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April 16, 2012

427930.DI.DR

Mike Monasmith
Senior Project Manager
Systems Assessment & Facility Siting Division
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814

Subject: Data Response, Set 2D-2
Hidden Hills Solar Electric Generating System (11-AFC-2)

Dear Mr. Monasmith:

On behalf of Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC, please find attached an electronic copy of Data Response Set 2D-2 in response to Staff's Data Request Set 2D filed on February 3, 2012.

This data response set is being filed electronically and will be followed up with hard copies. Please call me if you have any questions.

Sincerely,

CH2M HILL

John L. Carrier, J.D.
Program Manager

Encl.

c: POS List
Project file

Data Response Set 2D-2

Hidden Hills

Solar Electric Generating System

(11-AFC-2)

Application for Certification

Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC

April 16, 2012

With Technical Assistance from

CH2MHILL®

IS061411043744SAC

Hidden Hills Solar Electric Generating System (HHSEGS)

(11-AFC-2)

Data Response, Set 2D-2 (Response to Data Requests 158 – 165, and 167- 171)

Submitted to the

California Energy Commission

Submitted by

Hidden Hills Solar I, LLC; and Hidden Hills Solar II, LLC

April 16, 2012

With Assistance from

CH2MHILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

Contents

Figures

Introduction

Attached are Hidden Hills Solar I, LLC, and Hidden Hills Solar II, LLC (collectively, "Applicant") responses to the California Energy Commission (CEC) Staff's data requests numbers 158 – 165 and 167 - 171 for the Hidden Hills Solar Electric Generating System (HHSEGS) Project (11-AFC-2). The CEC Staff served these data requests on March 9, 2012.

Applicant both objected and reserved the right to respond to Data Requests 167 through 171, and, without waiving those objections, Applicant will provide responses where the information requested was both relevant and reasonably available. Per the discussion at the last Status Conference, the response to Data Requests 158 through 165 were coordinated with responses to similar data requests posed by Staff in the Rio Mesa proceeding. Data Request 172, which required waters delineations by state and federal agencies, will be provided on or before April 23rd. Data Requests 174, 175, and 176 are Staff's requests for information based on spring 2012 plant surveys. As agreed to with Staff, additional surveys conducted this spring will be completed and the results processed before filing with Staff.

The responses are presented in the same order as provided by CEC Staff and are keyed to the Data Request numbers. New graphics or tables are numbered in reference to the data request number. For example, the first table used in response to Data Request 156 would be numbered Table DR156-1. The first figure used in response to Data Request 156 would be Figure DR156-1, and so on.

Figures submitted in response to a data request are at the end of this document and are also numbered to match the data request number. The figures are in numerical order of the data request number.

Biological Resources (158-165 and 167-171)

BACKGROUND: EFFECTS OF SOLAR POWER TOWER TECHNOLOGY ON AVIAN SPECIES

BACKGROUND

AFC section 2.2.1.2 states that a computer-programmed aiming control system will individually direct each heliostat to proper orientation relative to the sun. Staff understands that during the course of a typical day's operations, the heliostats are maintained in one of three primary positions: sleep position, during which the plant is not operating and heliostats are in a position that affords safety from the elements; stand-by position, in which one or more heliostats are oriented to reflect on a single point some unknown distance into the sky; and operational, during which heliostats are actively tracking the sun and focusing solar reflection on the solar receiver steam generator (SRSG). Heliostat position is known to be influential in bird flight paths, occasionally appearing as a body of water, and inviting mass landings of migrating birds. In evaluating potential effects of solar reflectance on avian species, staff requests the following information on the operating profile of the proposed project.

DATA REQUEST

158. Please provide a discussion of the operating profile on a seasonal and daily basis. Information provided should detail:

a. the amount of time spent in each of the three operating positions for both daily and seasonal operation;

b. a description of the location of heliostats expected to be in each position (for example in the eastern region of solar field 1), represented by sample maps (for both daily and seasonal operations); and,

c. the number of heliostats projected to be in each position (both daily and seasonal operation).

Response: Applicant is unaware of any studies, literature, or reports supporting Staff's statement that *"Heliostat position is known to be influential in bird flight paths, occasionally appearing as a body of water, and inviting mass landings of migrating birds,"* and would appreciate information from Staff on this supposition.

In addition, the Background description above, incorrectly states that the *"…stand-by position, in which one or more heliostats are oriented to reflect on a single point some unknown distance into the sky..."* The standby heliostats focus on a variety of points within a roughly ring-shaped area around and/or above the SRSG, not an *"unknown distance into the sky."*

During operation (from sunrise to sunset) heliostats will shift from the standby positions to the tracking positions fluidly throughout the day as needed to support the generating capacity of the Project. There is no predetermined number of heliostats in any given state. The correlation of the heliostat state (i.e., standby or tracking) is more sensitive to time of day then to the season of the year. At night, heliostats will be in sleep position (where they are in a vertical position with negative slope so as to not accumulate dust).

The number and location of heliostats in standby and operational states is influenced by the following factors:

- **Insolation**: with lower insolation, fewer heliostats will be in standby, while with higher insolation, more heliostats will be in standby;
- **Time of day**: The SRSG has a limited permitted flux that it can absorb, and under optimum operations, the cylindrical SRSG surface will receive sufficient flux from all directions to heat the surface evenly. During startup, in the morning, there could be more heliostats in standby position on the western side of the field (which receives the most direct sunlight) because fewer heliostats are required to provide the requisite flux to that portion of the SRSG. In the late afternoon, there may be larger numbers of heliostats in standby position on the eastern side of the field (as it begins to receive direct light from the setting sun)

The location of heliostats in each position is thus quite dynamic, dependent primarily on insolation and time of day, and there is no typical pattern except for the morning and late afternoon patterns mentioned above.

During full load operation, some of the heliostats will be in standby mode, not reflecting light on the SRSG. This number will vary according to time and season, and will be between 20 to 30 percent of the total number of heliostats. Further, during operation, a small number of the heliostats will be in maintenance and or cleaning states.

In all the above conditions, the project's control system will maintain operation within the flux limitation constraints.

DATA REQUEST

159. Please describe the height of focused reflectance by heliostats during stand-by position and factors used in determining the position of the stand-by positions.

Response: The heliostat in itself doesn't "focus" light at a specific "height" or "position" like a magnifying glass; rather it reflects a beam of light in a widening cone that starts at the heliostat's surface and either intercepts the SRSG (operational state) or avoids the tower altogether (standby state). The effect of focus is produced on the surface of the SRSG by the intersection of the beams of many heliostats, when desired for plant operation. In standby mode, there is no focused light. Reflected light concentrations will only occur where the standby directions of heliostats intersect. Therefore, the discussion here has to be understood in terms of the intersections of reflected light beams.

As previously described in Data Responses 28 and 29 (Data Response Set 1A), ***it is not the Applicant's practice to set a single common standby point on which the beams of all the heliostats of the field would intersect***, because this would cause unnecessary focus on a small area that is both not necessary and not beneficial.

Rather, it is the Applicant's practice to ***scatter the standby orientations of the heliostats around the SRSG*** so that few beams intersect at any given point in space, while retaining the capacity of each heliostat to transition quickly from operational to standby and conversely. Typically, intersections of beams leading to higher than ambient light concentrations would be observed only in a torus lying horizontally around the receiver, at the same height as the receiver, or above the receiver.

The factors used to determine the standby strategy are:

1. Provide safe distance between the reflected beams in standby position and the tower.

2. Minimize the time needed for transition from operational to standby state and conversely.

3. Avoid high concentrations of flux in standby positions and beyond the plant boundaries.

DATA REQUEST

160. Describe the operating parameters in altering the number, location, or duration of heliostats in stand-by position relative to the likely seasonality of use of stand-by position. Staff believes that reduced solar insolation during winter and spring may coincide with avian migration, and understands that the stand-by position is utilized more often during periods of diminished solar insolation. Please describe the feasibility of implementing an adaptive management approach to minimize potential adverse affects to birds from solar energy, and the measures that might be employed as part of an adaptive management program.

Response: As stated above in response to Data Response 158, the heliostat state (i.e., standby or tracking) correlates more to time of day rather than to the season of the year.

The Applicant uses an approach for standby that limits the flux concentration, regardless of the number of heliostats in standby mode and their location in the solar field. The Applicant's operations will limit the flux in the standby mode to 500kW/m^2. Beyond the standby area, flux levels decrease to less than 10 kW/m^2. During normal operation, the number of heliostats that are not aiming at the SRSG are anywhere from zero to 30 percent. The standby strategy and flux limiting strategy we use significantly reduces the flux concentration in the air, as compared to the old-fashion standby points used at Solar One.

BACKGROUND

AFC section 2.2.1.2 states that a computer-programmed aiming control system will individually direct each heliostat to proper orientation relative to the sun. Staff understands that during the course of a typical day's operations, the heliostats are maintained in one of three primary positions: sleep position, during which the plant is not operating and heliostats are in a position that affords safety from the elements; stand-by position, in which one or more heliostats are oriented to reflect on a single point some unknown distance into the sky; and operational, during which heliostats are actively tracking the sun and focusing solar reflection on the solar receiver steam generator (SRSG). Heliostat position is known to be influential in bird flight paths, occasionally appearing as a body of water, and inviting mass landings of migrating birds. In evaluating potential effects of solar reflectance on avian species, staff requests the following information on the operating profile of the proposed project.

DATA REQUEST

161. Please provide four diagrams in profile view of reflected solar flux, each should be modeled at 100% of project output. The diagrams must depict clearly, in kw/m2, solar flux from power tower to heliostats. Please provide a diagram for reflected solar flux from heliostats at the following four locations: closest to power tower 1, furthest from power tower 1 (approximately 7,700 feet), closest to power tower 2, and furthest from

power tower 2 (approximately 6,500 feet). Please also clearly indicate linear distance encompassed by each zone of flux, in meters.

Response: Applicant is unaware of any studies, literature, or reports supporting Staff's statement that *"Heliostat position is known to be influential in bird flight paths, occasionally appearing as a body of water, and inviting mass landings of migrating birds,"* and would appreciate additional guidance on this supposition.

In addition, the Background description above (and also provided in Data Request 158) incorrectly states that the *"…stand-by position, in which one or more heliostats are oriented to reflect on a single point some unknown distance into the sky..."* The standby heliostats focus on a variety of points within a roughly ring-shaped area around and/or above the SRSG, not an "*unknown distance into the sky*."

The following data show the results from the Applicant's three dimensional (3-D) model. This model is valid for all current BrightSource 250MW power tower projects (i.e., Hidden Hills SEGS and Rio Mesa SEGF). The differences in project layouts will not affect the flux projections. Direction and exact shape of the flux will vary according to time (day and season).

The following diagrams are all in kW/m^2. The color scales vary among the diagrams. Point size increases as intensity increases, to better show the high flux area.

In the diagram we only show flux greater than $10kW/m^2$, from 10 meters (33 feet) to 230 meters (755 feet) in height; therefore, the diagram becomes relevant only at 400 meters (1,312 feet). We used a $10kW/m^2$threshold since it is the maximum permissible exposure (MPE) for the human eye. The raw data used for this model are: time (year, month, day, hour, minute, sec.), geographic data (longitude, latitude, altitude), and heliostat beam shape.

For the modeling, the SRSG is shown in full load demand (maximum flux requirements). In the model images shown in the figures, a 1-meter by 1-meter grid was used, with one point in each grid point (i.e., a 1-meter resolution). The cylindrical area around the SRSG was modeled and computed the flux as the flux emitted normal to the surface. The cylinders started at 20 meters (66 feet) from the center of the SRSG (about ~4 meters [13 feet] from the SRSG face) with 10-meter (33 –foot) increments until 100 meters (328 feet), 50-meter (164-foot) increments to 200 meters (164 feet), and 100-meter increments until 1,000 meters (3,281 feet). Cylinder height started at 10 meters to 230 meters.

The side views show the highest value projections: note that views from the north and south are mirror images (as are those from east and west). Figure DR161-1 (figures are at the end of this data response) provides a 3-D view of the model output.

Figure DR161-3 shows that only a small area of the plant has flux above 10kW/m2; therefore, we chose to present the figures in a zoom-in mode when viewing only areas with flux above the relevant intensity (i.e., Figure DR161-5 and Figure DR161-5).

Side views (Figure DR161-3, Figure DR161-4, and Figure DR161-5) show that the flux is limited to a cone-shaped area. The high intensity flux is limited to a small area (in width and height).

Flux densities with values greater than 200kW/m^2 start at 35 meters (115 feet) from the SRSG surface (50 meters from the center) on a small area (~18 meters (59 feet) wide and ~5 to 6 meters (16 to 20 feet) high (see Figure DR161-6, Figure DR161-7, and Figure DR161-8).

Above 400kW/m^2 the flux is limited to the following:

- 4 meters (13 feet) from the SRSG surface, and
- A small area starting 15 meters (49 feet) from the SRSG, with a width of 10 meters.

DATA REQUEST

162. The plan view of the flux map prepared for the proposed Rio Mesa Solar Project (BrightSource Energy presentation at January 6, 2012 staff workshop, tn 63357, page 26), specifies a flux pattern at a certain wind condition, *e.g.*, 7 m/sec (15 mph). Shape indicates that wind effect acts to compress the area of influence. Conversely, still air conditions would extend the area of influence. Please confirm that the plan and elevation views represent the same wind conditions and provide the respective profiles for still air. Please indicate if these profiles represent conditions consistent with Applicant's attachments [figures] DR57-2, DR57-3 and DR57-4 (provided as part of applicant's response to Data Request #57) discussed below.

Response: The plan view of the flux map prepared for the proposed Rio Mesa Solar Project (BrightSource Energy presentation at January 6, 2012 staff workshop, tn 63357, page 26), specifies a flux pattern. This pattern is not affected by the wind velocity; therefore, it will remain the same for any wind velocity (including still air).

These profiles are different from the conditions in Attachment DR57-1, which simulates the temperature of the air at the vicinity of the SRSG for still air. The purpose of the analysis in Attachment DR57-1 was to examine the effect on the secondary mirrors.

DATA REQUEST

163. Please discuss the possibility of preventing bird collisions with heliostats by randomizing the angle of heliostats during sleep position. Discuss any glint/glare effects this operational approach might have on other sensitive human or wildlife receptors, and whether (and how) identified impacts could be mitigated or minimized, and in what fashion.

Response: Applicant is unaware of any studies, literature, or reports supporting the supposition that the angle of heliostats in the sleep or safe positions will result in bird collisions. Based on operational experience at the Solar Energy Development Center ("SEDC"), birds do not collide with the heliostats, whether sleep-oriented or operational. In the absence of any evidence of collisions, the need for any plan or program to randomize the orientation of the heliostats would be purely speculative. Moreover, the sleep position has different azimuthal orientation for different heliostats and is designed to reduce glint from the mirrors; therefore, the reflected light and the heliostats' appearance from the sky view will not be uniform. Given that the Project design already incorporates a varied azimuthal orientation for heliostats in the sleep position, any potential impacts to sensitive human or wildlife receptors have already been addressed in the AFC and previous data responses to Staff. As Applicant has stated in Data Responses 29 and 37, there are no significant impacts to humans or wildlife as a result of either glint or glare from the Project.

Finally, the use of the term *"sensitive human or wildlife receptors"* in Data Request 163 is inappropriate. A sensitive receptor is a term of art in CEQA referring to acutely sensitive human receptors such as schools or medical facilities. CEQA does not recognize wildlife as a "sensitive receptor" for the purpose of determining significant environmental impacts.

BACKGROUND

Data Request Set 1B requested data on ambient temperatures at the solar tower, as projected by modeling. Applicant's response to Data Request #57 included Attachment DR57-4, "Expected Temperature Drop of the SRSG Panels After Shutdown (at 30°C ambient)". Staff requests clarification of Attachment DR57-4 as follows.

DATA REQUEST

164. Please provide the name of the model used to generate data outlined in Data Response #57 (part of Applicant's Data Responses, Set 1B, tn 63056, filed on 12/5/2011).

Response: The model used to generate Figure DR57-4 (in Attachment DR57-1) is ANSYS Fluent software.

165. Please confirm the accuracy of the data presented in Attachment DR57-4. Please also provide a description of assumptions used in creating this data, and explain the X axis variables, "Eva panels" and "SH panels". The steam cycle in AFC Figure No: 2-4-1 specifies a requirement for generating steam to a superheat of 585°C (1,085°F) and Figure DR57-4 shows a surface temperature of 425°C (887°F) at the SH panels and 325°C (617°F) at the Eva panels.

Recognizing that the saturated steam temperature at 100 bar (1,460 psia) is 311°C (592°F), please demonstrate how heat transfer up to the superheated condition is attained. Please consider performing a heat balance on the solar cycle similar to the conventional steam cycle heat balance. Include absorbance, transmittance and reflectance factors for the heliostats and tower receiver, effective collector and receiver areas, and design basis solar insolation and intensities that deliver 270 MW to the steam generator.

Response: The analysis used in developing Attachment DR57-4 is typically used for an initial evaluation. Like any initial evaluation tool, the results set forth in Attachment DR57-4 are dependent upon on the assumptions used as modeling inputs. The assumptions used in creating this data were: constant wall temperature (for the Eva and SH panels) and weather conditions (e.g., wind velocity and temperature). The Eva and SH panels are boiler panels.

"Eva " is short for evaporation. Thus, the Eva panels refer to those affecting the phase change from liquid to gas (i.e., water to low quality steam).

"SH" is an abbreviation for super heater. Thus, the SH panels are those that produce the drier superheated steam.

Figure DR57-4 shows the correct value for SH panel surface temperature as 475°C (887°F). Within the boiler (see Figure DR57-2 (Data Response Set 1B), the SH panels (29.5 feet long) are located just above the Eva panels (36 feet long). The chart reflects a cooling period. The initial condition was not full maximum continuous rating, but partial loading.

Heat transfer up to the superheated condition is attained as follows: The boiler feedwater enters the SRSG from the Eva section, where it circulates with saturated water, obtaining

both sensible and latent heat, and is sent to the SH section as saturated steam (311C @ 100bar).

TABLE DR165-1
Heat balance of the Solar Cycle

Parameter	Value
Receiver Absorption	95%
Reflectance of Tower Receiver	5%
Transmittance Heliostat-> Receiver	95% at 1km
Reflectance of Heliostats	90-93%
Effective Collective Area	For 90,000 heliostats 1,704,600 sq. meters (~5,592,520 sq. feet)
Effective Receiver Area	1920 sq. meters (~20,639 sq. feet)
Solar Insolation Required for 270MW (gross)	800-850 watts/sq. meter

BACKGROUND

Section 5.2.7.6.3 of the AFC discusses potential project impacts to migratory and resident birds. The discussion outlines impacts from project construction and project demolition, and states that collisions with vehicles and equipment, noise impacts, and loss of habitat are potential impacts of construction of the project. However, the discussion does not include potential operational impacts of solar reflectance on avian species. Staff has concerns regarding potential injury or even death of birds resulting from singeing, burning, or eye damage from moving through solar reflectance. Staff is currently unable to analyze potential impacts of solar flux on avian species due to lack of data. Staff needs to understand the tolerance of solar flux by avian species, potential avian tolerance thresholds of species expected to be at the site, and determine whether operation of the project will adversely impact avian species. If impacts are identified, staff will then need to analyze mitigation and conservation measures appropriate to the impact and applicable laws, ordinances, regulations, and standards (LORS).

DATA REQUEST

167. Please identify the solar flux tolerance thresholds where birds may be injured or singed in any capacity (vision, skin, plumage damage, or other impact)

168. Provide a discussion of predicted fatality rates for each species or species group over the life of the project, based on determined tolerance thresholds. Provide predicted fatality rates for each special status species potentially occurring in the area, as well as for passerines and raptors. Describe how flight speed, surface area-to-volume ratio, and plumage color would affect avian species known to occur and/or migrate over the site, as well as any other variables that could affect fatality rates. Please also describe the predicted rates of non-fatal injuries for each special status species potentially occurring in the area, as well as for passerines and raptors.

169. Provide a discussion of how seasonal variation and weather conditions might affect fatality rates. Discuss how seasonal variations and weather conditions could affect these non-fatal injury rates.

170. Provide a discussion of fatality rates compared between breeding and non-breeding seasons, and discuss the degree of accuracy in the predicted fatality rates. Please also provide a discussion of how non-fatal injury rates would be expected to compare between breeding and nonbreeding seasons, and discuss the degree of accuracy in the predicted non-fatal injury rates.

Response to Data Requests 167 through 170: The McCrary et al. (1986) study concluded that death after being burned in standby points at the Solar One facility was infrequent in occurrence. Given that the HHSEGS Project will employ a new technology that directs reflected light in a diffuse pattern, energy concentration at HHSEGS will be a fraction of that at Solar One. Operational safety procedures that preclude standby points of concentrated solar flux are expected to avert the risk of injuring, singing or burning birds. Consequently, the only area of concentrated flux will be near the surface of the solar receiver. It is expected that birds will avoid this area as they alter their flight paths to avoid striking the highly visible tower. This expectation is supported by the experience of BrightSource Energy in operating the SEDC facility with the same safety procedures. At that facility, no avian fatalities have been found during daily site inspections. This is the best data available since no additional information is known to be available from any comparable facility operated under the same safety procedures. Therefore, calculation of solar flux tolerance thresholds and fatality rates for individual species or species groups is not necessary.

DATA REQUEST

171. Please describe the project's conformance with the Federal Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and Fish and Game Code (Sections 355 – 356, 3513, 3511, 4700, 5050, and 5515) relative to the project's projected non-fatal and fatal injury rates. Please describe measures that applicant would implement to insure impacts are mitigated to less than significant and the project complies with LORS.

Response: In Applicant's March 28, 2012 letter, the Applicant objected to this data request as vague, and potentially not relevant given the underlying premises of the request. Without waiving this objection, Applicant provides the following response.

Migratory Bird Treaty Act (16 USC §§703-712; 50 CFR §10)

During operations, fatalities of migratory birds are not expected. Operational safety procedures that preclude standby points of concentrated solar flux are expected to avert the risk of injuring, singing or burning birds. Consequently, the only area of concentrated flux will be near the surface of the solar receiver. It is expected that birds will avoid this area as they alter their flight paths to avoid striking the highly visible tower. This expectation is supported by the experience of BrightSource Energy in operating the SEDC facility with the same safety procedures. At that facility, no avian fatalities have been found during daily site inspections. This is the best data available since no additional information is known to be available from any comparable facility operated under the same safety procedures.

In addition, the project owner will implement an Avian and Bat Protection Plan (ABPP). It will include a monitoring program to detect avian mortalities, an employee awareness component and an adaptive management procedure. If avian mortalities are detected, then adaptive management practices will be implemented, in cooperation with the resource agencies, to identify and eliminate or mitigate to a less-than-significant level any risk to migratory birds. The purpose of the ABPP is to avert or detect avian and bat mortality and to

provide a mechanism for the project owner to voluntarily implement specific commitments to address interactions of concentrating solar operations and wildlife interactions.

Bald and Golden Eagle Protection Act (16 USC §668; 50 CFR §22 et seq.)

During operations, fatalities of golden eagle are not expected for the reasons described above for migratory birds. A Golden Eagle Study Plan (GESP) was submitted as Attachment DR51-1 (Data Response Set 1B) and is being implemented. The explicit purpose is to collect data needed to provide a mechanism for the Applicant to voluntarily implement specific commitments to address interactions of concentrating solar operations and golden eagles. Similar to the ABPP, an Avian Protection Plan for Golden Eagles will be prepared.

Fish and Game Code Sections 355 – 356

In accordance with the Migratory Bird Treaty Act, California provides additional protection for migratory birds, their nests and eggs by designating areas, seasons, and hours of hunting, as well as bag and possession limits for each species of migratory game birds. Migratory game birds will be protected by the measures implemented to protect all MBTA species as detailed in Section 5.2.9 of the AFC and the ABPP described above.

Fish and Game Code Section 3511

The only fully protected bird species listed in this section that has been identified on the site is the golden eagle. Golden eagles will be protected by the same measures applied pursuant to the Bald and Golden Eagle Protection Act described above.

Fish and Game Code section 4700

Within the project area, the Nelson bighorn sheep (*Ovis canadensis nelsoni*) is the only fully protected mammal listed in this section. It occurs in mountainous areas within the region. Due to habitat restraints, this species has very low probability of occurrence on the project site. The project owner will avoid take of fully protected species by implementing avoidance and protection measures described in Section 5.2.9 of the AFC.

Fish and Game Code Section 5050

None of the fully protected reptile or amphibian species listed in this section has potential to occur on the site.

Fish and Game Code Section 5515

None of the fully protected fish species listed in this section has potential to occur on the site.

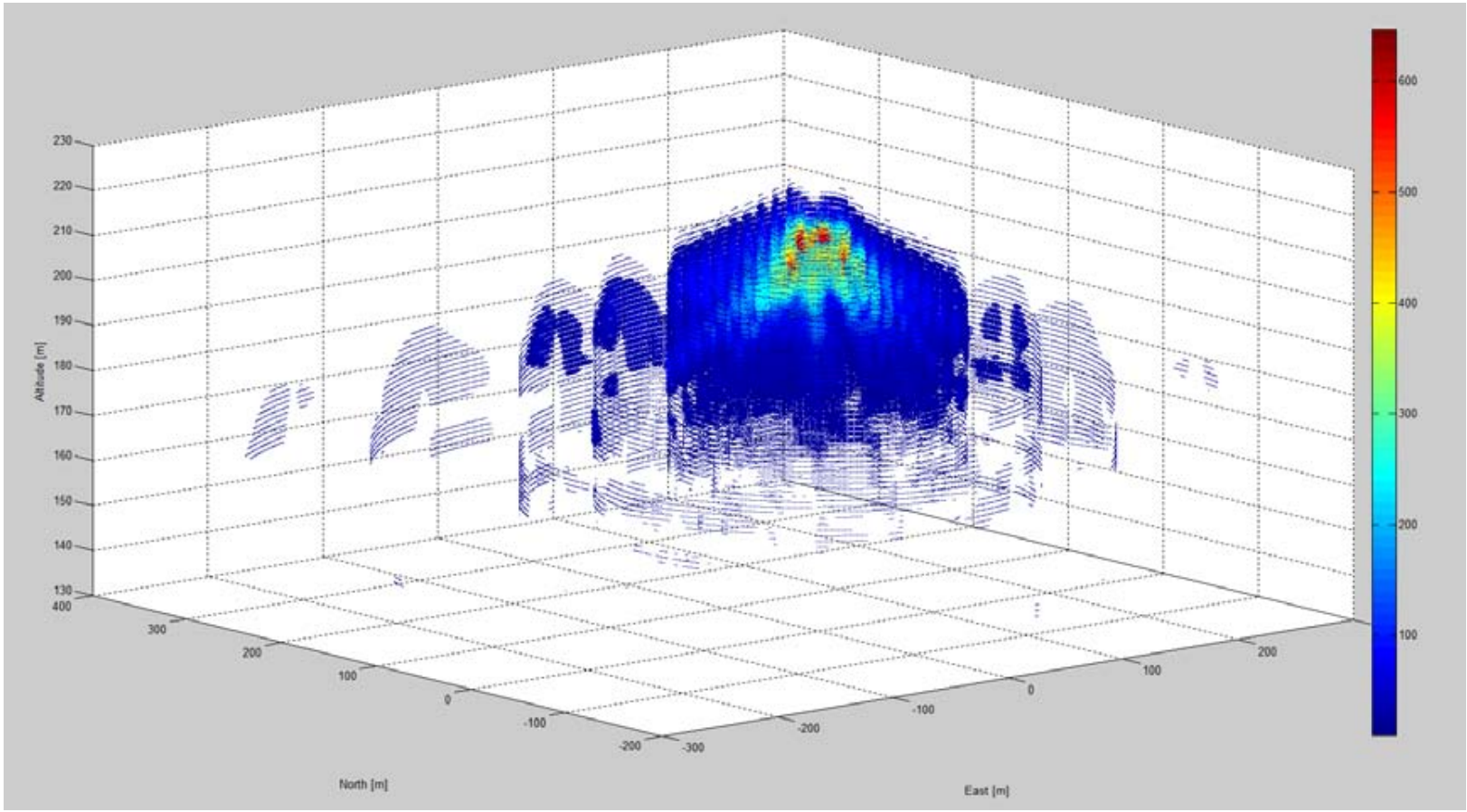

FIGURE DR161-1
3-D Flux Map Model on Cylindrical Area in the Solar Field at Maximum Load (Maximum Flux Requirement), Flux Density >10 kW/m²

Hidden Hills Solar Electric Generating System

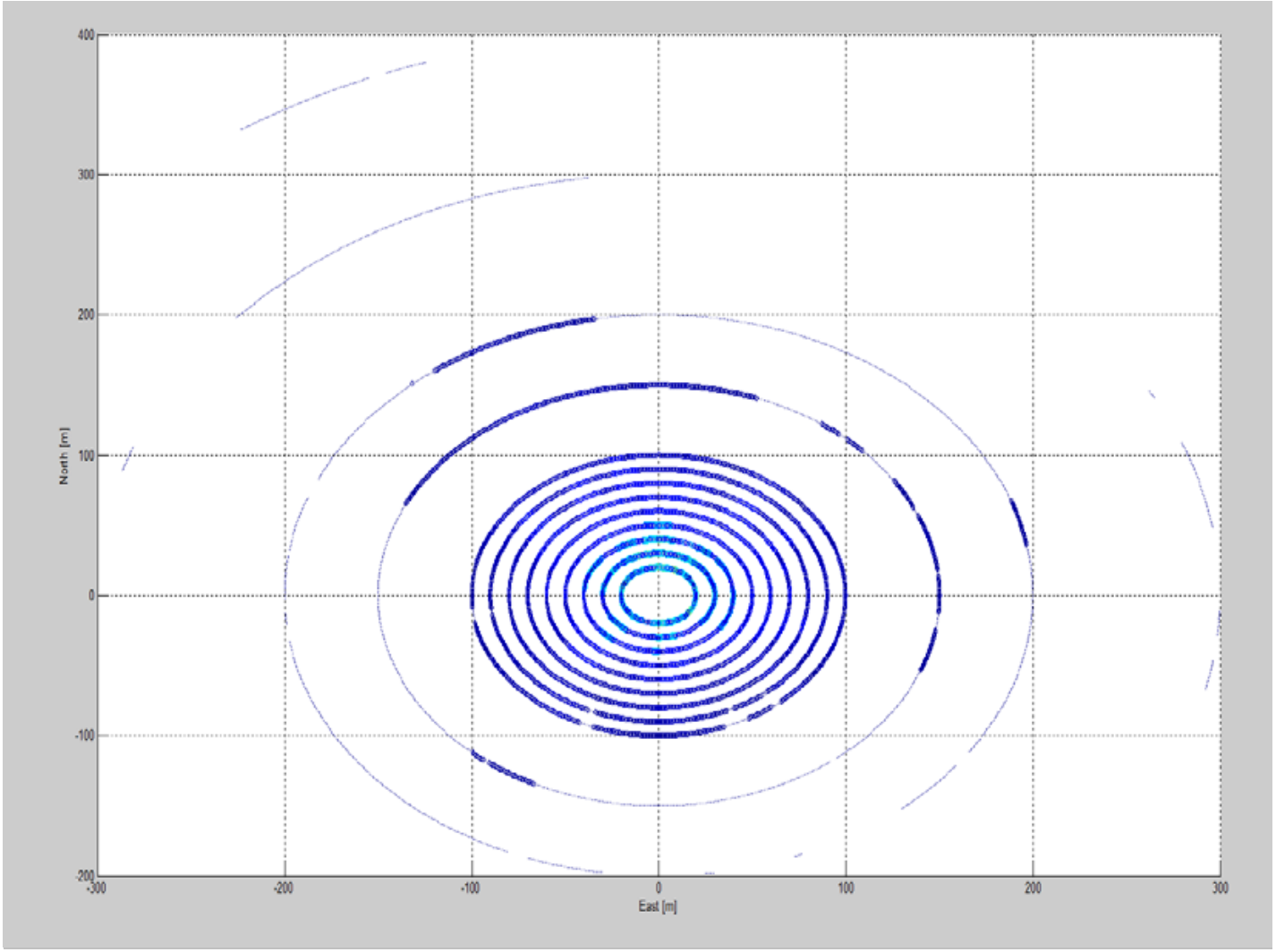

FIGURE DR161-2
Top View of the Cylindrical Flux Model, Flux>10kw/m². One Can See that the Flux is only Greater Than 10kw/m² at 380 Meters (1,247 Feet) from the Center and for a Limited Area.
Hidden Hills Solar Electric Generating System

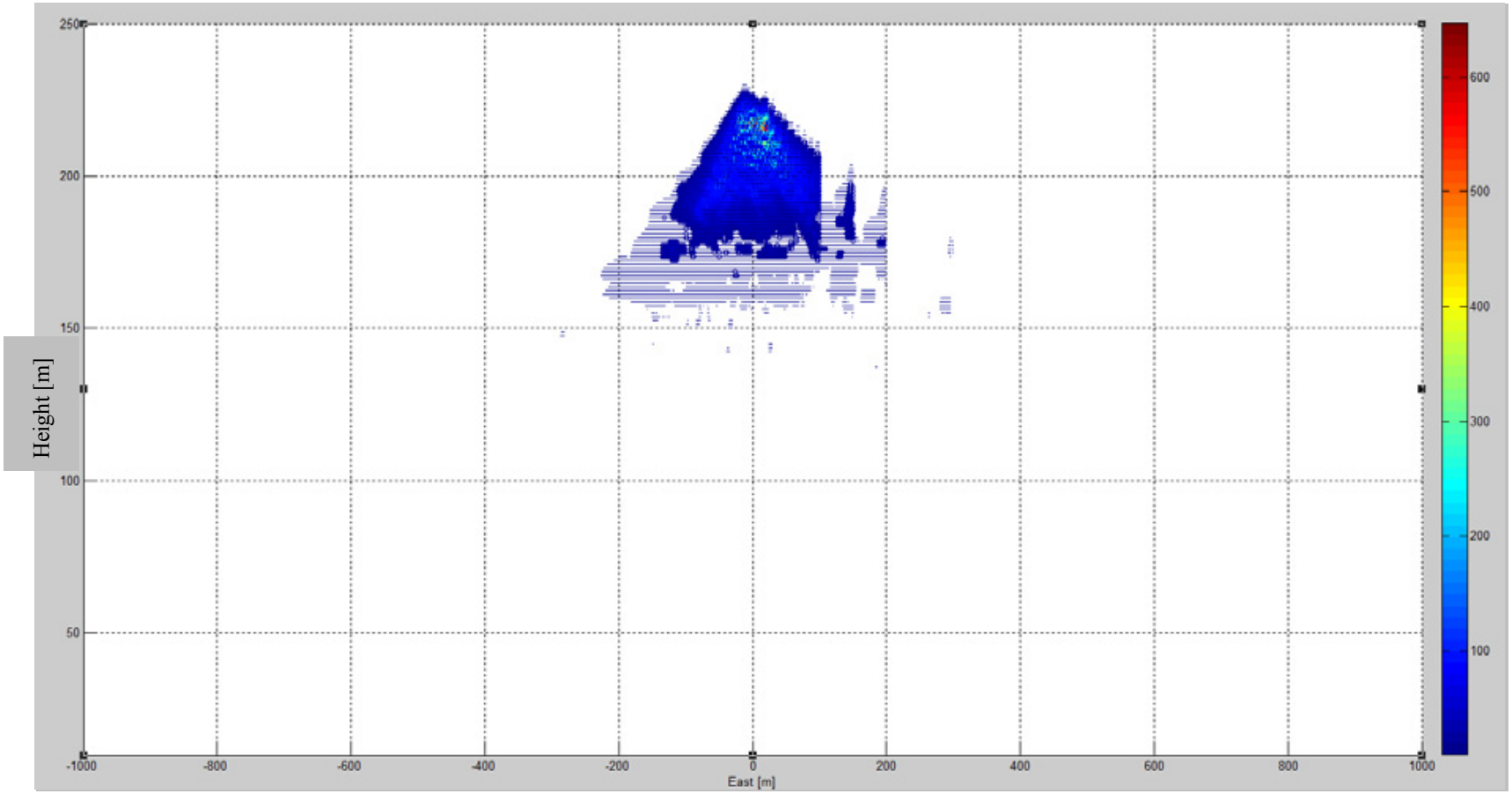

FIGURE DR161-3
Side View from North; X Scale is 1,000 Meters and Z scale from 10 meters to 250 meters. Note that the Flux is Concentrated only in a Small Area.

Hidden Hills Solar Electric Generating System

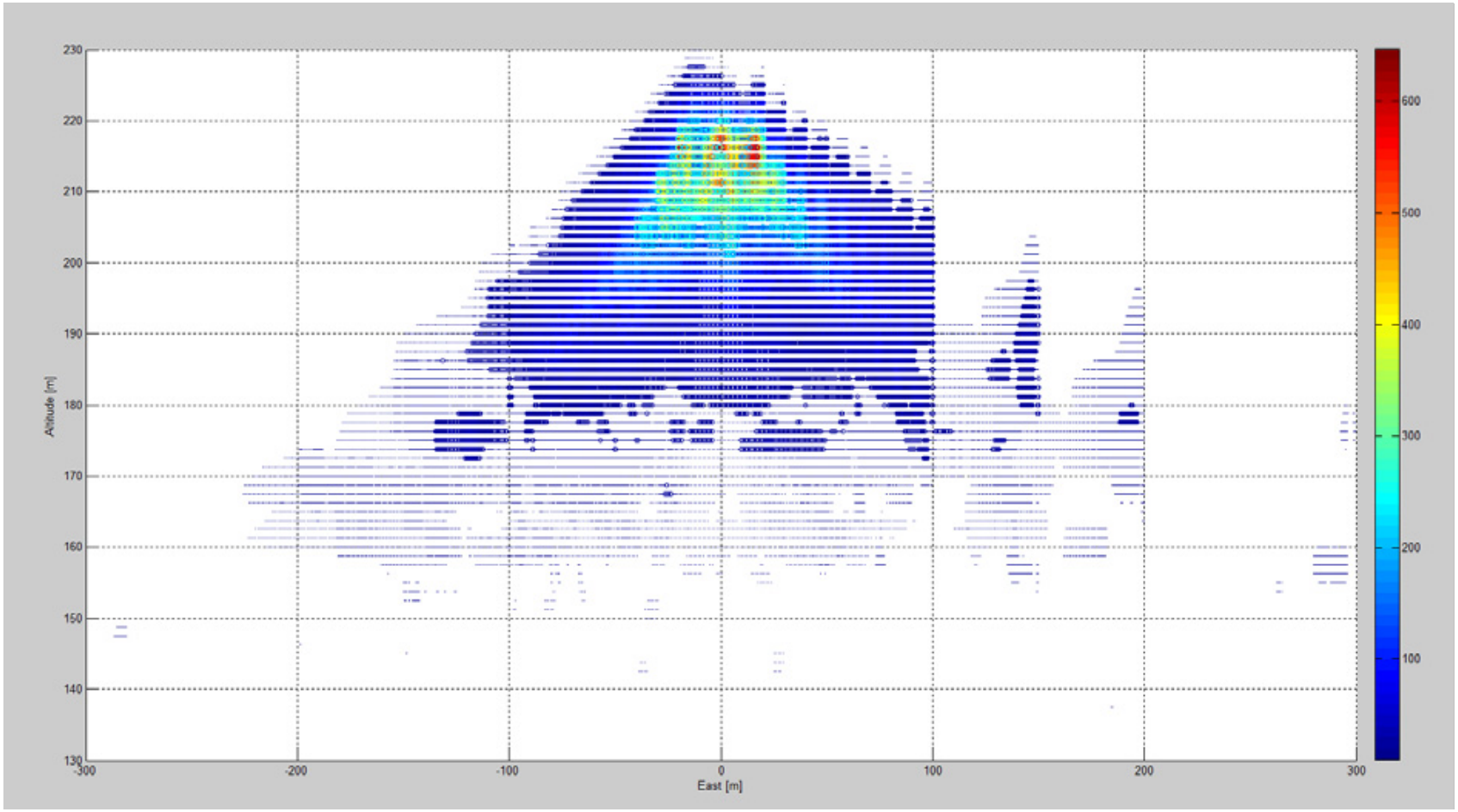

FIGURE DR161-4
Side View from North; Thick Blue Represents Flux over ~50kW/m²

Hidden Hills Solar Electric Generating System

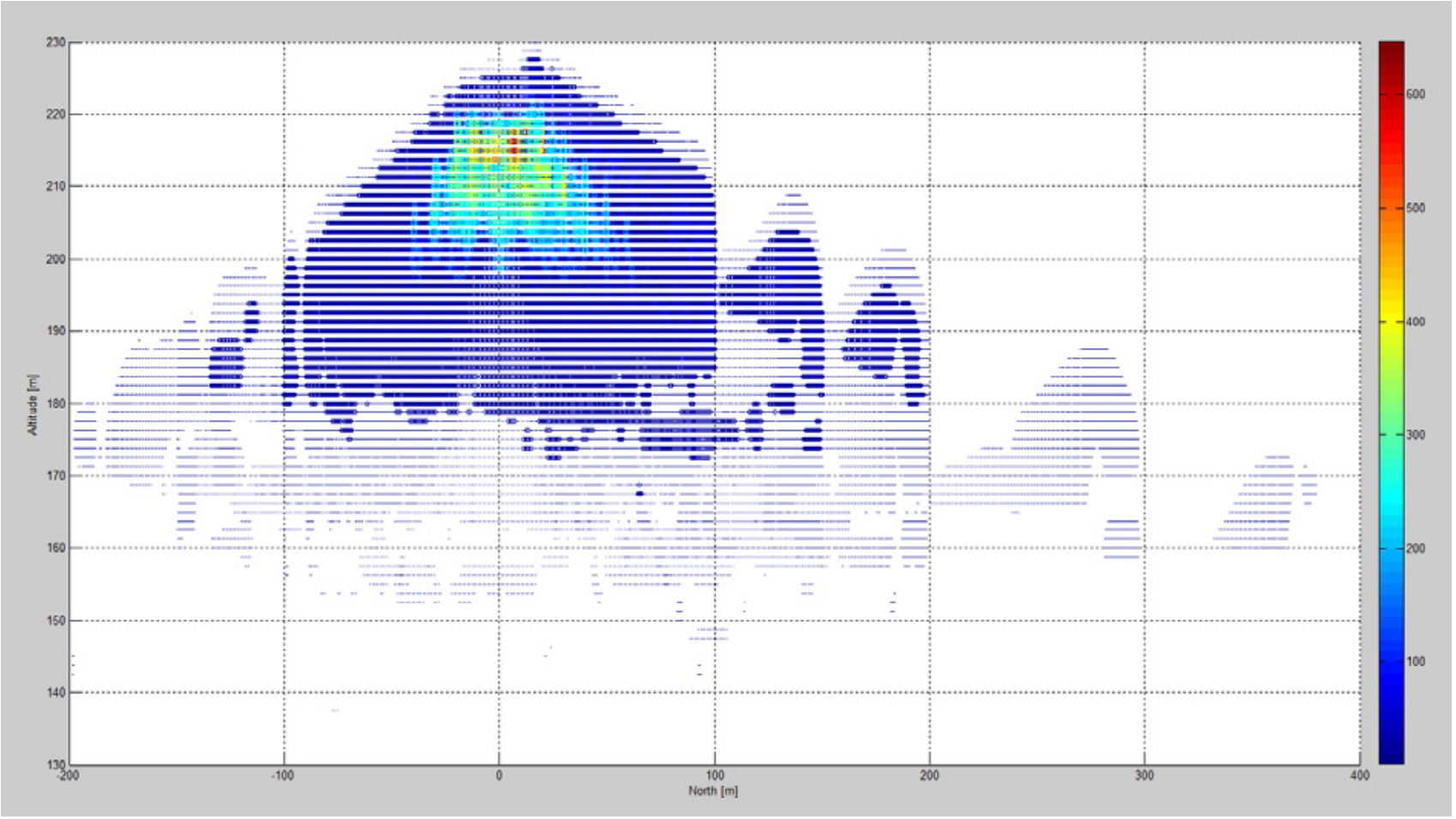

FIGURE DR161-5
Side View from the East; Thick Blue is Flux Over ~50kW/m²

Hidden Hills Solar Electric Generating System

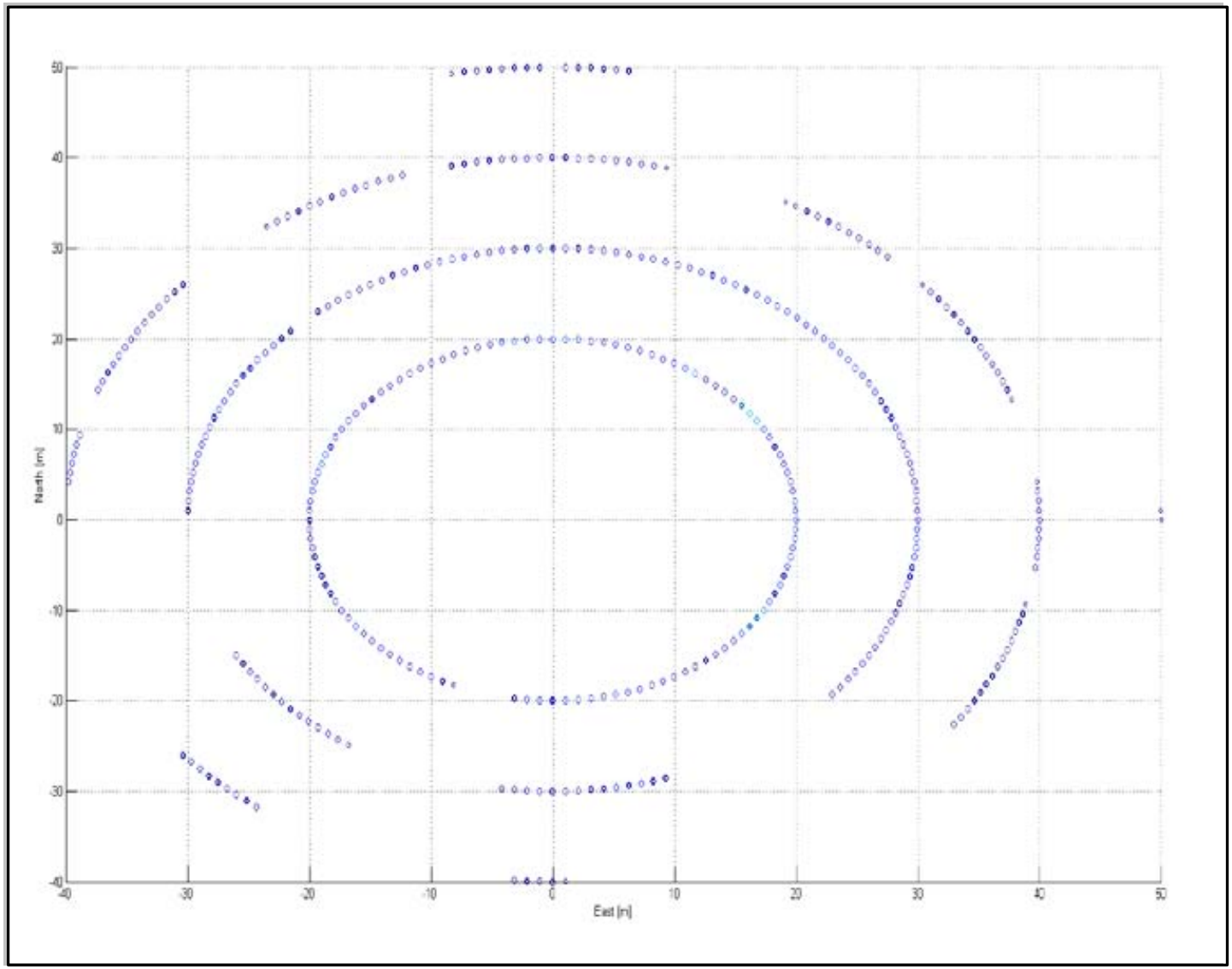

FIGURE DR161-6
Top View; Flux 200 kW/m²
Hidden Hills Solar Electric Generating System

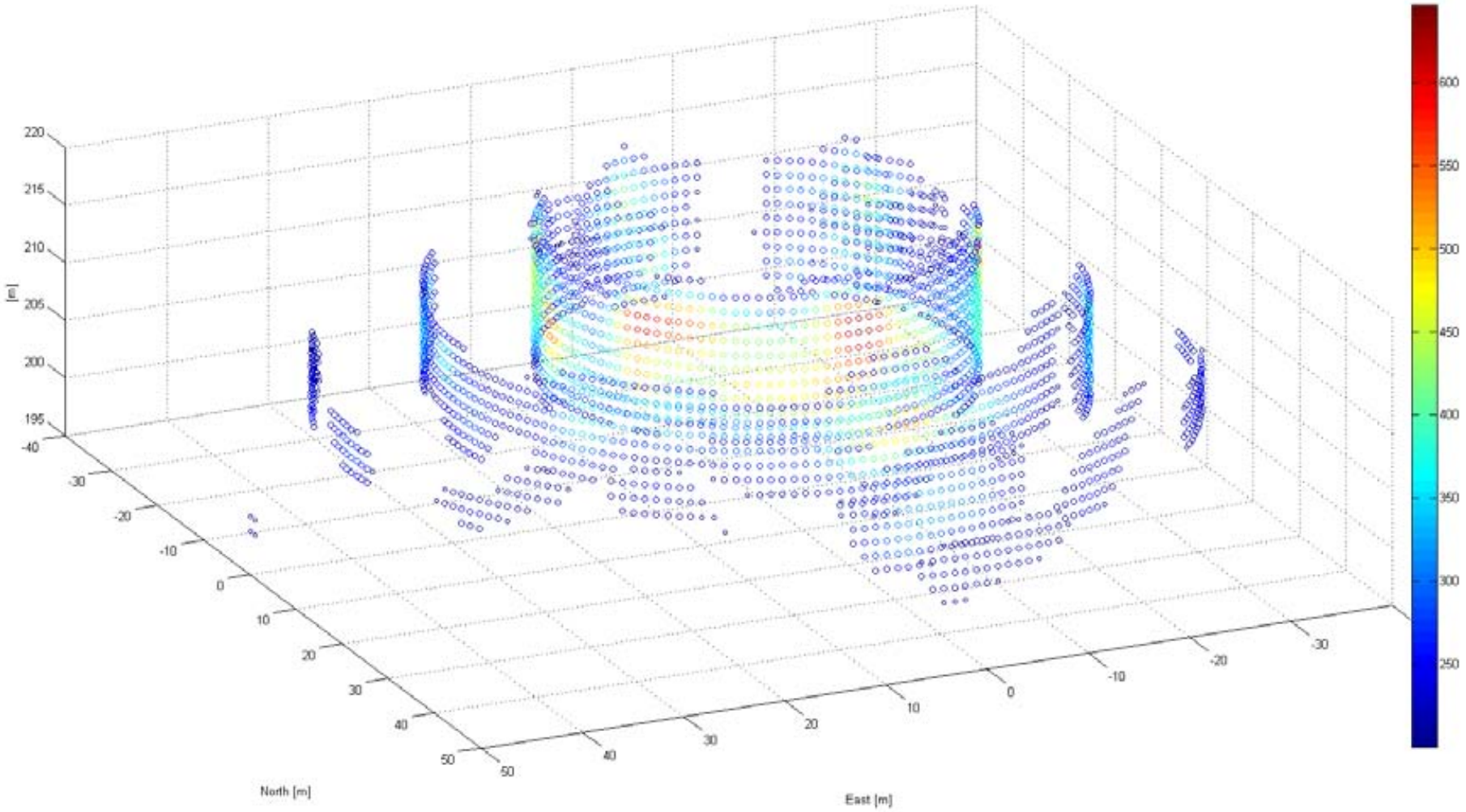

FIGURE DR161-7
Flux Above 200kW/m². The Area of Flux Above 200 kW/m² is Limited, and the Areas of 450 kW/m² (Yellow) and Over 500 kW/m² (Orange to Red) are Very Small.
Hidden Hills Solar Electric Generating System

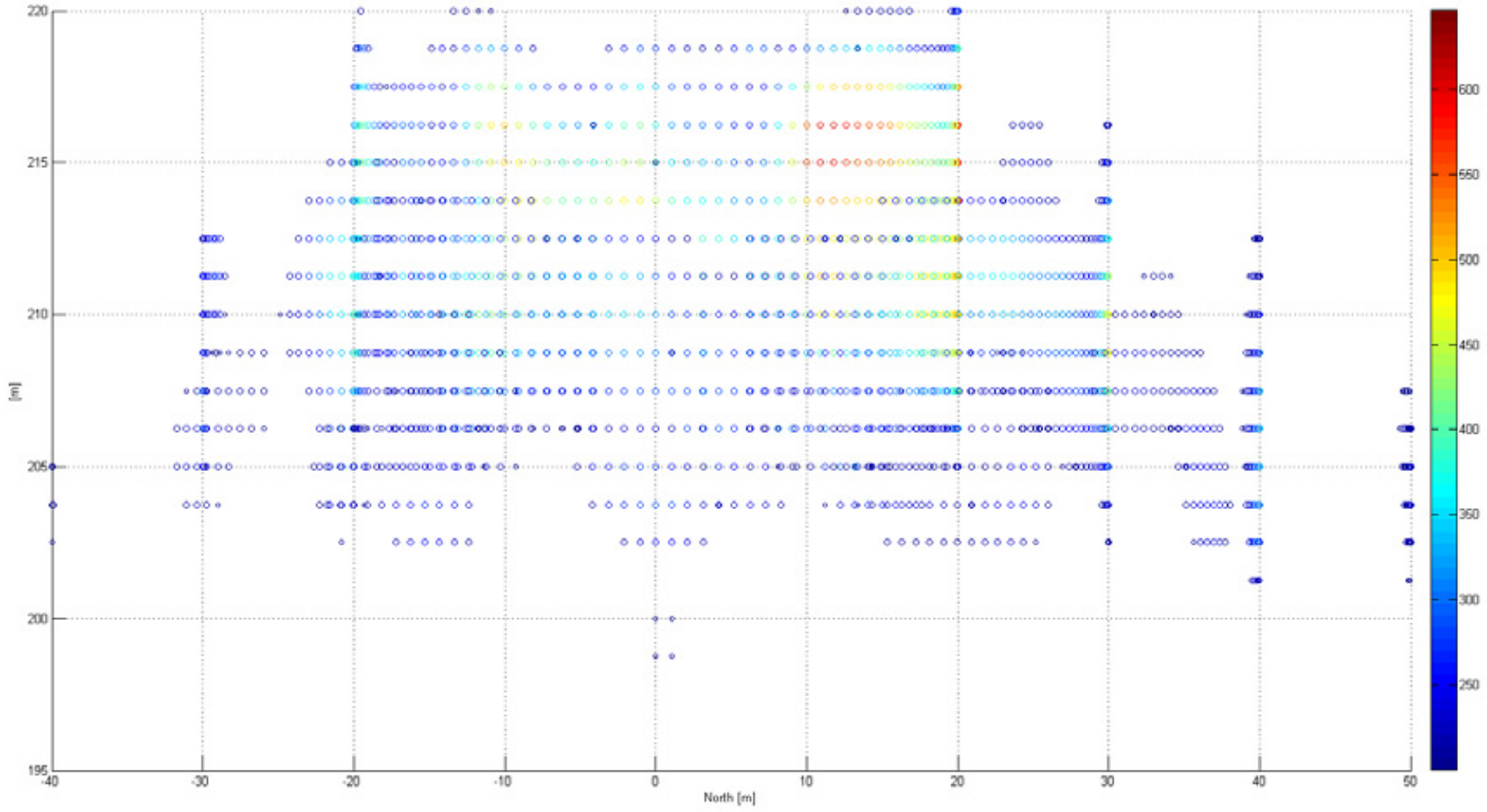

FIGURE DR161-8
Side View from the East; Flux > 200kW/m².
Hidden Hills Solar Electric Generating System

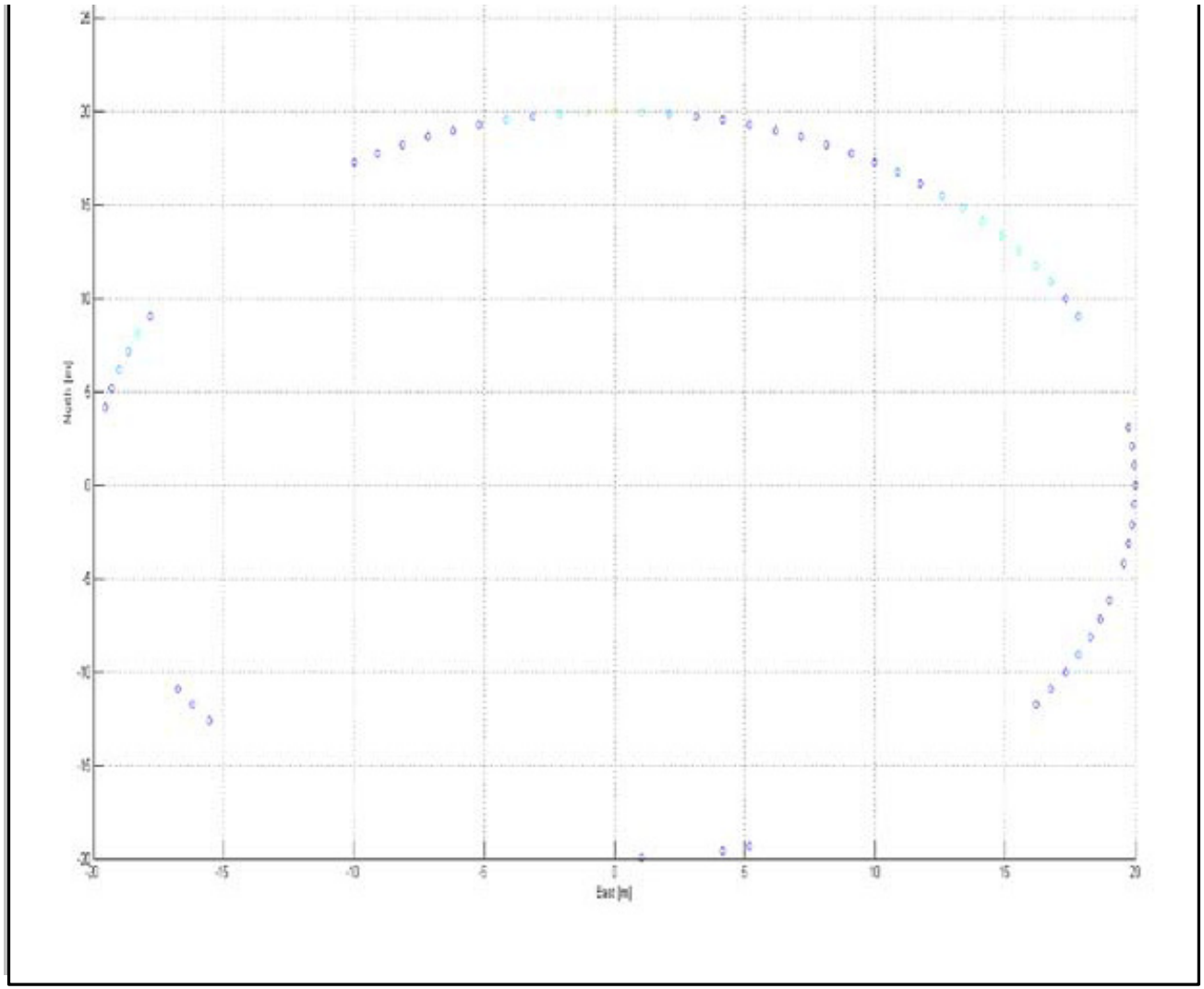

FIGURE DR161-9
Top View of Flux > 400 kW/m². Concentrated Flux Starts Mainly at 4 Meters from the SRSG (20 Meters from Center Point).
Hidden Hills Solar Electric Generating System

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
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1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
FOR THE *HIDDEN HILLS SOLAR ELECTRIC GENERATING SYSTEM*

DOCKET NO. 11-AFC-2

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(Revised 3/22/2012)

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DECLARATION OF SERVICE

I, John L. Carrier, declare that on April 16, 2012, I served and filed copies of the attached Hidden Hills SEGS Data Response, Set 2D-2, dated April 16, 2012. This document is accompanied by the most recent Proof of Service list, located on the web page for this project at: www.energy.ca.gov/sitingcases/hiddenhills/index.html.

The document has been sent to the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit or Chief Counsel, as appropriate, in the following manner:

(*Check all that Apply*)

For service to all other parties:

__x__ Served electronically to all e-mail addresses on the Proof of Service list;

____ Served by delivering on this date, either personally, or for mailing with the U.S. Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses NOT marked "e-mail preferred."

AND

For filing with the Docket Unit at the Energy Commission:

__x__ by sending an electronic copy to the e-mail address below (preferred method); *OR*

____ by depositing an original and 12 paper copies in the mail with the U.S. Postal Service with first class postage thereon fully prepaid, as follows:

CALIFORNIA ENERGY COMMISSION – DOCKET UNIT
Attn: Docket No. 11-AFC-2
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

OR, if filing a Petition for Reconsideration of Decision or Order pursuant to Title 20, § 1720:

____ Served by delivering on this date one electronic copy by e-mail, and an original paper copy to the Chief Counsel at the following address, either personally, or for mailing with the U.S. Postal Service with first class postage thereon fully prepaid:

California Energy Commission
Michael J. Levy, Chief Counsel
1516 Ninth Street MS-14
Sacramento, CA 95814
mlevy@energy.state.ca.us

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

John L. Carrier, J.D.
Program Manager
CH2M Hill