.4	29.7	37.8	40.7	34.8
66.0	46.8	43.3	22.2	30.8	26.5	27.9	21.2	29.4	37.1	40.1	34.3
72.0	46.3	42.8	22.0	30.5	26.1	27.6	21.0	29.2	36.5	39.5	33.9
78.0	45.8	42.3	21.7	30.2	25.8	27.4	20.8	28.9	35.9	39.0	33.5
84.0	45.4	41.9	21.5	30.0	25.5	27.1	20.6	28.7	35.4	38.6	33.1
90.0	45.0	41.5	21.3	29.7	25.2	26.9	20.4	28.5	34.9	38.2	32.7
96.0	44.7	41.2	21.1	29.5	24.9	26.7	20.2	28.3	34.4	37.8	32.4
102.0	44.3	40.8	20.9	29.2	24.6	26.5	20.0	28.1	34.0	37.4	32.1
108.0	44.0	40.5	20.7	29.0	24.4	26.2	19.8	27.9	33.6	37.1	31.8
114.0	43.7	40.2	20.5	28.8	24.1	26.0	19.7	27.7	33.2	36.8	31.5
120.0	43.4	39.9	20.3	28.6	23.9	25.9	19.5	27.5	32.9	36.5	31.2
126.0	43.1	39.6	20.1	28.3	23.7	25.7	19.3	27.3	32.6	36.2	30.9
132.0	42.9	39.4	19.9	28.2	23.5	25.5	19.2	27.1	32.3	35.9	30.7
138.0	42.6	39.1	19.8	28.0	23.3	25.3	19.0	27.0	32.0	35.6	30.5
144.0	42.4	38.9	19.6	27.8	23.1	25.1	18.9	26.8			

31.7	35.4	30.2						
150.0	42.2	38.7	19.4	27.6	22.9	25.0	18.7	26.7
31.5	35.2	30.0						
156.0	42.0	38.5	19.3	27.4	22.7	24.8	18.6	26.5
31.2	34.9	29.8						
162.0	41.8	38.3	19.1	27.3	22.6	24.7	18.5	26.4
31.0	34.7	29.6						
168.0	41.6	38.1	19.0	27.1	22.4	24.5	18.3	26.2
30.8	34.5	29.4						
174.0	41.4	37.9	18.8	26.9	22.2	24.4	18.2	26.1
30.6	34.3	29.3						
180.0	41.2	37.7	18.7	26.8	22.1	24.2	18.1	25.9
30.4	34.1	29.1						
186.0	41.1	37.6	18.5	26.6	21.9	24.1	17.9	25.8
30.2	34.0	28.9						
192.0	40.9	37.4	18.4	26.5	21.8	24.0	17.8	25.7
30.0	33.8	28.8						
198.0	40.7	37.2	18.3	26.4	21.6	23.9	17.7	25.5
29.8	33.6	28.6						
204.0	40.6	37.1	18.1	26.2	21.5	23.7	17.6	25.4
29.6	33.5	28.4						
210.0	40.4	36.9	18.0	26.1	21.4	23.6	17.5	25.3
29.4	33.3	28.3						
216.0	40.3	36.8	17.9	26.0	21.2	23.5	17.3	25.2
29.3	33.1	28.1						
222.0	40.1	36.6	17.8	25.8	21.1	23.4	17.2	25.1
29.1	33.0	28.0						
228.0	40.0	36.5	17.6	25.7	21.0	23.3	17.1	25.0
29.0	32.8	27.9						
234.0	39.9	36.4	17.5	25.6	20.9	23.1	17.0	24.9
28.8	32.7	27.7						
240.0	39.7	36.2	17.4	25.5	20.7	23.0	16.9	24.7
28.7	32.6	27.6						
246.0	39.6	36.1	17.3	25.4	20.6	22.9	16.8	24.6
28.5	32.4	27.5						
252.0	39.5	36.0	17.2	25.3	20.5	22.8	16.7	24.5
28.4	32.3	27.4						
258.0	39.4	35.9	17.1	25.1	20.4	22.7	16.6	24.4
28.3	32.2	27.2						
264.0	39.2	35.7	17.0	25.0	20.3	22.6	16.5	24.3
28.1	32.1	27.1						
270.0	39.1	35.6	16.9	24.9	20.2	22.5	16.4	24.2
28.0	31.9	27.0						
276.0	39.0	35.5	16.8	24.8	20.1	22.4	16.3	24.1
27.9	31.8	26.9						
282.0	38.9	35.4	16.7	24.7	20.0	22.3	16.2	24.1
27.8	31.7	26.8						
288.0	38.8	35.3	16.6	24.6	19.9	22.2	16.1	24.0
27.6	31.6	26.7						
294.0	38.7	35.2	16.5	24.5	19.8	22.1	16.1	23.9

27.5 31.5 26.6

1AUDIBLE NOISE CALCULATION - FAIR

DIST FROM REFERENCE (FEET)	TOTALS L5 (DBA)	L50 (DBA)	A1S	B1S	C1S	C2S	A2S	B2S	A1N	B1N	C1N
-300.0	13.3	9.8	-8.3	-.2	-5.0	-1.8	-7.9	-.1	1.3	5.6	1.1
-294.0	13.4	9.9	-8.2	-.1	-4.9	-1.7	-7.8	.0	1.4	5.7	1.2
-288.0	13.5	10.0	-8.1	.0	-4.8	-1.6	-7.7	.1	1.5	5.8	1.3
-282.0	13.6	10.1	-8.0	.1	-4.7	-1.5	-7.6	.2	1.6	5.9	1.4
-276.0	13.7	10.2	-7.9	.2	-4.6	-1.3	-7.5	.4	1.6	6.0	1.5
-270.0	13.8	10.3	-7.8	.3	-4.4	-1.2	-7.4	.5	1.7	6.1	1.6
-264.0	13.9	10.4	-7.6	.4	-4.3	-1.1	-7.3	.6	1.8	6.2	1.7
-258.0	14.0	10.5	-7.5	.5	-4.2	-1.0	-7.1	.7	1.9	6.3	1.8
-252.0	14.1	10.6	-7.4	.7	-4.1	-.8	-7.0	.9	2.0	6.4	1.9
-246.0	14.2	10.7	-7.3	.8	-4.0	-.7	-6.9	1.0	2.1	6.5	2.1
-240.0	14.4	10.9	-7.2	.9	-3.8	-.5	-6.8	1.1	2.3	6.6	2.2
-234.0	14.5	11.0	-7.1	1.0	-3.7	-.4	-6.6	1.3	2.4	6.8	2.3
-228.0	14.6	11.1	-6.9	1.2	-3.6	-.2	-6.5	1.4	2.5	6.9	2.4
-222.0	14.7	11.2	-6.8	1.3	-3.4	-.1	-6.3	1.6	2.6	7.0	2.5
-216.0	14.9	11.4	-6.7	1.4	-3.3	.1	-6.2	1.7	2.7	7.1	2.7
-210.0	15.0	11.5	-6.5	1.6	-3.2	.2	-6.0	1.9	2.8	7.2	2.8
-204.0	15.1	11.6	-6.4	1.7	-3.0	.4	-5.9	2.1	2.9	7.4	2.9
-198.0	15.3	11.8	-6.3	1.9	-2.8	.6	-5.7	2.2	3.1	7.5	3.1
-192.0	15.4	11.9	-6.1	2.0	-2.7	.8	-5.6	2.4	3.2	7.6	3.2
-186.0	15.6	12.1	-6.0	2.2	-2.5	.9	-5.4	2.6	3.3	7.8	3.4

-180.0	15.7	12.2	-5.8	2.3	-2.4	1.1	-5.2	2.8	3.5	7.9	3.5
-174.0	15.9	12.4	-5.7	2.5	-2.2	1.3	-5.1	3.0	3.6	8.1	3.7
-168.0	16.1	12.6	-5.5	2.7	-2.0	1.6	-4.9	3.2	3.7	8.2	3.8
-162.0	16.2	12.7	-5.3	2.9	-1.8	1.8	-4.7	3.4	3.9	8.4	4.0
-156.0	16.4	12.9	-5.2	3.1	-1.6	2.0	-4.5	3.6	4.0	8.5	4.2
-150.0	16.6	13.1	-5.0	3.2	-1.4	2.3	-4.3	3.8	4.2	8.7	4.4
-144.0	16.8	13.3	-4.8	3.4	-1.2	2.5	-4.1	4.0	4.4	8.9	4.5
-138.0	17.0	13.5	-4.6	3.7	-1.0	2.8	-3.9	4.3	4.5	9.1	4.7
-132.0	17.2	13.7	-4.4	3.9	-.7	3.1	-3.7	4.5	4.7	9.2	4.9
-126.0	17.4	13.9	-4.2	4.1	-.5	3.4	-3.5	4.8	4.9	9.4	5.1
-120.0	17.6	14.1	-4.0	4.3	-.2	3.7	-3.2	5.1	5.1	9.6	5.4
-114.0	17.9	14.4	-3.8	4.6	.0	4.0	-3.0	5.4	5.3	9.8	5.6
-108.0	18.1	14.6	-3.6	4.8	.3	4.4	-2.8	5.7	5.5	10.1	5.8
-102.0	18.4	14.9	-3.4	5.1	.6	4.8	-2.5	6.0	5.7	10.3	6.1
-96.0	18.7	15.2	-3.2	5.4	.9	5.2	-2.3	6.3	5.9	10.5	6.3
-90.0	19.0	15.5	-2.9	5.7	1.3	5.7	-2.1	6.7	6.1	10.8	6.6
-84.0	19.3	15.8	-2.7	6.0	1.6	6.2	-1.8	7.0	6.4	11.0	6.9
-78.0	19.6	16.1	-2.5	6.3	2.0	6.7	-1.6	7.4	6.6	11.3	7.2
-72.0	19.9	16.4	-2.2	6.6	2.4	7.3	-1.4	7.8	6.9	11.6	7.5
-66.0	20.3	16.8	-2.0	7.0	2.9	7.9	-1.2	8.1	7.1	11.9	7.9
-60.0	20.7	17.2	-1.7	7.3	3.4	8.6	-1.0	8.5	7.4	12.2	8.3
-54.0	21.1	17.6	-1.5	7.7	3.9	9.4	-.8	8.8	7.7	12.6	8.7
-48.0	21.5	18.0	-1.3	8.0	4.5	10.1	-.7	9.0	8.1	13.0	9.1
-42.0	21.9	18.4	-1.1	8.4	5.2	10.7	-.6	9.2	8.4	13.4	9.6
-36.0	22.3	18.8	-.9	8.8	5.9	11.0	-.6	9.3	8.8	13.8	10.1

-30.0	22.6	19.1	-.7	9.1	6.6	10.9	-.6	9.3	9.2	14.3	10.7
-24.0	22.9	19.4	-.6	9.3	7.3	10.4	-.7	9.1	9.6	14.8	11.3
-18.0	23.2	19.7	-.5	9.5	7.9	9.7	-.8	8.9	10.1	15.4	12.0
-12.0	23.6	20.1	-.5	9.6	8.2	9.0	-.9	8.6	10.6	16.0	12.7
-6.0	24.0	20.5	-.5	9.6	8.1	8.3	-1.1	8.3	11.2	16.7	13.4
.0	24.4	20.9	-.6	9.4	7.6	7.6	-1.3	7.9	11.8	17.4	14.1
6.0	24.9	21.4	-.7	9.2	7.0	7.0	-1.5	7.6	12.5	18.1	14.6
12.0	25.2	21.7	-.8	8.9	6.2	6.4	-1.7	7.2	13.2	18.8	14.7
18.0	25.5	22.0	-1.0	8.6	5.5	5.9	-1.9	6.8	13.9	19.3	14.4
24.0	25.5	22.0	-1.2	8.2	4.8	5.4	-2.2	6.5	14.6	19.4	13.8
30.0	25.3	21.8	-1.4	7.9	4.2	5.0	-2.4	6.2	15.1	19.1	13.0
36.0	24.8	21.3	-1.6	7.5	3.7	4.6	-2.7	5.8	15.2	18.5	12.3
42.0	24.3	20.8	-1.9	7.1	3.1	4.2	-2.9	5.5	14.9	17.7	11.6
48.0	23.6	20.1	-2.1	6.8	2.7	3.9	-3.1	5.2	14.3	17.0	11.0
54.0	23.0	19.5	-2.3	6.4	2.2	3.5	-3.3	4.9	13.6	16.3	10.4
60.0	22.4	18.9	-2.6	6.1	1.8	3.2	-3.6	4.7	12.8	15.7	9.8
66.0	21.8	18.3	-2.8	5.8	1.5	2.9	-3.8	4.4	12.1	15.1	9.3
72.0	21.3	17.8	-3.0	5.5	1.1	2.6	-4.0	4.2	11.5	14.5	8.9
78.0	20.8	17.3	-3.3	5.2	.8	2.4	-4.2	3.9	10.9	14.0	8.5
84.0	20.4	16.9	-3.5	5.0	.5	2.1	-4.4	3.7	10.4	13.6	8.1
90.0	20.0	16.5	-3.7	4.7	.2	1.9	-4.6	3.5	9.9	13.2	7.7
96.0	19.7	16.2	-3.9	4.5	-.1	1.7	-4.8	3.3	9.4	12.8	7.4
102.0	19.3	15.8	-4.1	4.2	-.4	1.5	-5.0	3.1	9.0	12.4	7.1
108.0	19.0	15.5	-4.3	4.0	-.6	1.2	-5.2	2.9	8.6	12.1	6.8
114.0	18.7	15.2	-4.5	3.8	-.9	1.0	-5.3	2.7	8.2	11.8	6.5

120.0	18.4	14.9	-4.7	3.6	-1.1	.9	-5.5	2.5	7.9	11.5	6.2
126.0	18.1	14.6	-4.9	3.3	-1.3	.7	-5.7	2.3	7.6	11.2	5.9
132.0	17.9	14.4	-5.1	3.2	-1.5	.5	-5.8	2.1	7.3	10.9	5.7
138.0	17.6	14.1	-5.2	3.0	-1.7	.3	-6.0	2.0	7.0	10.6	5.5
144.0	17.4	13.9	-5.4	2.8	-1.9	.1	-6.1	1.8	6.7	10.4	5.2
150.0	17.2	13.7	-5.6	2.6	-2.1	.0	-6.3	1.7	6.5	10.2	5.0
156.0	17.0	13.5	-5.7	2.4	-2.3	-.2	-6.4	1.5	6.2	9.9	4.8
162.0	16.8	13.3	-5.9	2.3	-2.4	-.3	-6.5	1.4	6.0	9.7	4.6
168.0	16.6	13.1	-6.0	2.1	-2.6	-.5	-6.7	1.2	5.8	9.5	4.4
174.0	16.4	12.9	-6.2	1.9	-2.8	-.6	-6.8	1.1	5.6	9.3	4.3
180.0	16.2	12.7	-6.3	1.8	-2.9	-.8	-6.9	.9	5.4	9.1	4.1
186.0	16.1	12.6	-6.5	1.6	-3.1	-.9	-7.1	.8	5.2	9.0	3.9
192.0	15.9	12.4	-6.6	1.5	-3.2	-1.0	-7.2	.7	5.0	8.8	3.8
198.0	15.7	12.2	-6.7	1.4	-3.4	-1.1	-7.3	.5	4.8	8.6	3.6
204.0	15.6	12.1	-6.9	1.2	-3.5	-1.3	-7.4	.4	4.6	8.5	3.4
210.0	15.4	11.9	-7.0	1.1	-3.6	-1.4	-7.5	.3	4.4	8.3	3.3
216.0	15.3	11.8	-7.1	1.0	-3.8	-1.5	-7.7	.2	4.3	8.1	3.1
222.0	15.1	11.6	-7.2	.8	-3.9	-1.6	-7.8	.1	4.1	8.0	3.0
228.0	15.0	11.5	-7.4	.7	-4.0	-1.7	-7.9	.0	4.0	7.8	2.9
234.0	14.9	11.4	-7.5	.6	-4.1	-1.9	-8.0	-.1	3.8	7.7	2.7
240.0	14.7	11.2	-7.6	.5	-4.3	-2.0	-8.1	-.3	3.7	7.6	2.6
246.0	14.6	11.1	-7.7	.4	-4.4	-2.1	-8.2	-.4	3.5	7.4	2.5
252.0	14.5	11.0	-7.8	.3	-4.5	-2.2	-8.3	-.5	3.4	7.3	2.4
258.0	14.4	10.9	-7.9	.1	-4.6	-2.3	-8.4	-.6	3.3	7.2	2.2
264.0	14.2	10.7	-8.0	.0	-4.7	-2.4	-8.5	-.7	3.1	7.1	2.1

270.0	14.1	10.6	-8.1	-.1	-4.8	-2.5	-8.6	-.8	3.0	6.9	2.0
276.0	14.0	10.5	-8.2	-.2	-4.9	-2.6	-8.7	-.9	2.9	6.8	1.9
282.0	13.9	10.4	-8.3	-.3	-5.0	-2.7	-8.8	-.9	2.8	6.7	1.8
288.0	13.8	10.3	-8.4	-.4	-5.1	-2.8	-8.9	-1.0	2.6	6.6	1.7
294.0	13.7	10.2	-8.5	-.5	-5.2	-2.9	-8.9	-1.1	2.5	6.5	1.6

1ELECTRIC FIELD CALCULATIONS

SUNSTONE SOLAR T LINE PARALLEL
RUN 2 20230601

	DIST. FROM REFERENCE FEET	HEIGHT FEET	MAXIMUM GRADIENT (KV/CM)	SUBCON. DIAM. (IN)	NO. OF SUBCON.	PHASE ANGLE (DEGREES)
A1S	-10.50	66.75	10.24	1.50	1	.0
B1S	-10.50	45.25	11.94	1.50	1	120.0
C1S	-10.50	25.00	10.88	1.50	1	240.0
C2S	-34.50	25.00	11.48	1.50	1	240.0
A2S	-34.50	66.75	10.22	1.50	1	.0
B2S	-34.50	45.25	11.87	1.50	1	120.0
A1N	34.50	25.00	12.44	1.50	1	.0
B1N	22.50	25.00	13.48	1.50	1	120.0
C1N	10.50	25.00	12.32	1.50	1	240.0

SENSOR HT. = 3.3 FEET

DIST FROM REFERENCE FEET	E-FIELD (KV/METER)	THETA (DEGREES)	EY-FIELD (KV/METER)	THETAY (DEGREES)	EX-FIELD (KV/METER)	THETAX (DEGREES)	SPACE POTENTIAL (VOLTS)
-300.0	.087	88.8	.087	-160.3	.002	-159.1	87.2
-294.0	.091	88.8	.091	-160.3	.002	-159.0	90.6
-288.0	.094	88.8	.094	-160.2	.002	-158.8	94.2
-282.0	.098	88.7	.098	-160.1	.002	-158.7	98.1
-276.0	.102	88.7	.102	-160.1	.002	-158.6	102.1
-270.0	.106	88.7	.106	-160.0	.002	-158.4	106.4
-264.0	.111	88.7	.111	-160.0	.003		

-158.3	111.0				
-258.0	.116	88.7	.116	-159.9	.003
-158.1	115.9				
-252.0	.121	88.6	.121	-159.8	.003
-157.9	121.0				
-246.0	.126	88.6	.126	-159.7	.003
-157.7	126.5				
-240.0	.132	88.6	.132	-159.6	.003
-157.4	132.3				
-234.0	.138	88.6	.138	-159.5	.003
-157.2	138.4				
-228.0	.145	88.5	.145	-159.4	.004
-156.9	145.0				
-222.0	.152	88.5	.152	-159.3	.004
-156.6	152.0				
-216.0	.160	88.5	.159	-159.1	.004
-156.2	159.5				
-210.0	.167	88.5	.167	-159.0	.004
-155.8	167.4				
-204.0	.176	88.4	.176	-158.8	.005
-155.4	175.8				
-198.0	.185	88.4	.185	-158.7	.005
-154.9	184.8				
-192.0	.194	88.4	.194	-158.5	.005
-154.3	194.3				
-186.0	.205	88.4	.204	-158.2	.006
-153.6	204.4				
-180.0	.215	88.4	.215	-158.0	.006
-152.9	215.1				
-174.0	.226	88.4	.226	-157.7	.006
-151.9	226.4				
-168.0	.238	88.4	.238	-157.4	.007
-150.8	238.2				
-162.0	.251	88.4	.251	-157.0	.007
-149.5	250.5				
-156.0	.263	88.5	.263	-156.6	.007
-147.8	263.2				
-150.0	.276	88.5	.276	-156.2	.007
-145.7	276.1				
-144.0	.289	88.6	.289	-155.6	.007
-142.8	288.9				
-138.0	.302	88.8	.302	-155.0	.007
-138.7	301.3				
-132.0	.313	88.9	.313	-154.3	.006
-132.1	312.7				
-126.0	.323	89.2	.323	-153.4	.005
-120.2	322.1				
-120.0	.329	89.6	.329	-152.4	.004
-94.3	328.3				
-114.0	.330	90.2	.330	-151.2	.005

-45.8	329.5				
-108.0	.324	91.1	.324	-149.6	.008
-10.4	322.8				
-102.0	.307	92.6	.306	-147.5	.016
6.1	304.5				
-96.0	.273	95.4	.272	-144.6	.027
15.3	268.8				
-90.0	.216	101.3	.212	-139.6	.044
21.9	207.8				
-84.0	.134	119.3	.118	-126.0	.070
27.5	112.1				
-78.0	.120	28.4	.070	-14.2	.107
32.5	74.4				
-72.0	.331	61.1	.291	24.3	.163
37.4	301.8				
-66.0	.688	69.7	.646	32.8	.241
42.1	661.7				
-60.0	1.220	73.6	1.171	37.9	.348
46.3	1191.3				
-54.0	1.972	76.2	1.915	41.9	.475
49.9	1936.2				
-48.0	2.947	78.7	2.891	45.1	.580
52.4	2901.4				
-42.0	4.032	81.8	3.991	47.3	.576
53.3	3974.6				
-36.0	4.956	85.2	4.938	48.4	.416
51.4	4899.0				
-30.0	5.502	87.7	5.497	48.4	.218
45.7	5468.3				
-24.0	5.779	88.7	5.777	48.2	.134
45.8	5770.2				
-18.0	6.010	89.0	6.009	48.3	.110
53.2	5997.2				
-12.0	6.144	90.0	6.144	48.4	.015
-51.3	6113.0				
-6.0	5.980	91.8	5.977	47.6	.201
-109.9	5942.5				
.0	5.492	93.7	5.480	45.5	.389
-110.7	5445.3				
6.0	4.701	96.9	4.667	41.2	.626
-113.2	4616.0				
12.0	3.506	103.4	3.412	31.6	.913
-119.8	3358.6				
18.0	2.040	116.4	1.847	7.5	1.059
-133.0	1805.8				
24.0	1.080	40.8	.985	-73.5	1.010
-153.7	912.2				
30.0	2.077	71.2	1.973	-135.2	.809
-174.1	1900.8				
36.0	2.907	83.5	2.889	-153.0	.426

166.8	2808.7				
42.0	3.111	90.6	3.111	-159.8	.128
95.2	3056.3				
48.0	2.820	94.5	2.812	-162.3	.225
28.1	2793.0				
54.0	2.353	96.2	2.339	-163.0	.255
18.2	2340.8				
60.0	1.906	96.7	1.893	-162.8	.221
15.6	1900.7				
66.0	1.542	96.5	1.532	-162.3	.174
15.1	1540.0				
72.0	1.262	96.0	1.255	-161.7	.132
15.4	1261.6				
78.0	1.050	95.5	1.046	-161.2	.101
16.0	1050.2				
84.0	.889	95.0	.885	-160.7	.077
16.7	888.8				
90.0	.764	94.5	.761	-160.4	.060
17.4	763.8				
96.0	.665	94.1	.664	-160.1	.048
18.1	665.4				
102.0	.587	93.8	.585	-159.9	.039
18.7	586.5				
108.0	.522	93.5	.521	-159.8	.032
19.2	522.2				
114.0	.469	93.3	.468	-159.7	.027
19.7	468.9				
120.0	.424	93.0	.424	-159.6	.022
20.0	424.2				
126.0	.386	92.9	.386	-159.6	.019
20.3	386.1				
132.0	.353	92.7	.353	-159.6	.017
20.5	353.4				
138.0	.325	92.6	.325	-159.6	.015
20.6	325.0				
144.0	.300	92.4	.300	-159.7	.013
20.8	300.1				
150.0	.278	92.3	.278	-159.7	.011
20.8	278.2				
156.0	.259	92.2	.259	-159.8	.010
20.9	258.7				
162.0	.241	92.1	.241	-159.8	.009
20.9	241.3				
168.0	.226	92.1	.226	-159.9	.008
20.9	225.7				
174.0	.212	92.0	.212	-159.9	.007
20.9	211.6				
180.0	.199	91.9	.199	-159.9	.007
20.8	198.9				
186.0	.187	91.9	.187	-160.0	.006

						20.8	187.3
192.0	.177	91.8	.177	-160.0	.006	20.8	176.7
198.0	.167	91.7	.167	-160.1	.005	20.7	167.0
204.0	.158	91.7	.158	-160.1	.005	20.7	158.1
210.0	.150	91.6	.150	-160.2	.004	20.6	149.9
216.0	.142	91.6	.142	-160.2	.004	20.6	142.3
222.0	.135	91.6	.135	-160.3	.004	20.5	135.3
228.0	.129	91.5	.129	-160.3	.003	20.5	128.8
234.0	.123	91.5	.123	-160.3	.003	20.4	122.8
240.0	.117	91.4	.117	-160.4	.003	20.4	117.2
246.0	.112	91.4	.112	-160.4	.003	20.3	112.0
252.0	.107	91.4	.107	-160.4	.003	20.3	107.1
258.0	.103	91.4	.103	-160.5	.002	20.2	102.5
264.0	.098	91.3	.098	-160.5	.002	20.2	98.2
270.0	.094	91.3	.094	-160.5	.002	20.1	94.2
276.0	.090	91.3	.090	-160.5	.002	20.1	90.4
282.0	.087	91.2	.087	-160.6	.002	20.1	86.9
288.0	.084	91.2	.084	-160.6	.002	20.0	83.5
294.0	.080	91.2	.080	-160.6	.002	20.0	80.4

1MAGNETIC FIELD CALCULATIONS

SENSOR HT. = 3.3 FEET

DIST FROM REFERENCE FEET	B-FIELD (GAUSS)	THETA	BY-FIELD (GAUSS)	THETAY	BX-FIELD (GAUSS)	THETAX
-300.0	.00336490	29.1	.00164179	25.6	.00293930	30.1
-294.0	.00351296	29.5	.00173046	25.6	.00305953	30.1
-288.0	.00367093	29.8	.00182617	25.6	.00318705	30.2

-282.0	.00383970	30.1	.00192967	25.5	.00332244	30.3
-276.0	.00402025	30.5	.00204179	25.5	.00346633	30.3
-270.0	.00421372	30.8	.00216347	25.5	.00361942	30.4
-264.0	.00442133	31.2	.00229579	25.4	.00378247	30.5
-258.0	.00464449	31.6	.00243996	25.4	.00395631	30.5
-252.0	.00488477	32.0	.00259739	25.4	.00414186	30.6
-246.0	.00514395	32.5	.00276967	25.4	.00434012	30.7
-240.0	.00542402	33.0	.00295865	25.3	.00455221	30.8
-234.0	.00572727	33.5	.00316643	25.3	.00477932	30.9
-228.0	.00605627	34.0	.00339548	25.3	.00502280	31.0
-222.0	.00641399	34.6	.00364862	25.3	.00528409	31.2
-216.0	.00680380	35.2	.00392919	25.3	.00556481	31.3
-210.0	.00722959	35.8	.00424105	25.3	.00586668	31.5
-204.0	.00769582	36.5	.00458875	25.3	.00619160	31.6
-198.0	.00820767	37.2	.00497763	25.3	.00654161	31.8
-192.0	.00877116	38.0	.00541403	25.3	.00691891	32.0
-186.0	.00939328	38.8	.00590549	25.4	.00732580	32.3
-180.0	.01008224	39.7	.00646096	25.4	.00776472	32.5
-174.0	.01084769	40.7	.00709119	25.5	.00823812	32.8
-168.0	.01170101	41.7	.00780913	25.5	.00874841	33.2
-162.0	.01265571	42.8	.00863039	25.6	.00929780	33.6
-156.0	.01372792	44.1	.00957396	25.7	.00988807	34.0
-150.0	.01493692	45.4	.01066296	25.9	.01052019	34.5
-144.0	.01630598	46.8	.01192571	26.1	.01119382	35.1
-138.0	.01786325	48.4	.01339701	26.3	.01190650	35.7
-132.0	.01964300	50.2	.01511975	26.5	.01265238	36.5
-126.0	.02168721	52.1	.01714699	26.9	.01342048	37.4
-120.0	.02404754	54.2	.01954438	27.3	.01419192	38.6
-114.0	.02678794	56.5	.02239321	27.7	.01493585	39.9
-108.0	.02998800	59.2	.02579385	28.3	.01560344	41.6
-102.0	.03374723	62.1	.02986933	29.0	.01611883	43.7
-96.0	.03819046	65.4	.03476840	29.9	.01636623	46.5
-90.0	.04347457	69.1	.04066614	30.9	.01617233	50.3
-84.0	.04979584	73.4	.04775751	32.2	.01528861	55.9
-78.0	.05739640	78.4	.05623354	33.7	.01340756	65.4
-72.0	.06656328	84.1	.06621580	35.4	.01046105	85.2
-66.0	.07760245	90.9	.07759379	37.3	.00902448	134.6
-60.0	.09074158	98.9	.08965389	39.4	.01700665	184.4
-54.0	.10585670	108.7	.10034040	41.4	.03507720	204.5
-48.0	.12187070	120.3	.10525710	42.9	.06200258	213.9
-42.0	.13596820	133.9	.09805380	43.5	.09436464	218.7
-36.0	.14421910	148.2	.07608815	42.4	.12252860	220.7
-30.0	.14594560	160.9	.04768007	39.3	.13794220	220.8
-24.0	.14702040	171.0	.02307840	34.6	.14521560	220.4
-18.0	.15328710	-179.7	.00327820	-62.1	.15328540	220.6
-12.0	.16275310	-168.8	.03217823	232.6	.15966850	220.9
-6.0	.16997470	-156.5	.06858610	231.0	.15597780	220.1
.0	.17520060	-144.3	.10344460	230.1	.14262060	217.4
6.0	.18205510	-131.5	.13746250	228.6	.12233070	211.8
12.0	.18862770	-116.8	.16911850	225.3	.09123472	198.7

18.0	.18902140	-100.5	.18602280	219.1	.05606592	164.6
24.0	.18106360	-83.7	.18003150	210.3	.04933522	98.1
30.0	.16511660	-66.2	.15182290	202.0	.07439620	54.1
36.0	.14145010	-48.6	.10730110	196.9	.09509898	35.8
42.0	.11383260	-32.9	.06280267	194.7	.09578563	28.6
48.0	.08825820	-20.8	.03178948	194.7	.08255485	26.4
54.0	.06801730	-12.3	.01471371	196.0	.06645646	26.3
60.0	.05318242	-6.8	.00641361	198.2	.05280332	27.0
66.0	.04255550	-3.5	.00260289	200.7	.04247709	27.9
72.0	.03489584	-1.5	.00089783	201.6	.03488448	28.8
78.0	.02926499	-.3	.00016256	179.1	.02926465	29.6
84.0	.02502157	.4	.00022116	62.6	.02502087	30.1
90.0	.02174109	.9	.00036598	58.4	.02173869	30.5
96.0	.01914342	1.1	.00043599	60.8	.01913970	30.8
102.0	.01704158	1.3	.00047058	63.6	.01703697	30.9
108.0	.01530853	1.5	.00048788	65.8	.01530328	31.0
114.0	.01385614	1.7	.00049597	67.1	.01385032	31.1
120.0	.01262190	1.8	.00049871	67.6	.01261553	31.1
126.0	.01156049	2.0	.00049818	67.5	.01155354	31.1
132.0	.01063837	2.2	.00049558	66.9	.01063079	31.0
138.0	.00983019	2.3	.00049164	66.1	.00982194	31.0
144.0	.00911649	2.5	.00048683	64.9	.00910754	30.9
150.0	.00848203	2.7	.00048145	63.7	.00847237	30.9
156.0	.00791473	2.9	.00047567	62.4	.00790434	30.8
162.0	.00740486	3.1	.00046961	61.0	.00739374	30.7
168.0	.00694450	3.3	.00046332	59.7	.00693267	30.7
174.0	.00652713	3.6	.00045687	58.4	.00651460	30.6
180.0	.00614732	3.8	.00045026	57.2	.00613412	30.5
186.0	.00580052	4.0	.00044352	56.0	.00578667	30.5
192.0	.00548287	4.2	.00043667	54.8	.00546842	30.4
198.0	.00519110	4.4	.00042973	53.8	.00517608	30.4
204.0	.00492238	4.6	.00042272	52.8	.00490683	30.3
210.0	.00467429	4.7	.00041565	51.8	.00465826	30.3
216.0	.00444473	4.9	.00040854	50.9	.00442825	30.2
222.0	.00423185	5.1	.00040141	50.1	.00421497	30.2
228.0	.00403405	5.3	.00039427	49.3	.00401681	30.1
234.0	.00384992	5.5	.00038714	48.6	.00383235	30.1
240.0	.00367820	5.7	.00038004	47.9	.00366035	30.0
246.0	.00351779	5.8	.00037297	47.2	.00349969	30.0
252.0	.00336772	6.0	.00036597	46.6	.00334939	30.0
258.0	.00322709	6.1	.00035902	46.0	.00320858	29.9
264.0	.00309512	6.3	.00035215	45.5	.00307646	29.9
270.0	.00297112	6.4	.00034537	45.0	.00295234	29.9
276.0	.00285445	6.6	.00033868	44.5	.00283556	29.8
282.0	.00274454	6.7	.00033209	44.0	.00272558	29.8
288.0	.00264087	6.9	.00032560	43.6	.00262186	29.8
294.0	.00254298	7.0	.00031922	43.2	.00252394	29.8

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