SMART GRID

Pilot Solar Energy Study

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Introduction

Solar insolation modeling is used by many entities around the world to estimate the potential for rooftop solar power generation. Rocky Mountain Power's GIS Solutions group performed a solar insolation study to support ongoing Rocky Mountain Power Smart Grid planning in the Salt Lake City area.

This study identifies rooftops which are estimated to meet the minimum criteria for acceptable area and annual solar radiation received to allow for the installation of solar panels.

According to the National Renewable Electricity Laboratory (NREL), Salt Lake City is estimated to average between 5 and 5.8 kilowatthours per square meter per day (kWh/m²/day.) NREL's estimate considers direct normal insolation modeled across a 10-degree grid for the entire United States. The model input values are taken from insolation measurements provided by a network of hundreds of meteorological stations. In Utah, Salt Lake County insolation potential is considered just above average. Solar insolation intensity increases with southward direction. Figure 1shows NREL's annual solar potential map for Utah.

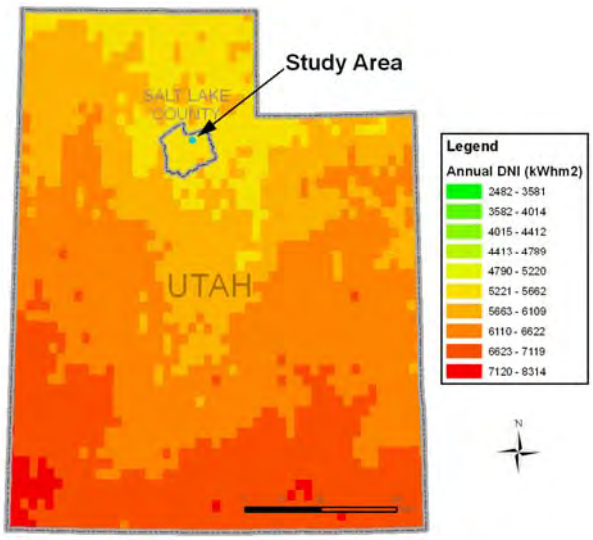

Figure 1: NREL Direct Normal Insolation 10-Degree GRID for Utah (kW/h/m²).

Factors such as slope, aspect, shading, changing solar positions, and weather conditions must be considered in order to generate useful estimates for individual roof surfaces. Rocky Mountain Power's GIS Solutions team has developed monthly solar insolation models using the ArcGIS Area Solar Insolation tool. The model was developed using recently collected high-resolution LiDAR data. This approach yields high-resolution results that identify which roof faces have the best characteristics for installation of photovoltaic (PV) panels based on roof slope, shading, area, sky conditions (clear, cloudy and partly cloudy), and estimated solar insolation. Our model's input values were calibrated against measured solar insolation values published by a NOAA weather station located fewer than 25 kilometers from the study area.

The study area includes those customers served by the Northeast #16 distribution circuit. This area comprises two neighborhoods representing a mix of business, institutional, and commercial land uses near the University of Utah (see Figure 2). The 51-acre area closest to the

University of Utah covers seven blocks bounded on the east by University Street, on the west by Elizabeth Street and 1200 East, on the north by 200 South, and on the south by 300 South and 400 South. A 16-acre area to the west covers two full blocks and one partial block, with the northern two blocks bounded by 1000 East to the east, 300 East to the west, South Temple Street to the north, and 100 South to the south. The partial block in this area is bounded by 1000 East to the east, Lincoln Street to the west (the boundary does not extend as far west as the street), 100 South to the north and 200 South to the south.

While only roofs within the study area were evaluated for solar potential, modeling was performed on a larger area incorporating a 250-foot buffer to account for potential shading effect of large trees or buildings adjacent to the pilot study area.

The study area encompasses 356 buildings on 290 tax lots which range in size from 89.3 square meters to over 4,645 square meters (1.15 acres).

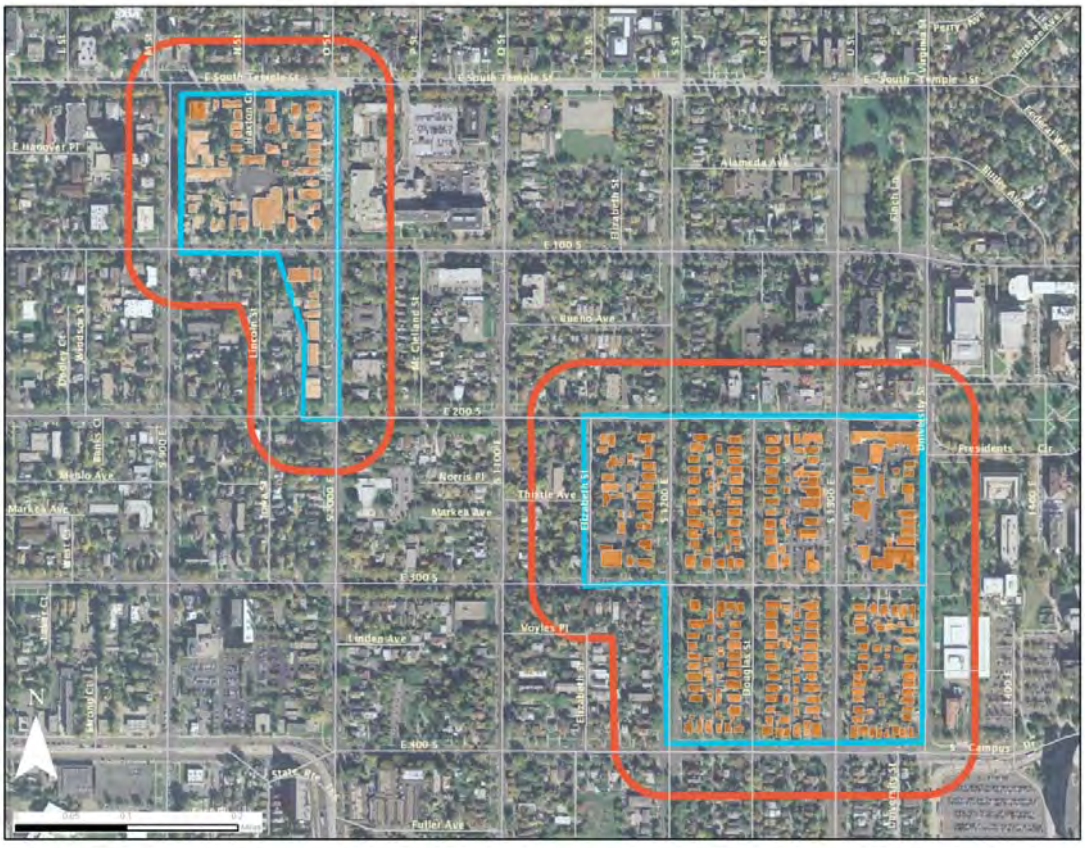

Figure 2: Pilot Study Area

Up-to-date parcel data was obtained from the Salt Lake County Assessor's Office in December 2010. Relevant data obtained for this study from the parcel dataset included site addresses, owners contact information, and parcel land use. The land use configuration for the study area is shown in Table 1.

Land Use	# of Buildings
10-19 Unit Apartment	5
3-4 Unit Apartment	6
5-9 Unit Apartment	3
Apartment 20-49 Units	2
Apartment Conversion	5
Bank	2
Church	3
Church Or Public	2
Condominium Timeshare Common Area	2
Condominium Unit	2
Convenience Store	1
Duplex	12
Fast Food Restaurant	1
Fraternity/Sorority	1
Medical Office	2
Mixed Retail	4
Multiple Residential	15
Nursing Hospital	2
Office	2
Office Conversion	2
Other Exempt	2
Residence Imps On Comm Land	1
Restaurant	4
Retail Store	3
Single Family Residential	151
Unknown	9

Table 1: Number of buildings per land-use type

Methods

ESRI's Area Solar Insolation tools were used to build the Cloud-Based-Model that calculates estimated insolation for the study area for an entire year. Inputs to the model included the corrected LiDAR derived digital elevation model, temporal parameters, and atmospheric modification factors based on local climate.

The model's output is a raster grid that retains the 0.61 square meter resolution of the input elevation model, in which each pixel represents the monthly estimated insolation for that location. These values were used to generate an average daily insolation value based on one square meter.

After extensive sensitivity testing, it was determined that the best temporal configuration was to calculate monthly insolation totals based on 24 hour sun position changes over 14-day time steps with half-hour intervals. A total of 32 directions, zenith divisions, and azimuth divisions were used to track the position of the sun in the sky, and to calculate the variance of diffuse radiation. Because computing time was not an issue, a standard-overcast-sky diffuse model was chosen over a uniform sky model. This allowed the model to calculate diffuse radiation variability based on zenith angles. Climate considerations were incorporated using the cloud-based insolation modeling approach described in the next section.

Roof polygons were derived from LiDAR data and used to estimate the amount of area available to accommodate typical 1.42 meter by 0.66 meter (56″ by 26″) photovoltaic solar panels, given their shape, aspect, shading characteristics, and rooftop objects such as chimneys.

The final analysis combined all of the model's outputs and building data to assess the estimated amount of insolation per rooftop and per PV panel for different time periods.

Cloud-Based Insolation Model

Diffusion refers the percentage of insolation that is received indirectly after passing through the atmosphere. Transmissivity refers to the percentage of insolation that directly reaches a flat surface after passing through the atmosphere.

ESRI's Area Solar Insolation toolset single diffusion and transmissivity values were entered for the time period being evaluated. According to ESRI's documentation a transmissivity value of 0.6 to 0.7 should be used for very clear sky conditions, and 0.5 is optimal for generally clear sky conditions. Diffusion values are inversely proportional to transmissivity and for very clear sky conditions it is recommended to use a diffusion value of 0.2.

Diffusion and transmissivity factors are directly dependent on atmospheric conditions. In the study area cloud cover varies from month to month. It was important to include these atmospheric variations in the model. Three models were run in parallel for each month in order to model these variations.

The first model calculated potential daily average solar power under clear sky conditions for any given month. The second model calculated the potential daily average solar power under partly cloudy skies. The third model performed the same calculation for cloudy days.

Each monthly total insolation then became a function of the ratio of clear, partly cloudy, and cloudy days within that month. For example, December has 31 days. If, on average, six days are clear, 18 days are partly cloudy, and 7 days are cloudy, the total monthly insolation for December would be:

6x + 18y + 7z = Total Monthly Insolation

Where:
x = December average clear sky insolation
y = December average partly cloudy sky insolation
z = December average cloudy sky insolation

This process was repeated within the model for each of the 12 months.

The number of average cloudy and clear sky days per month was obtained from the Western Regional Climatic Center (WRCC). According to the WRCC a clear day is defined as having zero to three tenths average cloud cover. A partly cloudy day is defined as having four tenths to seven tenths average cloud cover. A cloudy day is defined as having eight tenths to ten tenths average cloud cover. Table 2 below indicates the total number of days, by month, with clear skies, partly cloudy skies, and cloudy skies for Salt Lake City as defined by the WRCC.

Sky Condition	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Clear	6	5	7	7	9	14	17	16	16	14	8	6	125
Cloudy	19	16	16	14	12	6	4	4	5	9	15	18	138
Partly Cloudy	6	7	8	9	10	10	10	11	9	8	7	7	102
% Sunshine	45	54	64	69	72	80	83	82	82	72	53	42	66

Table 2: Total number of clear sky, partly cloudy, and cloudy days for Salt Lake City

Model Calibration

The model was calibrated using atmospheric transmissivity indexes obtained from NASA. The Atmospheric Science Data Center and NASA have calculated 22 year clear sky index averages from 1983 to 2005 utilizing data collected from hundreds of weather stations through the continental United States including Weather-Bureau-Army-Navy (WBAN) station number 24127 (WBAN24127) located at Salt Lake City International Airport.

The study area's proximity to WBAN24127 station (within 25 kilometers) allows us to accurately use data from the station for calibration purposes. Data from this station has been used by NASA, WRCC, and NREL to calculate different coefficients including expected solar insolation in a flat surface. The expected insolation values in a flat surface calculated for this station were used to calibrate our model. Refer to Appendix E for the corresponding NASA Surface Meteorology and Solar Energy report for Salt Lake City.

For the clear sky model the NASA monthly average clear sky insolation normalized clearness indexes were used for the transmissivity factor. Diffusion indexes were calculated based on a

one hundred percent clearness index and adjusted to monthly average clear sky insolation normalized clearness indexes as indicated below.

$$CSD = (1 - AI) - \left[(1 - AI)\left[\frac{AI - NI}{AI}\right]\right]$$

$Where$:
$CSD\ is\ Clear\ Sky\ Diffusion$
$AI\ is\ Monthly\ Averaged\ Clear\ Sky\ Insolation\ Clearness\ Index$
$NI\ is\ Monthly\ Averaged\ Clear\ Sky\ Insolation\ Normalized\ Clearness\ Index$

The partly cloudy day model used the monthly averaged insolation clearness index as the transmissivity factor. Diffusion indexes were calculated as the difference between partly cloudy day transmissivity and the sum of clear day transmissivity and diffusion. In other words, the total insolation for clear sky days and partly cloudy days is the same but for partly cloudy days more insolation is received at ground level as diffuse insolation. Table 3 shows the transmissivity and diffusion factors that were used for clear sky, partly cloudy, and cloudy models.

$$PCD = (CST + CSD) - PCT$$

$Where$:
$PCD\ is\ Partly\ Cloudy\ Diffusion$
$CST\ is\ Clear\ Sky\ Transmitivity$
$CSD\ is\ Clear\ Sky\ Diffusion$
$PCT\ is\ Partly\ Cloudy\ Transmitivity$

Transmissivity and diffusion for the cloudy day model were calculated as follows:

$$CDT = PCT - (CST - PCT)$$
$$CDD = (CST + CSD) - CDT$$

$Where$:
$CDT\ is\ Cloudy\ Day\ Transmitivity$
$PCT\ is\ Partly\ Cloudy\ Transmitivity$
$CST\ is\ Clear\ Sky\ Transmitivity$
$PCT\ is\ Partly\ Cloudy\ Transmitivity$
$CDD\ is\ Cloudy\ Day\ Diffusion$
$CSD\ is\ Clear\ Sky\ Diffusion$

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Clear Sky Indexes												
Transmissivity Index	0.690	0.710	0.730	0.730	0.720	0.700	0.680	0.640	0.680	0.690	0.690	0.680
Diffusion	0.230	0.212	0.183	0.183	0.191	0.221	0.239	0.261	0.239	0.230	0.230	0.239
Total	0.920	0.922	0.913	0.913	0.911	0.921	0.919	0.901	0.919	0.920	0.920	0.919
Partly Cloudy Indexes												
Transmissivity Index	0.585	0.585	0.580	0.550	0.500	0.500	0.500	0.600	0.620	0.600	0.585	0.585
Diffusion	0.335	0.337	0.333	0.363	0.411	0.421	0.419	0.301	0.299	0.320	0.335	0.334
Total	0.920	0.922	0.913	0.913	0.911	0.921	0.919	0.901	0.919	0.920	0.920	0.919
Cloudy Indexes												
Transmissivity	0.480	0.460	0.430	0.370	0.280	0.300	0.320	0.560	0.560	0.510	0.480	0.490
Diffusion	0.440	0.462	0.483	0.543	0.631	0.621	0.599	0.341	0.359	0.410	0.440	0.429
Total	0.920	0.922	0.913	0.913	0.911	0.921	0.919	0.901	0.919	0.920	0.920	0.919

Table 3: Transmissivity and diffusion indexes used for the Cloud-Based Solar Insolation model

During the calibration of the model, calculated insolation results were compared to the values obtained from the WBAN24127 station and the NASA Surface Meteorology and Solar Energy Report for Salt Lake City to ensure that the transmissivity and diffusion indexes derived for the model led to the expected values.

Three flat surfaces were chosen to measure the results of the models and were compared to the expected insolation values for flat surfaces. Adjustments to transmissivity factors for winter months were made to partly cloudy indexes as part of the calibration process. The new indexes were applied to the formulas that calculate partly cloudy transmissivity and diffusion, and cloudy transmissivity and diffusion. The new indexes never exceeded the annual averaged insolation clearness index, and the total percentage of received insolation (transmissivity plus diffusion) remained unchanged.

During calibration the yearly average clearness index was used for the summer peak months of May and June. Partly cloudy and cloudy transmissivity indexes were calibrated and a difference between 0.9% and 4.32% was achieved when compared to expected results from WBAN24127 station.

Figure 3 shows the expected maximum, minimum and average expected insolation values from the WBAN24127 station, the expected values from the NASA Surface Meteorology and Solar Energy Report and the modeled insolation values. In all models, the sum of transmissivity and diffusion indexes for each month is between 90% and 92.2% of the total insolation value at the top of the atmosphere.

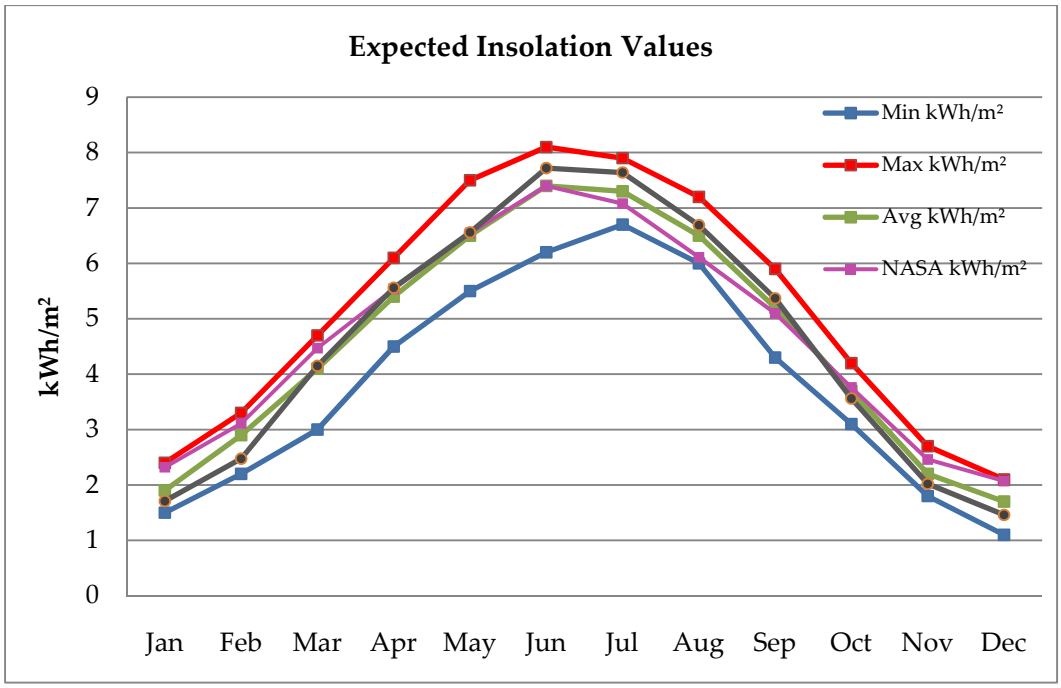

Figure 3: Modeled insolation values in relation to NASA Surface Meteorology and the WBAN24127 station

Identification of Roof Aspects and Objects

LiDAR data was obtained for the study area. For more details on the LiDAR data collection, processing or cleanup please see Appendix A. Rooftops were identified in the classified LiDAR data and used to develop a vector model of the roof outlines. The roof vectors were used to calculate total roof area.

Rooftop insolation models can be setup incorrectly by assuming that roof slope is continuous, roofs are flat, or that they have a continuous area that can be filled with solar panels. Architecture design varies from one building to the next. Finding those differences is important to assess the potential number of solar panels that can be installed on each roof. Roofs may have chimneys, air conditioning units and ducts, aspect changes, and dormers. These objects decrease the number of panels that can be installed on a roof. Calculating the total area of each rooftop is not enough to evaluate the number of panels that could be installed. Objects and other obstacles need to be identified.

Three different processes were tested to calculate roof aspect and object detection.

The first approach involved calculating a focal standard deviation to detect elevation change. Computations are performed in a three by three cell neighborhood which represents 3.34 square meters. The downside to this method is that the results become generalized. The analysis

window of 3.34 square meters is too large when working with smaller surface areas like rooftops.

The second method created a raster dataset representing roof aspect, or roof direction. This indicated what parts of the roof were south, north, east, and west facing. This approach worked for certain roof angles but produced inconsistent data for flat roofs. Figure 4 shows calculated aspect for the rooftops in the sample area. Each color in the image represents a part of the roof that faces a specific direction.

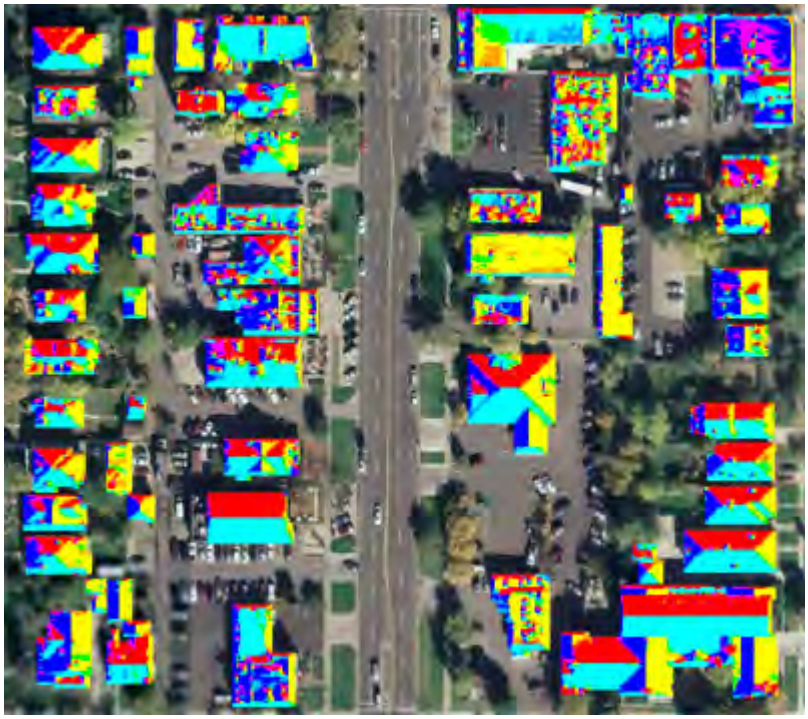

Figure 4: Aspects calculated for each rooftop in the study area

The last method used a hydrological approach of calculating focal flow of fluids on each rooftop. This method allowed us to simulate water flow on rooftops thus finding different aspect, changes in elevation, and objects. Objects on rooftops were well detected with this method, including flat rooftops. The downside to this method was that it produced some errors in roofs with lower pitch angles.

Based on the evaluation of these methods the flow of fluids method was used in this study to detect different regions and objects on flat rooftops. The aspect method was used to detect different regions and objects on pitched rooftops. Figure 5 shows the regions calculated with the flow of fluids model for the sample area.

The models resulted in raster grids which included cohesive regions of similar slope and aspect for each roof. These regions were converted to polygons for use in the next step.

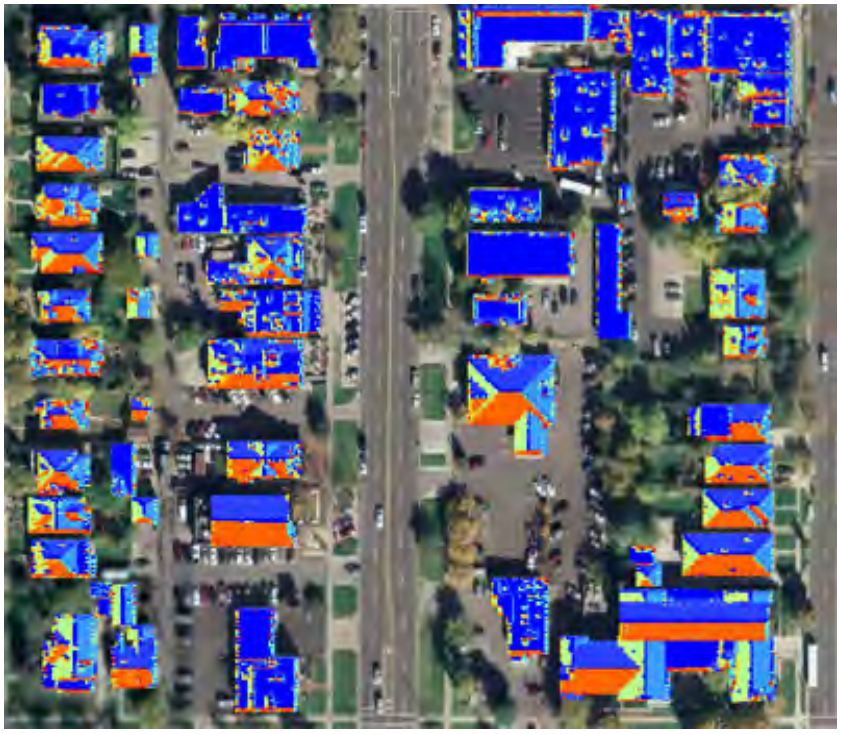

Figure 5: Output of flow of fluids model

Estimating number of panels per rooftop

The number of panels that could fit on a rooftop was estimated in this study in order to calculate solar energy generation potential with greater accuracy. The methodology for this calculation is explained below.

The following variables were assumed: 130 watt PV panels would be used and each panel would measure 1.42 meters by 0.66 meters. In order to simulate the installation of the panels a 1.42 meter by 1.42 meter grid dataset was created on top of each roof. Each of the resulting grid cells would fit two 130 watt PV panels. The goal was to determine the maximum number of panels that would fit each rooftop.

The resulting grid dataset was intersected with the cohesive slope/aspect region polygons created in the previous step. Model logic required that a cell that fit two panels must be contained completely by a region polygon. The cell should not intersect a region polygon since that would indicate that a change in the rooftop elevation, aspect, or an object would not allow the installation of two panels.

If the area of the resulting intersection was greater than fifty percent of the cell's area, and if it had a somewhat rectangular or squared shape it was assumed that at least one panel would fit in that part of the roof.

A script was built to eliminate cells with an area less than 65% of the original cell size, and with an irregular shape. A bounding box for each cell with an area of less than 65% of the original cell was created. If the cell's area is ninety percent similar to the bounding box's area that meant the cell had a somewhat regular shape, otherwise it has an irregular shape. An additional filter was built to detect cells with ten or more vertices or corners. Those cells identified for this filter had a high irregular shape and were eliminated because they would not fit a PV panel.

All other cell intersections resulting in an area of less than fifty percent of the cell's area was assumed to be unfit to accommodate a single panel. Figure 6 shows estimated number of PV panels that could fit on a rooftop after evaluating different regions on each rooftop for the sample area. Orange cells could fit two panels; yellow cells could fit one panel.

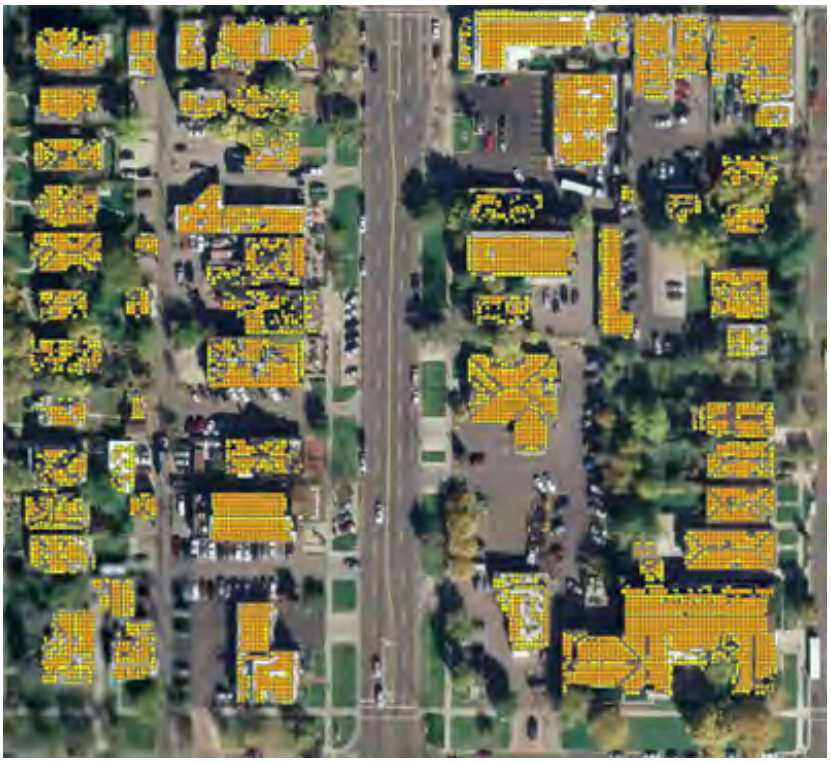

Figure 6: Estimated number of PV panels per rooftop

A more accurate prediction of the number of PV panels that could be installed on each rooftop was estimated by taking into account roof aspect, changes in shape, and other objects that may interfere with installation. This process also facilitated the estimation of solar insolation per panel thus providing a better assessment of solar energy generation potential per rooftop.

Solar Insolation and Energy Calculations

Rooftops with an area of less than 100 square meters were not considered for PV panel installation in order to keep the study focused on main buildings within each parcel. All other rooftop polygons derived from LiDAR data were used to extract the estimated solar radiation per rooftop per month. Zonal statistics were computed in ArcGIS to extract the solar insolation values for each of the rooftops in the study area.

The same procedure was performed on the PV panel dataset. Annual daily average solar insolation and daily average solar insolation for the summer were extracted per solar panel from the model's outputs. Figure 7 shows the annual daily average solar insolation values per panel for the sample area. Yellow panels are estimated to receive a daily average between 4kWh/m² and 5kWh/m² and red panels are estimated to receive between 5.0 kWh/m² and 5.25 kWh/m².

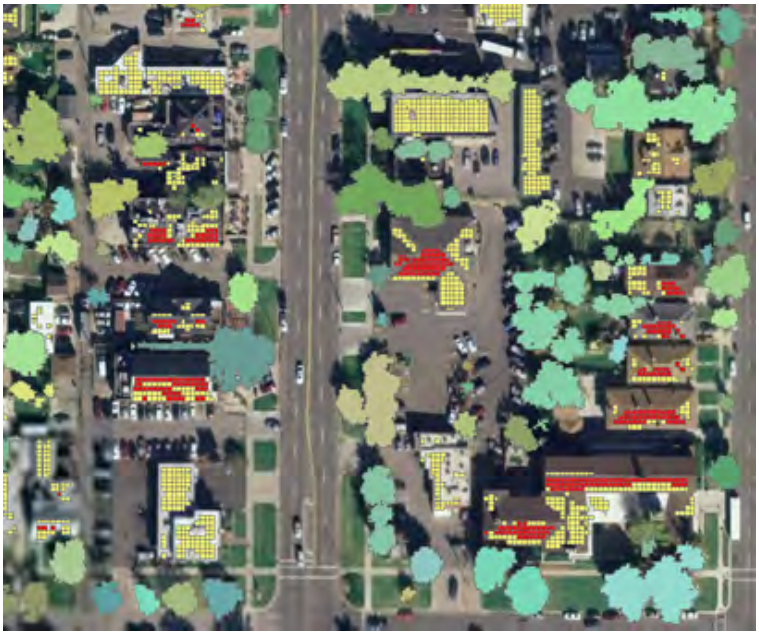

Figure 7: Annual daily average solar insolation values per panel

The annual daily average solar insolation and summer daily average solar insolation values per panel were used to calculate the estimated solar energy output per panel as follows:

$$Energy = SI * PVa * PVratio * Cl$$

$Where: SI\ is\ Average\ Daily\ Solar\ Insolation$

$PVa\ is\ PV\ panel\ area\ in\ meters^2$

$PVratio\ is\ PV\ panel\ efficiency\ ratio\ per\ 1000\ watts\ of\ solar\ insolation$

$Cl\ is\ convertion\ rate$

The conversion rate from DC to AC was set to ninety percent; the PV panel area was set to 0.939 square meters; PV panel efficiency ratio per 1000 watts of solar insolation was set to 0.13839.

The estimated energy calculations performed during this study were based on current roofs tilt. It must be noted that actual energy output varies depending on the tilt of the PV panel with respect to the roof. The effect of the PV panel tilt varies with time of the year. According to the NASA Meteorology and Solar Energy report for the study area PV panels installed with a tilt of zero to three degrees with respect to a flat roof would produce the most energy during June, but it would produce less energy in the following months. Refer to Appendix E for optimum angle per month for installation of tilted PV panels.

Solar Insolation and Distribution System Peaks

After reviewing the outputs from the monthly models it is easy to determine that the solar insolation peak occurs on June 21. As expected, this aligns with the summer solstice, when the Sun's apparent position in the sky reaches its northernmost extreme, resulting in the longest day of the year.

However, distribution system peaks do not occur on the same day as solar insolation peaks. Figure 8 shows a load profile for Northeast Circuit 16. The distribution load peaks occurs on or about August 2, 2010. The distribution system peak usually occurs within two weeks of this date each year, but has never occurred in June.

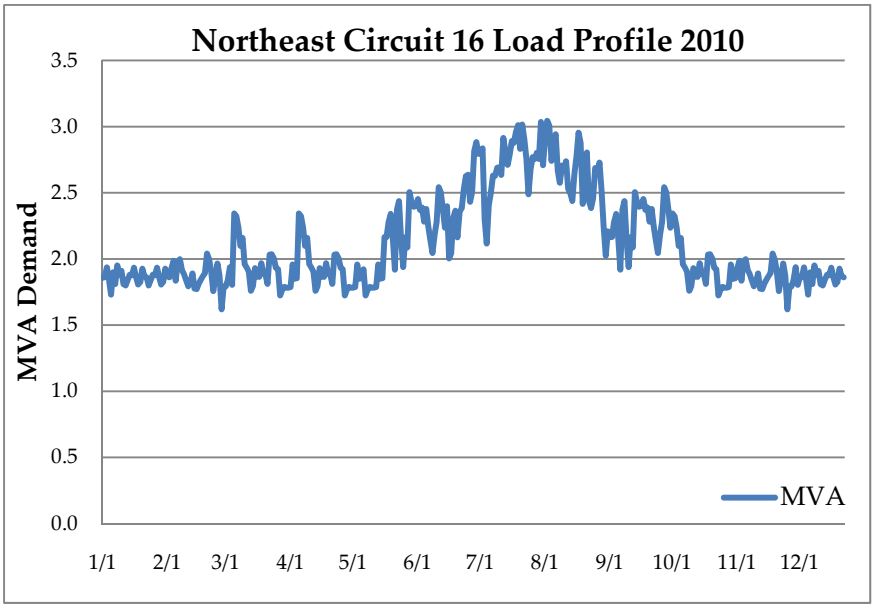

Figure 8: Load profile for Northeast Circuit 16

Individual models were setup to calculate hourly solar insolation to display the differences of available solar insolation between solar peak days and distribution system load peak days. Figure 9 shows the hourly solar insolation distribution for the peak insolation day – June 21.

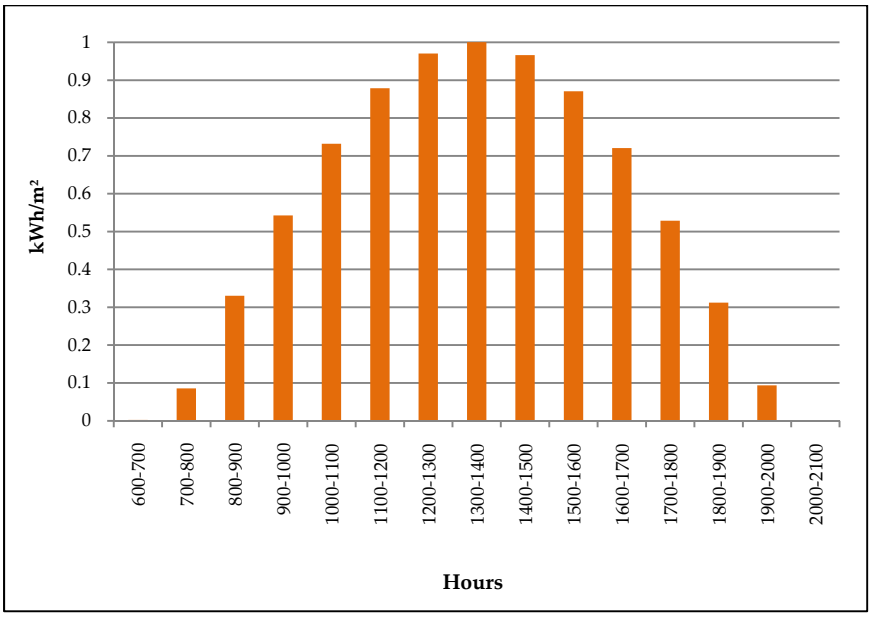

Figure 9: Peak solar insolation

Figure 10 below shows the hourly solar insolation distribution for the distribution system's summer peak load day.

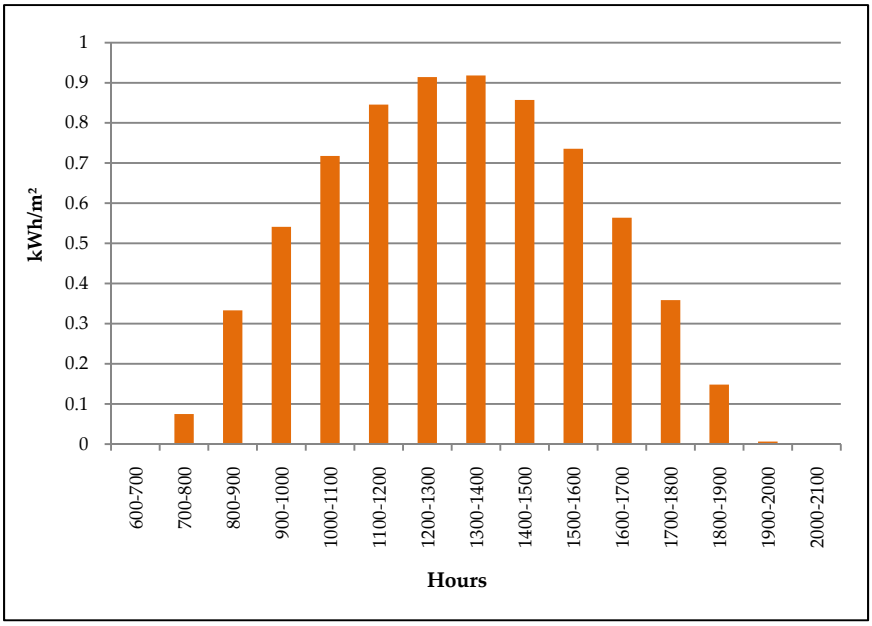

Figure 10: Solar insolation for distribution peak day

Two separate scenarios are analyzed to assess how much load can be offset from the system during peaks by incorporating distributable generation. Scenario one analyzes solar energy generation based on summer-only modeled solar insolation values. Scenario two analyzes solar energy generation based on year round modeled solar insolation values.

Results

The model's results and WBAN24127 data indicate that the peak average daily solar insolation for flat surfaces occurs in June. As tilt degree increases, the insolation peak shifts towards July.

Most of the rooftops in the study area reach their solar insolation peak between June and July. This aligns with the summer solstice that occurs on June 21 resulting in the most sunlight per meter squared reaching a surface.

Two different scenarios were modeled for this study. Scenario one was setup for summer months only, from May to September. These months are consistent with Rocky Mountain Power's Electric Service Schedule No. 1 that defines summer months for residential electric service. Scenario two was setup for an entire year.

Assessment data obtained from Salt Lake County was used to categorize buildings according to their land use. The following categories were created to summarize results for Scenario One and Scenario Two:

- Residential: this category includes all single family residential buildings.
- Multi-residential: includes duplexes, condominiums, apartments, multiple residential, time shares, and fraternity/sorority houses.
- Commercial: includes retail stores, convenience stores, and restaurants.
- Institution: includes banks, churches, hospitals, medical offices, and general offices.
- Unknown: includes all buildings for which land use data was not available.

Scenario One Results – Summer Solar Output

The purpose of scenario one is to analyze the potential solar energy generation during the months when the demand for electricity is higher.

Roof areas that receive the greatest amount of solar insolation are those facing south, southeast, or southwest. During the summer months the average daily insolation received by south facing roofs in the study area is 5.695 kWh/m². Solar panels that received at least 5.695 kWh/m² of solar insolation per day during the summer were considered as the most cost effective and viable for installation.

According to assessment data from Salt Lake County the study area includes 154 residential buildings with a median rooftop area of 171 square meters. During the summer the median number of PV panels per residential building is 25, at least four buildings are not suitable for installation of a single PV panel, and the maximum number of panels on a single building is 119; this building is located at 275 S. Douglas St., and has a roof area of 328 square meters. The median percentage of usable roof area for residential buildings is 13.81 percent.

A total of 54 multi-residential buildings are found within the study area. The median estimated number of PV panels per multi-residential building during the summer is 32, and the median percentage of usable roof area per building is 19.88 percent. At least three buildings are not suitable for installation of PV panels, and the maximum number of PV panels on a single building is 397.

Nine commercial buildings are found within the study area. The median roof footprint for these buildings is 348 square meters and the median number of PV panels per building is 136. The median percentage usable roof area per building is about 31.31 percent. The building that fits the least number of PV panels is a restaurant located at 224 South 1300 East; it can fit only six PV panels. The building that fits the most PV panels under this category is a retail store located at 206 S University St. This retail store has a flat roof with an area of 650 square meters that could fit 340 PV panels, or 49 percent of the roof area can accommodate PV panels.

In the institution category offices have the least roof footprint and hospitals and churches have the greatest. The median roof footprint is 430 square meters and the median number of PV panels for the summer is 160. The median percentage usable roof area per building is 32.74 percent.

A church located at 951 East 100 South could fit the most PV panels; the total PV panel count for this building is 917. Another church located at 274 S. University St. can fit 722 panels and has the second greatest roof footprint in the study area.

Other buildings with comparable roof footprint as churches are hospitals, but they can only fit a maximum of 371 PV panels. The difference between these types of buildings is that churches have fewer obstructions in their rooftops; hospitals on the other hand have numerous AC units and other equipment occupying a great portion of their roofs.

Parcels with unknown land use comprise the last category of buildings within the study area. The median roof area is 195 square meters and the median number of PV panels per building is 27. The median percentage usable roof area per building is 14.57 percent.

A summary of results per building category for scenario one is provided as Table 4 below. For individual building results please consult tables in Appendix C.

Category	Type of Buildings	Median Roof Footprint	Median # of PV Panels	Minimum # of PV Panels	Maximum # of PV Panels	Average % Usable Roof Area
Residential	Single Family Residential	171 m²	25	0	119	13.81%
Multi-Residential	Apartments, Condos, Fraternity/Sorority, Duplex	173 m²	32	0	397	19.88%
Commercial	Restaurant, Commercial Retail,	349 m²	136	6	340	31.31%
Institution	Churches, Banks, Hospitals, Offices	430 m²	160	16	917	32.74%
Unknown	Unknown Land Use	196 m²	26	2	262	14.57%

Table 4: Building summary results for Scenario One

Scenario Two Results – Yearly Solar Output

The purpose of scenario two is to look at the potential solar energy generation through the entire year.

The average daily insolation received by south facing roofs per year in the study area was estimated to be 4.08 kWh/m². Under this scenario PV panels that received at least this much solar insolation per day during an entire year were considered as the most cost effective and viable for installation.

Under scenario two, the median number of PV panels that could be installed per single family residential building is 21. Eleven buildings are not suitable for installation of a single PV panel, and the maximum number of PV panels on a single building is 90. Just like in scenario one the building that fits the most PV panels is located at 275 S. Douglas St. The median percentage usable roof area for single family residential buildings is 10.6 percent.

Multi-residential buildings within the study area total 54. The median estimated number of PV panels per multi-residential unit is 27, and the median percentage usable roof area per building is 14.78 percent. Six of these buildings are not suitable for installation of PV panels, and the maximum number of panels that can be installed on a single building is 368. This building is a condominium complex located at 960 E. 100 S. and it has a roof area of 547 square meters.

There are nine commercial buildings within the study area. The median roof footprint for these buildings is 348 square meters and the median number of PV panels per building under scenario two is 125. The median percentage of usable roof area per building is about 28.77 percent. As in scenario one, the building that fits the least number of PV panels is a restaurant located at 224 South 1300 East; under scenario two this building can fit nine PV panels.

The commercial building that fits the most PV panels is a retail store located at 206 S University St. The flat rooftop on this store has an area of 650 square meters and it can fit 331 PV panels accounting for 47.8 percent of the roof's total area.

In the institution category offices have the least roof footprint and hospitals and churches have the greatest. The median roof footprint is 430 square meters and the median number of PV panels under scenario two is 143. The median percentage usable roof area per building is 27.88 percent.

The least number of PV panels that can be installed under this category is one; this is a building located at 227 S. 1300 E. The institution building that fits the most panels is a church located at 951 E. 100 S. The total roof area for this church is 1986 square meters and under scenario two it can fit an estimated 877 PV panels accounting for 41.47 percent of the church's roof. Another church located at 274 S. University St. can fit 420 panels.

The institution building with the greatest percentage of usable roof is an office building located at 170 South 1000 East. Approximately 66.57 percent of its roof area can be fitted with PV panels.

The last category is that of buildings with unknown uses. Under scenario two the median number of PV panels per building is 23, the maximum is 246, and there is a building that's not viable for PV installation and another that has potential for a single PV panel. The median percentage usable roof area per building under this category is 13.15 percent.

A summary of results per building category for scenario two is provided in Table 5 below. For individual building results please consult the tables in Appendix C.

Category	Type of Buildings	Median Roof Footprint	Median # of PV Panels	Minimum # of PV Panels	Maximum # of PV Panels	Average % Usable Roof Area
Residential	Single Family Residential	171 m²	21	0	90	10.60%
Multi-Residential	Apartments, Condos, Fraternity/Sorority, Duplex	173 m²	27	0	368	14.78%
Commercial	Restaurant, Commercial Retail,	349 m²	125	9	331	28.77%
Institution	Churches, Banks, Hospitals, Offices	430 m²	143	1	877	27.88%
Unknown	Unknown Land Use	196 m²	23	0	246	13.15%

Table 5: Building summary results for Scenario Two

Conclusions

Results provided for this study are based on two different scenarios. Scenario one was setup for summer months only, from May to September. These months are consistent with Rocky Mountain Power's Electric Service Schedule No. 1 that defines summer months for residential electric service. Scenario two was setup for an entire year.

The first scenario considers PV panels that receive a minimum daily average solar insolation of 5.695 kWh/m² during the summer. The second scenario considers PV panels that receive a minimum annual daily average solar insolation of 4.08 kWh/m².

Under scenario one, a total of 237 buildings within the study area have the potential for the installation of at least one PV panel. The estimated maximum number of PV panels for the study area under this scenario is 13,304. Under scenario two, a total of 227 buildings within the study area have the potential for the installation of at least one PV panel. The estimated maximum number of PV panels under scenario two is 11,193.

Under both scenarios, institution buildings are estimated to have the greatest potential for the installation of PV panels. Commercial buildings have the second greatest potential, and multi-residential buildings' potential is rated third. Unknown land use buildings come second to last under both scenarios and single family residential have the least potential when compared to other types of buildings. The median number of panels per single family residential building is 25 for scenario one, and 21 for scenario two.

It should be noted that there is a variation in the efficiency rate of solar panels due to temperature which was not considered in this study. For information, the listed power of a solar cell is the power measured under ideal laboratory conditions, which prescribe a temperature of 25 °C (77 °F). However, on a typical hot summer day, it is not uncommon for a solar cell to reach a temperature of 70 °C (158 °F). A general rule of thumb is that the efficiency of a solar cell decreases with 0.5% for every 1 °C (1.8 °F) above 25 °C (77 °F). This means that on a hot summer day, the efficiency of a solar cell could drop as much as 25%.

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APPENDIX A

LiDAR Data Collection, Processing and Clean Up

LiDAR Data Collection

The LiDAR data for this study was collected by TOWILL Inc., in October 2010 with an Optech Orion laser system at an altitude of 2,600 feet above ground level, a scan rate of 51Hz, scan angle of +/- 18 degrees, overlap of 55%, pulse rate of 100 kHz, 52-meter and 0.53-meter spacing across track and along track, respectively. The data was referenced horizontally to the North American Datum of 1983 (NAD83) and projected to the Utah State Plane System of 1994, Central Zone, with International Feet as ground units. Vertically the data was referenced to the North American Vertical Datum of 1988 (NAVD88), with International Feet as ground units. Datum origin coordinates are defined by the National Geodetic Survey control point "Temple 13" (PID L0694), a first order horizontal point and second order, class 0, vertical point mounted by a brass cap set approximately 5 cm (2") below the surface of the street in an 20.3 cm (8") diameter monument located at the intersection of South Temple Street and Thirteenth Street East, Salt Lake City, Utah.

Estimated vertical error of the collected LiDAR data is about 9 cm based on field survey positions tested against the LiDAR-derived points. Horizontal error is generally less than vertical error, so it is safe to assume horizontal error to be less than 9 cm.

LiDAR data was collected with a density of at least six points per square meter. First return points were used to generate a 0.61 meter by 0.61 meter (2' x 2') digital elevation model raster which was used as input to the Cloud-Based Area Solar Insolation Model.

LiDAR Data Processing

To illustrate the steps required to quantify the data obtained from the LiDAR survey, a sample area from the pilot area will be used. This sample area is the block bounded by 200 South to 300 South and from Douglas Street to University Street.

Figure 11 below shows a digital elevation model derived from first return LiDAR points showing buildings, vegetation and ground level based on differential elevation for the sample area.

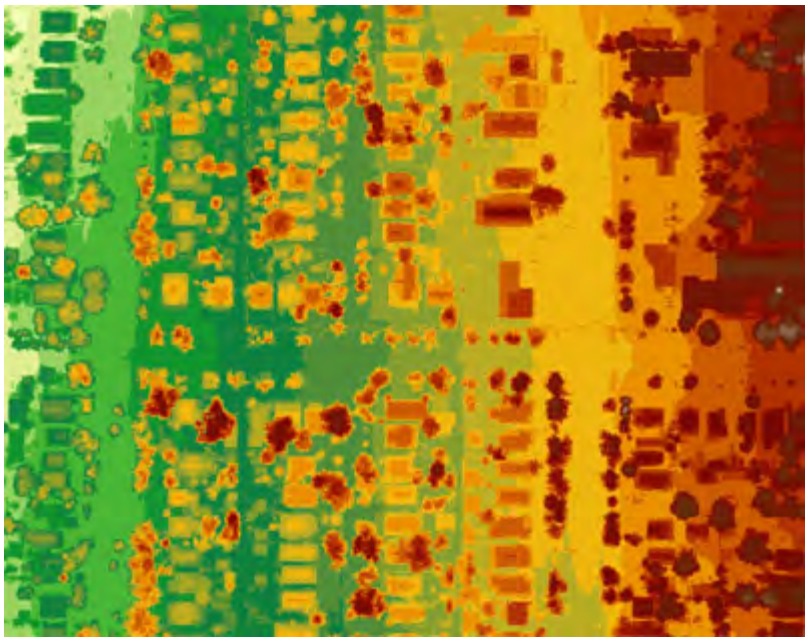

Figure 11: Digital Elevation Model

A digital elevation model containing pixels corresponding to roof outlines in the study areas was developed from LiDAR data by TOWILL by means of data classification. The digital elevation model was used to develop polygon outlines of each rooftop in the study area. The pixel regions were converted to rough polygons using a raster-to-feature function. The resulting polygons contained errors and irregular shapes, so the polygons were refined using a function to simplify the outlines. The shapes were analyzed and corrected against National Agricultural Information Program (NAIP) high-resolution orthorectified aerial imagery.

To the extent possible, roof edges obscured by LiDAR data from tree surfaces were restored to their original shapes. Misclassified pixels found around the edges of many roofs, which were actually upper wall edges, patios, awnings, etc., were removed from the roof surfaces. Secondary roof surfaces were identified to acknowledge the presence of split-level roofs, sheds, garages and other surfaces that may be stable, relatively flat surfaces that could potentially accommodate photovoltaic panels but which were not part of the main structure's primary roof. Roofs were then given unique identifiers based their tax lot identification number.

LiDAR Data Clean Up

LiDAR data are collected with sensitive equipment that is prone to capturing objects that should not be in the data. According to TOWILL, flocks of birds may be represented in the first return data as high altitude points. Obstructions generally show up in imagery as very small areas (i.e., one pixel representing 1 meter square), but given their altitude they cast a shadow which appears in the results as a long line of outlying values. Leaving these objects in the data

could potentially impact results; therefore, they were identified and removed using mathematical focal functions which isolate outlying values. New elevation values for those points were calculated using nearest neighbor interpolation methods.

Missing data is another issue when working with LiDAR. This can create concern when consecutive points have missing data, or when points were not captured for large features on the ground. The LiDAR data collected for the study area had some missing data areas; fortunately there were no large hot spots of missing data which would have been difficult to interpolate accurately. Missing data was calculated by interpolating the values of immediate neighboring points. “No data” areas remained in a few spots where there was a lack of points to perform an interpolation of values; however those areas of missing data were generally at ground-level and their effect in the results was insignificant.

APPENDIX B

Minimum & Maximum Estimated Solar Insolation per Rooftop

Table 1 shows the estimated monthly and annual average solar insolation per rooftop. Values are shown as kilowatt hours per meter square. Roof IDs are equal to county parcel IDs. Multiple roofs within a single parcel are identified with an "_a" at the end of the roof ID.

Roof ID	Address	Area	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
		meters²	kWh/m²	kWh/m²	kWh/m²	kWh/m²	kWh/m²	kWh/m²	kWh/m²	kWh/m²	kWh/m²	kWh/m²	kWh/m²	kWh/m²	kWh/m²
1604151001	1318 E 200 S	143.68	22.82	31.61	50.87	62.75	76.33	82.34	84.72	77.35	63.11	45.54	25.91	19.63	642.98
1604151004	206 S UNIVERSITY ST	650.50	25.73	37.38	62.20	79.40	98.88	107.62	110.24	98.72	78.08	54.12	29.49	21.70	803.55
1604151005	220 S UNIVERSITY ST	147.11	8.23	12.97	25.44	40.29	57.50	65.36	65.24	52.02	33.16	18.22	9.28	6.95	394.65
1604151006	222 S UNIVERSITY ST	128.65	13.41	18.60	31.88	45.29	60.47	67.50	68.65	58.32	40.78	26.17	15.01	11.61	457.69
1604151007	232 S UNIVERSITY ST	243.67	19.51	28.02	46.72	60.87	76.62	83.68	85.64	76.22	59.09	40.30	22.29	16.51	615.45
1604151008	240 S UNIVERSITY ST	110.81	22.47	31.44	51.05	63.41	77.16	82.79	85.30	78.25	63.65	45.40	25.55	19.36	645.82
1604151011	252 S UNIVERSITY ST	209.30	22.68	31.98	53.46	68.45	85.19	92.45	94.77	84.96	67.00	46.14	25.71	19.53	692.33
1604151014	264 S UNIVERSITY ST	336.20	21.34	31.97	54.51	68.93	85.20	92.61	94.86	85.27	68.36	46.67	24.71	17.75	692.20
1604151015	274 S UNIVERSITY ST	1414.89	20.63	30.38	52.36	68.20	85.66	93.49	95.62	85.04	66.16	44.17	23.65	17.42	682.77
1604151016	248 S UNIVERSITY ST	224.64	21.23	30.88	52.83	67.97	85.02	92.60	94.69	84.28	66.23	44.86	24.18	18.18	682.94
1604151017	258 S UNIVERSITY ST	225.19	23.33	33.36	55.77	70.66	87.68	95.31	97.65	87.56	69.78	48.17	26.63	19.85	715.73
1604151018	1320 E 200 S # C	473.30	25.82	36.73	60.45	76.51	94.40	102.33	105.13	94.98	75.73	53.04	29.45	22.01	776.57
1604152001	1318 E 300 S	154.89	22.89	31.78	51.95	65.42	81.07	88.05	90.20	80.98	64.77	45.64	25.94	19.72	668.40
1604152002	1330 E 300 S	157.33	17.21	25.18	43.10	56.52	72.54	79.87	81.36	70.84	54.27	36.43	19.67	14.56	571.53
1604152003	1336-1338 E 300 S	191.71	20.02	29.72	51.70	68.11	86.22	94.56	96.51	85.05	65.22	43.19	22.90	16.95	680.14
1604152004	1342 E 300 S	169.11	17.05	25.12	43.15	56.85	72.29	78.99	80.67	70.99	54.44	36.36	19.52	14.46	569.89
1604152005	316 S UNIVERSITY ST	115.59	22.01	31.66	53.89	68.00	82.72	89.43	92.17	84.36	68.19	46.14	25.21	18.57	682.35
1604152006	316 S UNIVERSITY ST	152.38	19.79	29.32	50.03	62.44	74.79	80.10	83.04	77.53	63.47	43.50	22.88	16.70	623.59
1604301007	322 S UNIVERSITY ST	147.25	24.80	34.74	56.24	70.71	87.72	95.33	97.59	87.36	69.82	49.70	28.19	21.31	723.50
1604301008	328 S UNIVERSITY ST	88.20	7.97	11.72	20.82	31.41	45.94	52.92	52.14	39.72	25.80	15.91	8.87	6.79	320.02
1604301009	332 S UNIVERSITY ST	167.63	14.36	25.21	47.06	61.67	77.35	84.55	86.41	76.84	59.61	38.09	17.20	11.35	599.71
1604301010	340 S UNIVERSITY ST	116.45	8.80	12.29	22.08	39.61	61.46	71.46	70.35	51.97	28.12	15.44	9.50	7.68	398.76
1604301011	346 S UNIVERSITY ST	196.91	25.39	35.17	55.33	64.02	73.46	77.01	80.45	77.89	68.48	51.41	29.06	21.94	659.62
1604301013	356 S UNIVERSITY ST	182.46	20.24	28.40	46.94	59.53	73.48	79.30	81.38	73.41	58.62	40.79	23.00	17.39	602.47
1604301014	362 S UNIVERSITY ST	134.50	18.74	25.97	42.97	54.24	67.33	72.94	74.70	66.88	53.52	37.35	21.17	16.25	552.05

Roof ID	Address	Area meters²	Jan kWh/m²	Feb kWh/m²	Mar kWh/m²	Apr kWh/m²	May kWh/m²	Jun kWh/m²	Jul kWh/m²	Aug kWh/m²	Sep kWh/m²	Oct kWh/m²	Nov kWh/m²	Dec kWh/m²	Annual kWh/m²
1604301015	368 S UNIVERSITY ST	118.70	20.22	31.77	57.41	76.40	95.91	104.79	107.31	95.59	73.32	46.87	23.53	16.59	749.72
1604301016	1319 E 400 S	95.56	11.72	19.14	36.88	52.48	68.95	76.62	77.92	66.86	47.95	28.29	13.54	9.70	510.04
1604301017	1321 E 400 S	72.24	9.44	16.27	33.79	50.54	68.71	77.35	78.16	64.80	44.03	24.34	10.99	7.71	486.13
1604301018	1327 E 400 S	117.65	13.73	21.40	39.55	53.84	68.50	75.31	77.08	68.08	51.12	31.77	15.91	11.45	527.74
1604301019	1333 E 400 S	108.71	19.53	28.80	50.12	66.97	85.80	94.09	95.93	83.89	63.40	41.55	22.30	16.49	668.88
1604301020	1337 E 400 S	113.07	17.89	24.84	41.77	55.26	70.17	76.98	78.47	68.87	52.31	35.40	20.08	15.58	557.62
1604301026	348 S UNIVERSITY ST	171.64	20.91	29.91	50.63	64.18	79.35	86.19	88.36	79.56	63.70	43.71	23.77	17.99	648.26
1604301027	352 S UNIVERSITY ST	171.23	18.94	26.48	44.81	59.02	75.14	82.51	84.03	73.56	56.28	37.85	21.36	16.35	596.34
1605127005	35 S 900 E	1386.33	16.88	25.39	45.27	61.32	78.69	86.81	88.60	77.42	57.68	37.00	19.35	14.21	608.62
1605127007	41 S 900 E	834.27	20.03	29.76	51.25	67.03	83.86	91.67	93.99	84.12	65.12	43.46	23.10	16.77	670.16
1605127009	59 S 900 E	146.47	14.23	24.01	44.96	60.52	76.85	85.05	86.94	76.76	58.13	36.30	16.82	11.56	592.13
1605127010	63 S 900 E	126.36	11.82	19.05	36.24	50.47	65.05	71.88	73.37	64.01	47.27	28.26	13.79	9.61	490.81
1605127017	12 S HAXTON PL	142.49	13.74	19.02	32.63	45.34	59.24	65.73	66.89	57.43	41.54	26.74	15.38	11.90	455.58
1605127018	16 S HAXTON PL	142.83	19.87	29.13	48.21	60.49	74.04	79.62	82.15	74.97	60.03	42.35	22.84	16.88	610.58
1605127019	22 S HAXTON PL	118.49	18.51	26.06	46.18	63.78	80.14	87.08	89.68	80.65	59.84	37.66	20.81	15.97	626.36
1605127020	32 S HAXTON PL	134.79	14.61	22.67	43.00	60.27	76.78	83.84	86.05	76.38	56.28	33.70	16.82	12.29	582.69
1605127021	35 S HAXTON PL	194.09	20.54	27.86	44.61	56.51	69.86	75.51	77.42	69.70	55.37	39.63	23.13	17.89	578.03
1605127027	927 E 100 S	181.32	9.41	14.55	27.27	39.72	53.70	60.29	60.90	50.76	35.13	20.98	10.70	7.93	391.34
1605127027_a	945 E 100 S	98.42	16.82	26.28	47.46	63.57	80.60	88.74	90.86	80.43	61.08	38.94	19.57	13.80	628.16
1605127028	945 E 100 S	211.17	15.70	22.99	40.65	55.05	71.36	78.85	80.06	69.04	51.58	33.23	17.78	13.49	549.78
1605127028_a	945 E 100 S	104.66	18.53	28.08	48.25	62.64	78.59	85.80	88.10	78.74	61.21	41.10	21.51	15.33	627.87
1605127029	919 E 100 S	147.49	18.01	24.75	39.98	49.63	60.14	64.65	66.61	61.12	49.70	35.57	20.39	15.58	506.14
1605127030	921 E 100 S	115.08	13.96	20.95	35.09	43.94	53.79	58.33	60.04	54.52	44.03	30.73	16.23	11.61	443.22
1605127033	75 S 900 E	197.28	21.72	30.34	48.34	58.19	69.48	74.60	77.23	71.96	60.27	44.19	24.85	18.64	599.81
1605128001	3-5 S HAXTON PL	194.93	17.98	26.02	44.59	58.96	75.57	83.52	84.96	73.81	56.05	37.42	20.40	15.39	594.68
1605128002	19 S HAXTON PL	234.08	9.64	14.33	26.73	43.01	61.50	69.99	70.08	55.79	35.03	19.95	10.75	8.24	425.06
1605128002_a	19 S HAXTON PL	102.30	9.50	17.67	39.15	55.32	70.66	77.66	79.75	70.67	52.07	28.13	11.32	7.66	519.55
1605128003	31 S HAXTON PL	171.40	19.55	26.92	44.06	57.55	73.62	81.81	83.10	72.14	55.10	38.19	22.07	16.90	591.02

Roof ID	Address	Area meters²	Jan kWh/m²	Feb kWh/m²	Mar kWh/m²	Apr kWh/m²	May kWh/m²	Jun kWh/m²	Jul kWh/m²	Aug kWh/m²	Sep kWh/m²	Oct kWh/m²	Nov kWh/m²	Dec kWh/m²	Annual kWh/m²
1605128004	35 S HAXTON PL	196.82	18.83	25.43	40.68	52.04	65.37	71.22	72.81	64.67	50.52	36.02	21.18	16.44	535.21
1605128006	951 E 100 S	1986.43	23.52	34.04	58.07	75.80	95.62	104.66	106.97	94.59	73.15	49.29	26.79	20.04	762.54
1605128007	966 E SOUTHTEMPLE ST	230.46	19.29	26.92	44.09	56.58	71.37	78.06	79.56	70.16	54.75	38.39	21.81	16.66	577.65
1605128008	974 E SOUTHTEMPLE ST	219.37	20.47	27.95	46.37	60.27	75.85	82.83	84.55	74.82	58.03	39.78	22.93	17.92	611.76
1605128008_a	974 E SOUTHTEMPLE ST	212.93	21.26	32.39	55.33	71.45	89.28	97.59	99.92	89.16	69.65	47.35	24.67	17.64	715.69
1605128009	24-26 S 1000 E	193.27	19.58	27.12	47.17	63.06	79.42	86.54	88.67	78.88	60.31	38.92	21.95	17.06	628.68
1605128009_a	24-26 S 1000 E	129.94	10.60	17.17	35.40	53.35	70.90	79.48	80.65	68.42	47.41	25.54	12.21	8.79	509.93
1605128010	30 S 1000 E	159.05	18.29	25.74	42.98	54.48	67.92	74.38	75.65	66.84	53.36	37.01	20.65	15.84	553.15
1605128011	34 S 1000 E	216.12	17.20	26.52	47.33	62.25	78.59	86.46	88.57	78.26	60.24	39.09	19.99	14.20	618.67
1605128012	38 S 1000 E	133.16	21.10	29.51	48.13	60.58	73.94	79.64	81.86	74.70	60.09	42.51	24.05	18.09	614.19
1605128014	50-52 S 1000 E	99.028	11.21	16.06	26.91	41.25	59.83	68.82	68.29	53.17	33.1	21.5	12.6	9.365	422.14
1605128015	58 S 1000 E	368.55	16.26	25.07	45.36	62.26	80.91	89.53	91.05	78.70	58.01	36.72	18.68	13.70	616.26
1605128015_a	58 S 1000 E	124.28	10.67	16.71	32.32	47.00	61.82	68.89	70.11	60.20	42.42	24.67	12.21	8.93	455.96
1605128016	64 S 1000 E	129.53	21.55	29.43	48.06	59.09	70.98	76.42	78.92	73.09	60.31	42.78	24.43	18.78	603.82
1605128017	955 E 100 S	171.44	18.32	26.41	45.26	60.08	76.57	84.00	85.54	74.97	57.48	38.06	20.82	15.60	603.10
1605128019	975 E 100 S	213.93	21.06	29.81	49.34	63.29	78.98	85.82	87.85	78.57	61.89	42.90	23.95	18.00	641.45
1605134001	960 E 100 S # COM	547.00	25.19	36.86	62.53	81.42	102.55	111.95	114.29	101.66	79.01	53.28	28.81	21.42	818.96
1605135015	970 E 100 S	133.44	21.47	32.28	55.66	70.97	87.82	95.59	98.12	88.38	70.12	47.50	24.80	17.95	710.69
1605135016	120 S 1000 E	110.82	15.30	20.43	33.38	43.89	56.67	62.98	64.01	55.12	41.53	28.86	17.08	13.42	452.67
1605135017	128 S 1000 E	174.53	20.34	27.99	45.81	57.59	69.52	74.58	77.07	71.28	57.89	40.37	23.08	17.56	583.08
1605135018	130 S 1000 E	202.50	19.13	26.42	43.68	56.02	70.10	76.29	77.88	69.27	54.63	37.81	21.55	16.61	569.38
1605135019	150 S 1000 E	407.75	22.94	33.50	57.11	73.95	92.38	100.70	103.25	92.42	72.13	48.81	26.32	19.36	742.87
1605135027	160 S 1000 E	430.35	23.71	34.12	57.82	74.81	93.64	102.10	104.48	93.15	72.74	49.41	27.03	20.22	753.24
1605135028	170 S 1000 E	505.19	23.14	34.51	59.30	77.15	97.12	106.44	108.84	96.39	74.56	50.15	26.64	19.33	773.57
1605138001	908 E SOUTHTEMPLE ST	560.62	22.09	32.17	54.42	71.05	89.79	98.23	100.23	88.58	68.50	46.45	25.22	18.81	715.54
1605141001	926 E SOUTHTEMPLE ST	265.16	16.63	26.54	45.50	58.69	74.12	81.09	82.97	73.24	56.75	38.94	19.60	13.54	587.61
1605142001	42 S 1000 E	310.12	22.36	30.31	46.95	57.92	71.08	76.72	78.72	71.22	57.96	42.95	25.33	19.37	600.89
1605276001	205 S ELIZABETH ST	158.05	19.10	27.38	46.43	59.48	74.13	80.75	82.65	73.71	58.13	39.64	21.72	16.33	599.43

Roof ID	Address	Area meters²	Jan kWh/m²	Feb kWh/m²	Mar kWh/m²	Apr kWh/m²	May kWh/m²	Jun kWh/m²	Jul kWh/m²	Aug kWh/m²	Sep kWh/m²	Oct kWh/m²	Nov kWh/m²	Dec kWh/m²	Annual kWh/m²
1605276002	209 S ELIZABETH ST	136.96	14.78	24.52	44.19	57.62	73.43	80.96	82.63	72.23	55.64	36.35	17.49	12.00	571.84
1605276003	219 S ELIZABETH ST	242.72	15.92	24.80	44.74	61.60	79.54	87.50	89.12	77.66	57.41	36.13	18.38	13.24	606.06
1605276004	235 S ELIZABETH ST	167.94	14.74	23.75	43.86	60.76	79.46	88.16	89.44	76.68	56.09	34.73	17.14	12.09	596.89
1605276005	239 S ELIZABETH ST	244.53	20.89	30.69	52.43	68.67	86.90	95.23	97.35	85.90	66.18	44.38	23.96	17.62	690.19
1605276006	243 S ELIZABETH ST	227.44	14.58	24.31	46.35	63.23	80.92	89.21	91.14	79.97	59.85	36.63	17.10	11.93	615.23
1605276007	263 S ELIZABETH ST	138.12	19.72	27.31	45.14	58.48	74.10	80.99	82.79	72.95	56.26	38.87	22.28	16.97	595.84
1605276009	1152 E 200 S	172.46	17.49	25.92	45.12	59.89	76.08	83.35	85.12	74.88	57.20	37.49	20.06	14.66	597.27
1605276011	206 S 1200 E	222.70	16.79	30.14	57.07	74.29	92.08	100.31	102.83	92.61	72.76	46.02	20.35	13.10	718.35
1605276012	214 S 1200 E	196.25	18.21	25.64	42.30	53.90	67.41	73.22	74.90	66.68	52.62	36.79	20.63	15.65	547.96
1605276013	222 S 1200 E	186.08	21.57	30.00	48.93	62.44	77.60	83.92	86.05	77.45	61.15	42.90	24.43	18.64	635.09
1605276014	226 S 1200 E	221.64	19.94	28.61	47.58	60.69	76.07	82.32	84.48	75.59	59.44	41.41	22.74	17.01	615.89
1605276015	228-230 S 1200 E	199.98	20.29	29.06	48.26	61.57	76.82	83.61	85.28	76.09	60.33	41.85	23.14	17.36	623.68
1605276016	238 S 1200 E	283.72	22.79	33.20	55.77	70.62	87.52	94.93	97.42	87.85	69.99	48.46	26.11	19.38	714.03
1605276017	242 S 1200 E	290.18	16.75	27.01	49.07	66.74	84.98	93.07	95.17	84.26	62.84	39.70	19.69	13.46	652.76
1605276018	250 S 1200 E	158.44	12.26	20.01	37.97	53.49	70.30	77.88	78.92	67.36	48.57	29.34	14.19	10.11	520.40
1605276019	256 S 1200 E	118.35	13.21	21.86	41.47	55.02	67.67	73.63	75.95	69.33	54.13	33.24	15.61	10.80	531.92
1605276020	270 S 1200 E	235.53	10.59	15.90	29.97	44.41	60.01	67.68	68.40	57.18	39.30	22.99	11.96	9.02	437.41
1605276021	274 S 1200 E	396.94	17.94	26.27	44.93	58.46	73.45	80.20	82.24	73.31	56.90	38.33	20.58	15.19	587.81
1605276024	1155 E 300 S	717.18	20.03	29.63	51.70	68.59	87.00	95.42	97.34	85.65	65.38	42.94	22.90	16.91	683.49
1605276024_a	1155 E 300 S	141.62	7.74	11.46	30.02	55.64	78.96	88.99	90.29	74.75	42.87	16.75	8.30	6.79	512.58
1605277001	1212 E 200 S	230.59	15.40	23.57	44.14	62.10	80.98	89.26	91.07	78.83	57.07	34.50	17.52	13.12	607.57
1605277002	217 S 1200 E	238.39	17.33	25.95	44.81	58.86	74.10	80.76	82.55	73.23	56.26	37.64	19.92	14.62	586.03
1605277003	221 S 1200 E	145.19	19.33	27.07	44.48	55.40	67.31	72.64	74.57	68.11	55.73	39.21	22.05	16.52	562.43
1605277004	225 S 1200 E	163.54	18.14	25.71	44.31	58.82	73.42	79.56	81.53	72.94	56.25	36.98	20.46	15.68	583.81
1605277005	229 S 1200 E	180.92	16.03	21.96	35.54	46.17	58.74	64.19	65.17	56.76	43.87	30.84	18.00	13.93	471.19
1605277006	235 S 1200 E	149.12	14.05	22.52	42.13	58.30	75.33	83.24	84.88	73.94	54.48	33.36	16.33	11.57	570.14
1605277007	241 S 1200 E	161.80	23.05	31.21	50.00	62.39	77.01	83.09	85.17	76.83	62.05	44.54	25.99	20.01	641.34
1605277008	245 S 1200 E	212.83	14.05	21.33	39.66	56.62	74.57	82.89	84.15	72.13	51.45	30.92	15.94	11.98	555.66

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1605277009	253 S 1200 E	251.89	18.58	27.01	46.76	60.27	74.20	80.65	82.94	75.08	59.42	39.55	21.24	15.80	601.50
1605277010	259 S 1200 E	196.26	21.10	30.60	51.60	66.32	82.47	89.60	91.90	82.48	64.80	44.24	24.14	17.88	667.13
1605277011	263 S 1200 E	145.12	14.99	20.81	35.04	47.41	61.55	68.29	69.29	59.60	44.04	29.39	16.82	12.99	480.23
1605277012	206 S DOUGLAS ST	158.61	21.37	31.10	51.89	64.58	78.79	84.80	87.29	79.87	65.00	45.36	24.52	18.15	652.72
1605277013	208 S DOUGLAS ST	214.62	18.87	25.77	41.17	52.64	67.99	75.10	76.18	65.44	50.41	36.32	21.22	16.41	547.53
1605277013_a	208 S DOUGLAS ST	103.67	10.73	15.82	27.67	39.47	52.72	58.92	59.49	50.03	35.54	22.48	12.23	9.10	394.20
1605277014	216 S DOUGLAS ST	179.28	20.08	28.94	48.65	62.09	76.81	82.96	85.23	76.87	61.03	42.03	22.92	17.15	624.75
1605277015	220 S DOUGLAS ST	192.36	21.50	31.48	54.49	70.99	88.07	95.79	98.37	88.67	69.26	45.86	24.62	18.11	707.21
1605277016	228 S DOUGLAS ST	243.40	18.56	27.25	47.25	62.06	78.41	85.82	87.54	77.12	59.53	39.45	21.14	15.81	619.94
1605277017	234 S DOUGLAS ST	135.13	22.49	31.76	51.55	62.38	74.60	79.96	82.52	76.43	63.87	45.99	25.77	19.18	636.50
1605277018	238 S DOUGLAS ST	224.67	20.66	29.67	48.78	61.38	76.00	82.54	84.45	75.72	60.74	42.93	23.60	17.65	624.12
1605277019	244 S DOUGLAS ST	210.56	16.73	25.51	47.02	64.71	81.55	89.01	91.23	81.44	60.99	37.36	19.17	14.10	628.82
1605277020	252 S DOUGLAS ST	145.80	24.98	35.43	56.77	69.04	83.85	90.44	92.87	84.49	69.93	50.95	28.62	21.38	708.74
1605277021	258 S DOUGLAS ST	159.39	15.03	20.90	34.66	48.43	64.29	71.68	72.36	60.90	43.51	29.11	16.89	12.90	490.64
1605277022	266 S DOUGLAS ST	140.64	19.92	28.59	48.16	59.45	71.07	75.94	78.56	73.11	60.60	41.94	22.80	17.08	597.22
1605277023	1205 E 300 S	241.42	19.96	28.60	47.38	61.25	77.43	84.44	86.21	76.39	59.38	41.11	22.80	16.90	621.84
1605277024	1215 E 300 S	202.49	20.07	28.91	47.93	61.84	78.07	85.26	86.90	76.65	59.83	41.34	22.87	17.24	626.91
1605277025	1223 E 300 S	140.23	21.66	29.59	48.94	63.18	79.55	86.75	88.40	78.11	61.07	42.26	24.29	18.90	642.70
1605277026	1227 E 300 S	147.10	17.89	24.95	42.74	57.92	75.15	82.99	84.39	72.79	53.79	35.57	20.06	15.55	583.80
1605277027	1231 E 300 S	145.35	17.69	25.37	44.03	59.68	77.20	85.07	86.47	74.91	55.79	36.28	20.00	15.23	597.73
1605278001	1246 E 200 S	199.26	19.40	27.44	45.56	58.00	73.61	80.57	81.90	71.47	56.41	39.35	21.93	16.71	592.36
1605278001_a	1246 E 200 S	113.51	20.79	30.45	50.83	65.50	82.11	89.45	91.65	81.81	63.66	43.94	23.88	17.54	661.61
1605278002	209 S DOUGLAS ST	154.51	25.22	35.27	57.74	74.62	93.85	102.32	104.69	92.89	72.18	50.19	28.59	21.56	759.13
1605278003	215 S DOUGLAS ST	185.68	23.65	33.47	54.77	68.05	83.68	90.29	92.63	83.81	68.10	48.33	26.91	20.37	694.07
1605278004	219 S DOUGLAS ST	204.66	21.28	30.56	51.15	65.05	79.21	85.37	87.92	80.55	64.56	44.55	24.33	18.11	652.64
1605278005	227 S DOUGLAS ST	232.91	17.66	26.98	46.38	61.82	79.97	88.47	89.86	77.44	58.01	38.74	20.39	14.70	620.41
1605278006	233 S DOUGLAS ST	132.12	12.61	19.42	37.31	55.48	72.59	80.12	81.81	70.96	49.28	28.06	14.32	10.64	532.61
1605278007	239 S DOUGLAS ST	221.50	10.47	16.20	30.54	43.60	57.20	63.21	64.26	55.09	39.46	23.62	11.98	8.81	424.43

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1605278008	241 S DOUGLAS ST	124.76	20.41	30.56	52.25	63.15	74.71	79.87	83.00	78.27	65.99	45.76	23.86	16.89	634.69
1605278009	249 S DOUGLAS ST	181.31	19.47	27.42	46.24	60.13	75.68	82.39	84.16	74.80	57.94	39.42	21.99	16.82	606.44
1605278009_a	249 S DOUGLAS ST	111.38	16.38	24.91	44.76	61.98	80.84	89.40	90.91	78.22	57.08	35.98	18.76	13.77	612.98
1605278010	255 S DOUGLAS ST	173.31	20.64	30.00	50.70	64.60	80.39	87.47	89.80	80.48	64.03	43.59	23.71	17.45	652.86
1605278011	259 S DOUGLAS ST	190.88	20.07	29.74	49.65	63.84	79.74	86.66	88.64	79.24	62.32	43.01	23.11	17.08	643.10
1605278012	275 S DOUGLAS ST	327.75	23.57	33.14	54.81	69.69	86.35	93.71	96.14	86.55	68.71	47.87	26.75	20.28	707.58
1605278013	1259 E 300 S # NFF1	82.20	22.69	32.88	56.10	72.51	90.82	99.05	101.44	90.27	70.66	47.70	25.90	19.26	729.28
1605278014	1264 E 200 S	129.67	19.03	29.54	51.23	67.11	84.41	92.09	94.13	83.79	64.77	43.07	22.17	15.67	667.01
1605278015	1268 E 200 S	390.54	23.35	33.89	56.82	73.08	91.50	99.56	101.82	90.87	71.30	48.99	26.69	19.78	737.64
1605278016	208-212 S 1300 E	183.07	16.81	25.50	45.12	58.48	71.53	77.18	79.69	73.11	57.72	37.92	19.47	14.08	576.61
1605278016_a	208-212 S 1300 E	104.09	24.13	33.86	55.31	69.17	84.95	91.65	94.03	85.22	68.95	48.81	27.42	20.75	704.26
1605278017	216 S 1300 E	183.44	25.49	34.48	53.34	62.51	73.28	77.55	80.54	76.37	65.91	49.72	29.00	22.13	650.31
1605278018	222 S 1300 E	348.83	21.51	32.04	56.71	75.37	95.08	103.82	106.16	94.31	72.23	46.85	24.60	18.18	746.87
1605278019	224 S 1300 E	326.65	19.03	27.68	47.41	61.37	77.09	84.04	85.87	76.29	59.55	40.28	21.70	16.24	616.56
1605278020	226 S 1300 E	283.16	20.77	31.45	55.25	72.23	90.12	98.69	100.96	90.18	70.22	46.12	23.97	17.37	717.34
1605278021	238 S 1300 E	408.08	24.65	34.63	56.69	71.40	88.25	95.58	97.96	88.09	70.57	49.78	28.00	21.15	726.74
1605278023	252 S 1300 E	210.48	21.06	31.15	52.17	66.58	82.46	89.41	91.58	82.33	65.36	45.07	24.32	17.56	669.05
1605278024	258 S 1300 E	358.21	25.73	33.15	49.84	63.46	79.22	85.41	87.23	77.87	61.19	45.87	28.66	22.77	660.40
1605278027	1259 E 300 S	210.35	18.45	27.64	48.72	65.42	83.51	91.63	93.43	81.82	61.84	40.13	21.12	15.57	649.27
1605278029	280 S 1300 E	455.06	21.59	31.83	54.01	70.14	88.12	96.06	98.18	87.39	68.08	46.13	24.79	18.26	704.59
1605279001	1310 E 200 S	419.66	26.66	37.26	60.48	75.86	93.77	101.45	103.88	93.40	75.09	53.58	30.19	22.96	774.60
1605279002	215 S 1300 E	507.73	22.73	33.23	56.63	73.34	91.99	100.54	102.88	91.46	71.41	48.26	25.98	19.28	737.74
1605279003	221 S 1300 E	193.90	8.58	12.73	27.64	46.45	67.06	76.58	76.57	60.57	36.77	17.83	9.33	7.45	447.54
1605279005	235-255 S 1300 E	594.86	24.37	34.39	56.54	71.06	87.42	94.61	97.20	88.12	70.87	49.75	27.76	20.83	722.92
1605279006	273 S 1300 E	323.62	20.56	30.34	52.47	68.70	86.54	94.62	96.80	85.90	66.07	44.15	23.53	17.33	687.02
1605279008	227 S 1300 E # 1	414.24	26.14	36.95	60.35	76.22	94.65	102.70	105.09	94.28	75.29	53.05	29.72	22.34	776.77
1605279008_a	227 S 1300 E # 1	263.22	21.08	31.46	55.15	72.62	91.03	99.20	101.62	90.56	69.89	45.88	24.22	17.71	720.43
1605279009	227-231 S 1300 E	151.37	10.27	16.54	33.74	51.83	71.25	80.61	81.59	67.63	44.88	24.40	11.75	8.59	503.08

Roof ID	Address	Area meters²	Jan kWh/m²	Feb kWh/m²	Mar kWh/m²	Apr kWh/m²	May kWh/m²	Jun kWh/m²	Jul kWh/m²	Aug kWh/m²	Sep kWh/m²	Oct kWh/m²	Nov kWh/m²	Dec kWh/m²	Annual kWh/m²
1605280001	305 S 1200 E	185.54	15.25	21.24	34.50	44.24	56.22	61.75	62.57	54.22	42.32	29.96	17.20	13.19	452.65
1605280001_a	305 S 1200 E	114.73	19.68	27.96	45.85	55.57	65.50	70.00	72.47	68.22	57.43	40.97	22.65	16.72	563.03
1605280002	1224 E 300 S	248.14	13.87	20.28	34.21	46.35	61.74	69.04	69.52	58.03	42.27	28.65	15.78	11.72	471.46
1605280003	1228 E 300 S	158.89	8.82	13.05	23.47	37.14	58.09	67.95	66.78	48.24	28.76	17.24	9.71	7.57	386.82
1605280004	306 S DOUGLAS ST	145.17	17.14	24.85	40.80	52.39	66.72	73.31	74.19	64.45	49.87	35.21	19.56	14.51	532.98
1605280005	315 S 1200 E	347.28	14.51	21.40	37.80	52.36	68.64	76.38	77.65	66.68	48.25	30.92	16.55	12.28	523.42
1605280008	316 S DOUGLAS ST	133.64	17.19	25.02	43.79	60.81	79.60	88.49	90.08	77.34	56.19	35.77	19.54	14.63	608.45
1605281001	1250-1252 E 300 S	229.53	20.90	29.97	50.17	64.65	80.82	87.65	89.83	80.23	62.72	43.07	23.79	17.98	651.78
1605281002	305 S DOUGLAS ST	217.70	19.48	28.22	47.54	60.51	74.58	80.81	82.85	74.74	59.73	40.93	22.21	16.72	608.32
1605281003	315 S DOUGLAS ST	238.97	19.26	27.45	45.85	59.89	77.07	85.29	86.56	74.51	56.93	39.14	21.83	16.51	610.29
1605281004	304 S 1300 E	251.66	22.41	32.45	54.03	66.46	79.38	85.04	87.74	81.52	67.62	47.44	25.71	19.07	668.86
1605281005	310 S 1300 E	215.98	16.84	24.71	44.14	59.58	77.94	86.58	87.82	74.95	55.55	35.77	19.05	14.37	597.29
1605281006	316 S 1300 E	206.88	22.71	32.24	53.60	66.19	80.28	86.33	89.01	81.70	66.82	47.08	25.87	19.48	671.32
1605282002	1314 E 300 S	151.17	23.64	32.53	52.98	66.96	83.04	90.29	92.37	82.77	66.05	46.58	26.69	20.52	684.43
1605282003	309-311 S 1300 E	139.28	16.78	23.72	38.98	51.18	64.71	70.61	71.95	63.38	48.61	33.68	18.99	14.38	516.96
1605282003_a	309-311 S 1300 E	88.25	12.22	20.68	38.41	51.06	65.55	72.43	73.89	64.32	48.63	31.05	14.45	9.97	502.65
1605282004	315-319 S 1300 E	205.01	19.04	25.43	42.90	57.16	71.95	78.24	80.19	71.34	54.44	36.07	21.18	16.73	574.65
1605282004_a	315-319 S 1300 E	114.70	18.30	28.56	50.83	64.94	78.27	84.06	86.99	80.67	65.13	42.68	21.34	15.23	637.00
1605282005	303-305 S 1300 E	157.32	19.65	26.91	43.70	55.02	67.84	73.15	75.01	67.56	54.06	38.34	22.18	17.00	560.42
1605427001	321 S 1200 E	157.19	17.60	25.44	43.07	56.54	70.77	77.09	79.01	70.59	54.73	36.74	20.08	15.03	566.69
1605427002	327 S 1200 E	145.37	17.41	24.09	40.91	54.92	71.19	78.70	80.00	68.91	51.35	34.19	19.51	15.15	556.33
1605427003	333 S 1200 E	151.68	19.37	26.77	43.84	57.16	71.60	78.02	80.00	71.44	55.10	38.30	21.89	16.84	580.34
1605427004	337 S 1200 E	168.40	19.60	28.38	48.40	63.49	80.40	88.19	90.11	79.36	60.88	40.99	22.32	16.71	638.84
1605427005	343 S 1200 E	258.51	19.86	29.03	49.17	63.14	78.87	85.89	88.01	78.57	61.57	42.16	22.73	16.85	635.85
1605427006	351 S 1200 E	193.22	15.97	23.72	42.02	56.84	73.14	80.73	82.07	71.31	53.27	34.42	18.23	13.45	565.17
1605427007	357 S 1200 E	175.00	9.60	16.25	34.44	51.85	69.70	77.99	79.06	66.61	45.68	24.44	10.95	8.06	494.63
1605427009	322 S DOUGLAS ST	184.05	24.45	34.35	57.69	72.59	89.33	96.60	99.27	89.89	72.35	50.02	27.71	21.08	735.34
1605427010	330 S DOUGLAS ST	249.21	21.44	29.91	48.97	63.73	81.31	89.43	91.29	79.86	61.14	42.52	24.28	18.46	652.32

Roof ID	Address	Area meters²	Jan kWh/m²	Feb kWh/m²	Mar kWh/m²	Apr kWh/m²	May kWh/m²	Jun kWh/m²	Jul kWh/m²	Aug kWh/m²	Sep kWh/m²	Oct kWh/m²	Nov kWh/m²	Dec kWh/m²	Annual kWh/m²
1605427011	334 S DOUGLAS ST	198.11	21.35	29.60	49.23	61.62	75.32	81.30	83.33	75.57	61.25	42.74	24.11	18.45	623.87
1605427012	336 S DOUGLAS ST	186.12	22.17	30.81	49.68	63.33	78.31	84.64	87.01	78.63	62.19	43.95	25.28	18.84	644.84
1605427013	342 S DOUGLAS ST	185.22	20.38	28.13	46.71	60.51	76.38	83.59	85.28	75.18	58.50	40.17	22.93	17.77	615.53
1605427014	348 S DOUGLAS ST	265.35	20.84	29.41	49.42	64.26	81.15	88.44	90.44	79.99	61.85	42.37	23.53	18.07	649.78
1605427015	358 S DOUGLAS ST	199.28	24.14	34.48	57.55	72.33	88.23	94.95	97.84	89.50	72.31	50.07	27.59	20.51	729.49
1605427015_a	358 S DOUGLAS ST	105.73	18.55	27.84	50.09	67.53	85.02	92.98	95.39	85.14	64.36	40.86	21.18	15.73	664.67
1605427016	364 S DOUGLAS ST	218.76	19.90	29.26	49.70	64.71	82.08	90.12	91.93	80.72	62.37	42.22	22.85	16.74	652.60
1605427017	1203 E 400 S	167.59	18.87	26.33	42.45	52.98	64.82	70.10	71.90	65.24	52.98	37.83	21.46	16.27	541.23
1605427018	1209 E 400 S	162.26	21.43	28.87	44.94	53.91	64.27	68.65	70.99	66.28	55.75	41.53	24.27	18.70	559.57
1605427019	1215 E 400 S	153.51	19.76	29.12	50.20	65.63	82.83	90.92	92.91	81.99	63.47	42.28	22.63	16.76	658.51
1605427020	1219 E 400 S	111.51	16.56	25.32	44.69	60.13	76.73	84.63	86.18	75.37	57.08	36.84	19.18	13.68	596.40
1605427021	1225 E 400 S	122.95	16.43	24.07	42.64	57.63	73.73	81.13	82.56	71.97	54.15	34.79	18.68	13.91	571.68
1605427022	1231 E 400 S	110.20	16.01	22.84	38.91	52.32	66.70	73.30	75.02	66.13	49.70	32.88	18.21	13.71	525.72
1605428001	319 S DOUGLAS ST	186.93	19.41	30.26	51.20	64.85	80.01	86.72	89.19	80.76	64.25	44.35	22.72	16.16	649.89
1605428002	327 S DOUGLAS ST	228.20	13.01	19.49	36.49	53.45	70.92	78.76	80.13	68.29	47.41	28.02	14.64	11.15	521.75
1605428003	333 S DOUGLAS ST	157.03	17.72	25.73	42.02	52.53	64.83	70.27	71.81	64.30	51.81	36.92	20.35	15.01	533.30
1605428004	339 S DOUGLAS ST	191.50	19.61	27.34	45.27	59.13	74.58	81.88	83.65	74.01	56.93	39.09	22.21	16.83	600.54
1605428005	345 S DOUGLAS ST	193.03	19.39	26.92	45.54	58.99	73.97	80.62	82.24	72.78	57.01	38.66	21.79	16.85	594.76
1605428006	351 S DOUGLAS ST	203.53	16.18	23.18	39.12	52.71	67.97	74.84	76.05	65.81	49.30	32.86	18.40	13.77	530.18
1605428007	355 S DOUGLAS ST	220.88	16.90	24.26	41.83	55.53	71.01	78.08	79.73	69.80	53.10	35.09	19.17	14.50	558.99
1605428007_a	355 S DOUGLAS ST	111.24	13.35	20.65	38.44	54.73	72.07	80.22	81.20	69.16	49.55	30.03	15.28	11.23	535.90
1605428008	363 S DOUGLAS ST	117.65	22.77	31.34	51.43	63.61	76.74	82.26	84.93	78.46	64.42	45.51	25.75	19.78	646.99
1605428009	371 S DOUGLAS ST	137.14	16.13	25.37	46.35	63.03	80.94	89.48	91.20	79.56	59.19	37.19	18.70	13.27	620.40
1605428010	1253 E 400 S	197.39	23.60	32.76	53.31	66.70	81.53	87.87	90.37	82.33	66.52	47.08	26.77	20.34	679.18
1605428011	322 S 1300 E	193.13	22.85	31.91	52.70	67.30	84.75	92.60	94.59	83.50	65.47	45.78	25.83	19.73	686.99
1605428012	330 S 1300 E	253.63	22.67	32.38	54.14	69.71	87.40	95.19	97.34	86.53	67.73	46.61	25.79	19.39	704.88
1605428013	334 S 1300 E	283.91	21.77	30.80	52.14	67.34	84.14	91.64	93.71	83.53	65.56	44.34	24.62	18.82	678.40
1605428014	340 S 1300 E	229.82	22.25	33.05	56.35	71.88	89.17	97.09	99.41	89.01	70.70	48.16	25.63	18.67	721.38

Roof ID	Address	Area meters²	Jan kWh/m²	Feb kWh/m²	Mar kWh/m²	Apr kWh/m²	May kWh/m²	Jun kWh/m²	Jul kWh/m²	Aug kWh/m²	Sep kWh/m²	Oct kWh/m²	Nov kWh/m²	Dec kWh/m²	Annual kWh/m²
1605428015	344 S 1300 E	139.62	23.52	33.45	55.00	69.46	85.69	92.73	95.09	85.87	68.95	48.26	26.83	20.06	704.90
1605428016	354 S 1300 E	245.25	15.31	24.59	46.28	63.97	82.37	90.83	92.42	80.38	59.52	36.26	17.69	12.72	622.34
1605428017	360 S 1300 E	175.70	23.42	32.68	52.27	64.11	77.16	82.77	85.55	79.19	65.12	47.17	26.78	20.05	656.27
1605428018	364 S 1300 E	225.05	22.27	32.21	53.80	67.91	84.02	91.32	93.67	84.23	67.39	46.83	25.46	18.99	688.08
1605428020	1259 E 400 S	106.37	20.99	30.14	50.87	65.67	81.39	88.41	90.66	81.54	64.23	43.53	23.86	18.04	659.33
1605428021	1263-1265 S 400 E	204.35	16.82	25.52	45.39	61.61	79.35	87.38	88.96	77.43	57.85	37.10	19.35	14.07	610.84
1605428022	1271 E 400 S	186.40	18.89	26.83	46.45	61.61	78.47	86.24	87.84	76.80	58.65	38.52	21.28	16.30	617.88
1605428023	378 S 1300 E	267.55	15.39	24.17	43.61	58.39	74.22	81.29	83.04	73.13	55.42	35.60	17.84	12.78	574.89
1605428024	1255-1261 E 400 S	138.54	24.09	33.97	57.29	73.21	90.47	98.14	100.81	91.00	72.16	49.28	27.27	20.77	738.47
1605428025	1255-1261 E 400 S	133.88	15.96	25.24	46.04	62.82	80.13	87.92	89.94	79.27	59.29	37.35	18.60	13.27	615.82
1605429001	327 S 1300 E	146.18	18.13	26.82	46.49	59.66	74.26	80.77	82.71	74.03	58.42	39.33	20.73	15.53	596.89
1605429001_a	327 S 1300 E	125.90	17.12	26.27	45.66	57.71	69.58	74.65	77.34	72.02	58.17	39.23	20.00	14.25	571.99
1605429002	333 S 1300 E	121.42	10.66	15.41	27.44	40.46	57.76	66.53	66.26	51.70	34.55	21.18	11.97	9.00	412.94
1605429003	339 S 1300 E	132.61	10.69	16.24	29.95	44.70	60.11	67.22	68.12	57.52	39.31	23.30	12.19	9.00	438.35
1605429004	343 S 1300 E	104.49	23.71	30.88	48.68	61.87	76.73	82.95	84.75	75.81	60.38	43.25	26.43	20.87	636.31
1605429006	355 S 1300 E	167.52	22.88	32.06	52.62	65.73	80.34	86.82	89.13	80.90	65.48	46.10	25.96	19.65	667.65
1605429007	357 S 1300 E	116.32	19.79	27.23	44.06	56.45	70.79	77.24	78.82	69.64	54.70	38.64	22.33	17.19	576.87
1605429008	361 S 1300 E	235.94	21.13	30.42	51.10	64.51	79.59	86.24	88.64	80.20	64.11	44.40	24.16	18.00	652.52
1605429009	367-369 S 1300 E	147.06	21.95	29.91	48.15	60.79	75.36	81.60	83.43	74.77	59.81	42.42	24.73	19.08	622.01
1605429011	1303 E 400 S	190.04	20.28	29.68	50.46	64.81	80.30	87.15	89.47	80.61	63.79	43.15	23.30	17.09	650.10
1605429012	1309 E 400 S	179.59	18.95	28.40	48.89	64.35	81.62	89.32	91.29	80.48	61.49	41.08	21.84	15.91	643.61
1605429013	1311 E 400 S	132.92	17.04	25.50	44.34	59.29	76.40	84.16	85.62	74.33	56.17	36.74	19.56	14.36	593.52
1605429014	351 S 1300 E	150.10	19.59	27.80	48.04	63.46	79.45	86.69	88.80	79.24	61.21	40.23	22.21	16.85	633.57

Table 2 shows estimated daily average solar insolation per month, minimum and maximum solar insolation per month, and it indicates the month when the minimum and maximum daily average occurs. Values are shown as kilowatt hours per meter square. Roof IDs are equal to county parcel IDs. Multiple roofs within a single parcel are identified with an "_a" at the end of the roof ID.

Roof ID	Location	Area meter²	Jan kWh/m²	Feb kWh/m²	Mar kWh/m²	Apr kWh/m²	May kWh/m²	Jun kWh/m²	Jul kWh/m²	Aug kWh/m²	Sep kWh/m²	Oct kWh/m²	Nov kWh/m²	Dec kWh/m²	Max kWh/m²	Max Month	Min kWh/m²	Min Month
1604151001	1318 E 200 S	143.68	1.51	2.31	3.36	4.28	5.04	5.61	5.59	5.10	4.30	3.01	1.77	1.30	5.61	Jun	1.30	Dec
1604151004	206 S UNIVERSITY ST	650.50	1.65	2.66	4.00	5.27	6.35	7.14	7.08	6.34	5.18	3.48	1.96	1.39	7.14	Jun	1.39	Dec
1604151005	220 S UNIVERSITY ST	147.11	0.54	0.94	1.67	2.73	3.77	4.42	4.27	3.41	2.24	1.19	0.63	0.46	4.42	Jun	0.46	Dec
1604151006	222 S UNIVERSITY ST	128.65	0.88	1.35	2.09	3.07	3.97	4.58	4.51	3.83	2.77	1.72	1.02	0.76	4.58	Jun	0.76	Dec
1604151007	232 S UNIVERSITY ST	243.67	1.23	1.95	2.94	3.96	4.82	5.44	5.39	4.80	3.84	2.54	1.45	1.04	5.44	Jun	1.04	Dec
1604151008	240 S UNIVERSITY ST	110.81	1.44	2.23	3.27	4.20	4.95	5.49	5.47	5.02	4.22	2.91	1.69	1.24	5.49	Jun	1.24	Dec
1604151011	252 S UNIVERSITY ST	209.30	1.45	2.26	3.41	4.51	5.43	6.09	6.04	5.42	4.41	2.94	1.69	1.24	6.09	Jun	1.24	Dec
1604151014	264 S UNIVERSITY ST	336.20	1.39	2.30	3.54	4.63	5.54	6.22	6.17	5.54	4.59	3.03	1.66	1.15	6.22	Jun	1.15	Dec
1604151015	274 S UNIVERSITY ST	1414.89	1.33	2.17	3.37	4.54	5.51	6.22	6.16	5.47	4.40	2.84	1.57	1.12	6.22	Jun	1.12	Dec
1604151016	248 S UNIVERSITY ST	224.64	1.36	2.19	3.38	4.50	5.44	6.13	6.06	5.40	4.38	2.87	1.60	1.16	6.13	Jun	1.16	Dec
1604151017	258 S UNIVERSITY ST	225.19	1.48	2.35	3.55	4.64	5.57	6.26	6.21	5.57	4.58	3.06	1.75	1.26	6.26	Jun	1.26	Dec
1604151018	1320 E 200 S # C	473.30	1.68	2.64	3.93	5.14	6.13	6.87	6.83	6.17	5.08	3.45	1.98	1.43	6.87	Jun	1.43	Dec
1604152001	1318 E 300 S	154.89	1.49	2.29	3.37	4.39	5.27	5.91	5.86	5.26	4.35	2.96	1.74	1.28	5.91	Jun	1.28	Dec
1604152002	1330 E 300 S	157.33	1.13	1.83	2.84	3.84	4.77	5.43	5.35	4.66	3.69	2.40	1.34	0.96	5.43	Jun	0.96	Dec
1604152003	1336-1338 E 300 S	191.71	1.28	2.11	3.31	4.50	5.52	6.25	6.18	5.44	4.31	2.76	1.51	1.08	6.25	Jun	1.08	Dec
1604152004	1342 E 300 S	169.11	1.10	1.80	2.79	3.80	4.67	5.28	5.22	4.59	3.64	2.35	1.30	0.94	5.28	Jun	0.94	Dec
1604152005	316 S UNIVERSITY ST	115.59	1.50	2.38	3.67	4.78	5.63	6.29	6.27	5.74	4.79	3.14	1.77	1.26	6.29	Jun	1.26	Dec
1604152006	316 S UNIVERSITY ST	152.38	1.23	2.02	3.11	4.01	4.64	5.14	5.16	4.81	4.07	2.70	1.47	1.04	5.16	Jul	1.04	Dec
1604301007	322 S UNIVERSITY ST	147.25	1.65	2.55	3.73	4.85	5.82	6.54	6.48	5.80	4.79	3.30	1.93	1.42	6.54	Jun	1.42	Dec
1604301008	328 S UNIVERSITY ST	88.20	0.53	0.86	1.37	2.14	3.03	3.61	3.44	2.62	1.76	1.05	0.60	0.45	3.61	Jun	0.45	Dec
1604301009	332 S UNIVERSITY ST	167.63	0.92	1.80	3.03	4.10	4.98	5.63	5.56	4.95	3.97	2.45	1.14	0.73	5.63	Jun	0.73	Dec
1604301010	340 S UNIVERSITY ST	116.45	0.55	0.85	1.37	2.55	3.82	4.59	4.38	3.23	1.81	0.96	0.61	0.48	4.59	Jun	0.48	Dec
1604301011	346 S UNIVERSITY ST	196.91	1.61	2.47	3.52	4.20	4.67	5.06	5.11	4.95	4.50	3.27	1.91	1.39	5.11	Jul	1.39	Dec
1604301013	356 S UNIVERSITY ST	182.46	1.31	2.03	3.03	3.97	4.74	5.29	5.25	4.74	3.91	2.63	1.53	1.12	5.29	Jun	1.12	Dec

Roof ID	Location	Area meter²	Jan kWh/m²	Feb kWh/m²	Mar kWh/m²	Apr kWh/m²	May kWh/m²	Jun kWh/m²	Jul kWh/m²	Aug kWh/m²	Sep kWh/m²	Oct kWh/m²	Nov kWh/m²	Dec kWh/m²	Max kWh/m²	Max Month	Min Month	Min Month
1604301014	362 S UNIVERSITY ST	134.50	1.22	1.88	2.80	3.66	4.39	4.92	4.87	4.36	3.61	2.44	1.43	1.06	4.92	Jun	1.06	Dec
1604301015	368 S UNIVERSITY ST	118.70	1.27	2.20	3.60	4.95	6.01	6.78	6.72	5.99	4.75	2.94	1.52	1.04	6.78	Jun	1.04	Dec
1604301016	1319 E 400 S	95.56	0.78	1.41	2.45	3.60	4.58	5.25	5.17	4.44	3.29	1.88	0.93	0.64	5.25	Jun	0.64	Dec
1604301017	1321 E 400 S	72.24	0.61	1.17	2.20	3.39	4.46	5.19	5.08	4.21	2.96	1.58	0.74	0.50	5.19	Jun	0.50	Dec
1604301018	1327 E 400 S	117.65	0.87	1.50	2.50	3.52	4.33	4.92	4.87	4.31	3.34	2.01	1.04	0.72	4.92	Jun	0.72	Dec
1604301019	1333 E 400 S	108.71	1.31	2.13	3.35	4.63	5.74	6.51	6.42	5.61	4.38	2.78	1.54	1.10	6.51	Jun	1.10	Dec
1604301020	1337 E 400 S	113.07	1.14	1.75	2.65	3.63	4.46	5.05	4.98	4.37	3.43	2.25	1.32	0.99	5.05	Jun	0.99	Dec
1604301026	348 S UNIVERSITY ST	171.64	1.34	2.12	3.24	4.25	5.08	5.71	5.66	5.10	4.22	2.80	1.57	1.15	5.71	Jun	1.15	Dec
1604301027	352 S UNIVERSITY ST	171.23	1.26	1.95	2.97	4.05	4.99	5.66	5.58	4.88	3.86	2.51	1.46	1.08	5.66	Jun	1.08	Dec
1605127005	35 S 900 E	1386.33	1.09	1.81	2.92	4.08	5.07	5.78	5.71	4.99	3.84	2.38	1.29	0.92	5.78	Jun	0.92	Dec
1605127007	41 S 900 E	834.27	1.29	2.12	3.30	4.46	5.40	6.10	6.05	5.42	4.33	2.80	1.54	1.08	6.10	Jun	1.08	Dec
1605127009	59 S 900 E	146.47	0.89	1.66	2.80	3.90	4.79	5.48	5.42	4.78	3.74	2.26	1.08	0.72	5.48	Jun	0.72	Dec
1605127010	63 S 900 E	126.36	0.76	1.37	2.34	3.37	4.21	4.81	4.75	4.14	3.16	1.83	0.92	0.62	4.81	Jun	0.62	Dec
1605127017	12 S HAXTON PL	142.49	0.90	1.38	2.14	3.07	3.89	4.46	4.39	3.77	2.82	1.75	1.04	0.78	4.46	Jun	0.78	Dec
1605127018	16 S HAXTON PL	142.83	1.27	2.07	3.09	4.00	4.74	5.27	5.26	4.80	3.97	2.71	1.51	1.08	5.27	Jun	1.08	Dec
1605127019	22 S HAXTON PL	118.49	1.16	1.80	2.89	4.12	5.01	5.63	5.61	5.04	3.87	2.35	1.34	1.00	5.63	Jun	1.00	Dec
1605127020	32 S HAXTON PL	134.79	0.99	1.69	2.90	4.20	5.18	5.84	5.80	5.15	3.92	2.27	1.17	0.83	5.84	Jun	0.83	Dec
1605127021	35 S HAXTON PL	194.09	1.29	1.94	2.80	3.66	4.38	4.90	4.86	4.37	3.59	2.49	1.50	1.12	4.90	Jun	1.12	Dec
1605127027	927 E 100 S	181.32	0.60	1.03	1.74	2.63	3.44	3.99	3.90	3.25	2.32	1.34	0.71	0.51	3.99	Jun	0.51	Dec
1605127027_a	945 E 100 S	98.42	1.01	1.74	2.85	3.94	4.83	5.50	5.45	4.82	3.78	2.33	1.21	0.83	5.50	Jun	0.83	Dec
1605127028_a	945 E 100 S	104.66	1.21	2.02	3.14	4.22	5.12	5.77	5.74	5.13	4.12	2.68	1.45	1.00	5.77	Jun	1.00	Dec
1605127028	945 E 100 S	211.17	1.04	1.68	2.69	3.76	4.72	5.39	5.30	4.57	3.53	2.20	1.22	0.89	5.39	Jun	0.89	Dec
1605127029	919 E 100 S	147.49	1.18	1.79	2.61	3.35	3.93	4.36	4.35	3.99	3.35	2.32	1.38	1.02	4.36	Jun	1.02	Dec
1605127030	921 E 100 S	115.08	0.90	1.49	2.26	2.93	3.47	3.88	3.87	3.51	2.93	1.98	1.08	0.75	3.88	Jun	0.75	Dec
1605127033	75 S 900 E	197.28	1.41	2.18	3.14	3.90	4.51	5.00	5.01	4.67	4.04	2.87	1.67	1.21	5.01	Jul	1.21	Dec
1605128001	3-5 S HAXTON PL	194.93	1.19	1.91	2.96	4.04	5.01	5.73	5.64	4.90	3.84	2.48	1.40	1.02	5.73	Jun	1.02	Dec
1605128002	19 S HAXTON PL	234.08	0.63	1.03	1.74	2.89	4.00	4.70	4.56	3.63	2.35	1.30	0.72	0.54	4.70	Jun	0.54	Dec
1605128002_a	19 S HAXTON PL	102.30	0.61	1.25	2.50	3.65	4.51	5.13	5.10	4.51	3.44	1.80	0.75	0.49	5.13	Jun	0.49	Dec

Roof ID	Location	Area meter²	Jan kWh/m²	Feb kWh/m²	Mar kWh/m²	Apr kWh/m²	May kWh/m²	Jun kWh/m²	Jul kWh/m²	Aug kWh/m²	Sep kWh/m²	Oct kWh/m²	Nov kWh/m²	Dec kWh/m²	Max kWh/m²	Max Month	Min kWh/m²	Min Month
1605128003	31 S HAXTON PL	171.40	1.28	1.95	2.88	3.89	4.81	5.53	5.43	4.72	3.72	2.50	1.49	1.11	5.53	Jun	1.11	Dec
1605128004	35 S HAXTON PL	196.82	1.21	1.81	2.62	3.46	4.21	4.74	4.69	4.16	3.36	2.32	1.41	1.06	4.74	Jun	1.06	Dec
1605128006	951 E 100 S	1986.43	1.52	2.43	3.75	5.05	6.17	6.98	6.90	6.10	4.88	3.18	1.79	1.29	6.98	Jun	1.29	Dec
1605128007	966 E SOUTHTEMPLE ST	230.46	1.23	1.89	2.80	3.71	4.53	5.12	5.05	4.46	3.59	2.44	1.43	1.06	5.12	Jun	1.06	Dec
1605128008	974 E SOUTHTEMPLE ST	219.37	1.28	1.94	2.90	3.90	4.75	5.36	5.30	4.69	3.76	2.49	1.48	1.12	5.36	Jun	1.12	Dec
1605128008_a	974 E SOUTHTEMPLE ST	212.93	1.32	2.23	3.44	4.60	5.56	6.28	6.22	5.55	4.48	2.95	1.59	1.10	6.28	Jun	1.10	Dec
1605128009_a	24-26 S 1000 E	129.94	0.68	1.21	2.26	3.52	4.53	5.25	5.15	4.37	3.13	1.63	0.81	0.56	5.25	Jun	0.56	Dec
1605128009	24-26 S 1000 E	193.27	1.27	1.94	3.06	4.22	5.14	5.79	5.74	5.11	4.04	2.52	1.47	1.11	5.79	Jun	1.11	Dec
1605128010	30 S 1000 E	159.05	1.14	1.78	2.68	3.52	4.24	4.80	4.73	4.18	3.44	2.31	1.33	0.99	4.80	Jun	0.99	Dec
1605128011	34 S 1000 E	216.12	1.11	1.90	3.06	4.16	5.08	5.78	5.73	5.06	4.03	2.53	1.34	0.92	5.78	Jun	0.92	Dec
1605128012	38 S 1000 E	133.16	1.34	2.08	3.07	3.99	4.71	5.24	5.21	4.76	3.95	2.71	1.58	1.15	5.24	Jun	1.15	Dec
1605128014	50-52 S 1000 E	99.03	0.74	1.18	1.78	2.82	3.96	4.70	4.52	3.52	2.26	1.42	0.86	0.62	4.70	Jun	0.62	Dec
1605128015	58 S 1000 E	368.55	1.03	1.76	2.87	4.07	5.12	5.85	5.76	4.98	3.79	2.32	1.22	0.87	5.85	Jun	0.87	Dec
1605128015_a	58 S 1000 E	124.28	0.70	1.21	2.11	3.18	4.04	4.65	4.58	3.94	2.87	1.61	0.83	0.58	4.65	Jun	0.58	Dec
1605128016	64 S 1000 E	129.53	1.39	2.11	3.11	3.95	4.59	5.10	5.10	4.72	4.03	2.76	1.63	1.21	5.10	Jun	1.21	Dec
1605128017	955 E 100 S	171.44	1.18	1.88	2.92	4.00	4.93	5.59	5.51	4.83	3.83	2.45	1.39	1.01	5.59	Jun	1.01	Dec
1605128019	975 E 100 S	213.93	1.39	2.18	3.25	4.31	5.21	5.85	5.80	5.18	4.22	2.83	1.63	1.19	5.85	Jun	1.19	Dec
1605134001	960 E 100 S # COM	547.00	1.62	2.62	4.02	5.41	6.59	7.43	7.34	6.53	5.25	3.42	1.91	1.38	7.43	Jun	1.38	Dec
1605135015	970 E 100 S	133.44	1.36	2.26	3.51	4.63	5.54	6.24	6.19	5.58	4.57	3.00	1.62	1.13	6.24	Jun	1.13	Dec
1605135016	120 S 1000 E	110.82	0.99	1.46	2.15	2.93	3.66	4.20	4.13	3.56	2.77	1.86	1.14	0.87	4.20	Jun	0.87	Dec
1605135017	128 S 1000 E	174.53	1.31	2.00	2.95	3.84	4.48	4.97	4.97	4.60	3.86	2.60	1.54	1.13	4.97	Jun	1.13	Dec
1605135018	130 S 1000 E	202.50	1.21	1.85	2.77	3.67	4.44	4.99	4.93	4.39	3.58	2.40	1.41	1.05	4.99	Jun	1.05	Dec
1605135019	150 S 1000 E	407.75	1.45	2.34	3.61	4.83	5.84	6.58	6.53	5.84	4.71	3.08	1.72	1.22	6.58	Jun	1.22	Dec
1605135027	160 S 1000 E	430.35	1.55	2.46	3.77	5.04	6.10	6.88	6.81	6.07	4.90	3.22	1.82	1.32	6.88	Jun	1.32	Dec
1605135028	170 S 1000 E	505.19	1.50	2.48	3.85	5.18	6.31	7.14	7.07	6.26	5.00	3.26	1.79	1.25	7.14	Jun	1.25	Dec
1605138001	908 E SOUTHTEMPLE ST	560.62	1.42	2.28	3.49	4.70	5.75	6.50	6.42	5.68	4.54	2.98	1.67	1.21	6.50	Jun	1.21	Dec
1605141001	926 E SOUTHTEMPLE ST	265.16	1.05	1.85	2.87	3.82	4.67	5.28	5.23	4.62	3.70	2.46	1.28	0.85	5.28	Jun	0.85	Dec
1605142001	42 S 1000 E	310.12	1.43	2.15	3.01	3.84	4.56	5.09	5.05	4.57	3.84	2.76	1.68	1.24	5.09	Jun	1.24	Dec

Roof ID	Location	Area meter²	Jan kWh/m²	Feb kWh/m²	Mar kWh/m²	Apr kWh/m²	May kWh/m²	Jun kWh/m²	Jul kWh/m²	Aug kWh/m²	Sep kWh/m²	Oct kWh/m²	Nov kWh/m²	Dec kWh/m²	Max kWh/m²	Max Month	Min Month	Min Month
1605276001	205 S ELIZABETH ST	158.05	1.28	2.03	3.11	4.12	4.97	5.60	5.54	4.94	4.03	2.66	1.51	1.10	5.60	Jun	1.10	Dec
1605276002	209 S ELIZABETH ST	136.96	0.95	1.74	2.83	3.82	4.71	5.36	5.30	4.63	3.68	2.33	1.16	0.77	5.36	Jun	0.77	Dec
1605276003	219 S ELIZABETH ST	242.72	1.03	1.78	2.90	4.13	5.16	5.87	5.79	5.04	3.85	2.35	1.23	0.86	5.87	Jun	0.86	Dec
1605276004	235 S ELIZABETH ST	167.94	0.94	1.67	2.79	4.00	5.06	5.80	5.69	4.88	3.69	2.21	1.13	0.77	5.80	Jun	0.77	Dec
1605276005	239 S ELIZABETH ST	244.53	1.37	2.23	3.45	4.66	5.71	6.47	6.40	5.65	4.49	2.92	1.63	1.16	6.47	Jun	1.16	Dec
1605276006	243 S ELIZABETH ST	227.44	0.93	1.71	2.95	4.16	5.15	5.87	5.80	5.09	3.94	2.33	1.13	0.76	5.87	Jun	0.76	Dec
1605276007	263 S ELIZABETH ST	138.12	1.24	1.91	2.85	3.81	4.68	5.28	5.22	4.60	3.67	2.45	1.45	1.07	5.28	Jun	1.07	Dec
1605276009	1152 E 200 S	172.46	1.15	1.89	2.97	4.07	5.01	5.67	5.60	4.93	3.89	2.47	1.36	0.96	5.67	Jun	0.96	Dec
1605276011	206 S 1200 E	222.70	1.07	2.13	3.64	4.89	5.87	6.60	6.55	5.90	4.79	2.93	1.34	0.83	6.60	Jun	0.83	Dec
1605276012	214 S 1200 E	196.25	1.17	1.83	2.72	3.59	4.34	4.87	4.82	4.29	3.50	2.37	1.37	1.01	4.87	Jun	1.01	Dec
1605276013	222 S 1200 E	186.08	1.42	2.18	3.21	4.24	5.10	5.69	5.65	5.09	4.15	2.82	1.66	1.22	5.69	Jun	1.22	Dec
1605276014	226 S 1200 E	221.64	1.29	2.05	3.07	4.05	4.91	5.49	5.45	4.88	3.97	2.67	1.52	1.10	5.49	Jun	1.10	Dec
1605276015	228-230 S 1200 E	199.98	1.34	2.12	3.18	4.19	5.06	5.69	5.62	5.01	4.11	2.76	1.58	1.14	5.69	Jun	1.14	Dec
1605276016	238 S 1200 E	283.72	1.53	2.46	3.73	4.88	5.86	6.56	6.52	5.88	4.84	3.24	1.81	1.30	6.56	Jun	1.30	Dec
1605276017	242 S 1200 E	290.18	1.08	1.93	3.17	4.46	5.50	6.22	6.15	5.45	4.20	2.57	1.32	0.87	6.22	Jun	0.87	Dec
1605276018	250 S 1200 E	158.44	0.82	1.48	2.54	3.69	4.69	5.37	5.27	4.50	3.35	1.96	0.98	0.67	5.37	Jun	0.67	Dec
1605276019	256 S 1200 E	118.35	0.88	1.61	2.76	3.78	4.50	5.06	5.05	4.61	3.72	2.21	1.07	0.72	5.06	Jun	0.72	Dec
1605276020	270 S 1200 E	235.53	0.69	1.15	1.96	3.01	3.93	4.58	4.48	3.75	2.66	1.51	0.81	0.59	4.58	Jun	0.59	Dec
1605276021	274 S 1200 E	396.94	1.16	1.89	2.92	3.92	4.77	5.38	5.34	4.76	3.82	2.49	1.38	0.99	5.38	Jun	0.99	Dec
1605276024_a	1155 E 300 S	141.62	0.48	0.79	1.86	3.57	4.90	5.71	5.61	4.64	2.75	1.04	0.53	0.42	5.71	Jun	0.42	Dec
1605276024	1155 E 300 S	717.18	1.29	2.12	3.34	4.58	5.62	6.37	6.29	5.53	4.36	2.77	1.53	1.09	6.37	Jun	1.09	Dec
1605277001	1212 E 200 S	230.59	0.98	1.66	2.81	4.08	5.15	5.87	5.80	5.02	3.75	2.20	1.15	0.84	5.87	Jun	0.84	Dec
1605277002	217 S 1200 E	238.39	1.15	1.90	2.96	4.02	4.90	5.52	5.46	4.84	3.84	2.49	1.36	0.97	5.52	Jun	0.97	Dec
1605277003	221 S 1200 E	145.19	1.23	1.91	2.84	3.65	4.30	4.79	4.76	4.35	3.67	2.50	1.45	1.05	4.79	Jun	1.05	Dec
1605277004	225 S 1200 E	163.54	1.14	1.78	2.78	3.81	4.60	5.15	5.11	4.57	3.64	2.32	1.33	0.98	5.15	Jun	0.98	Dec
1605277005	229 S 1200 E	180.92	1.04	1.58	2.32	3.11	3.83	4.32	4.25	3.70	2.95	2.01	1.21	0.91	4.32	Jun	0.91	Dec
1605277006	235 S 1200 E	149.12	0.92	1.64	2.77	3.96	4.95	5.65	5.58	4.86	3.70	2.19	1.11	0.76	5.65	Jun	0.76	Dec
1605277007	241 S 1200 E	161.80	1.48	2.22	3.21	4.14	4.95	5.52	5.47	4.94	4.12	2.86	1.73	1.29	5.52	Jun	1.29	Dec

Roof ID	Location	Area meter²	Jan kWh/m²	Feb kWh/m²	Mar kWh/m²	Apr kWh/m²	May kWh/m²	Jun kWh/m²	Jul kWh/m²	Aug kWh/m²	Sep kWh/m²	Oct kWh/m²	Nov kWh/m²	Dec kWh/m²	Max kWh/m²	Max Month	Min kWh/m²	Min Month
1605277008	245 S 1200 E	212.83	0.90	1.51	2.54	3.75	4.78	5.49	5.40	4.63	3.41	1.98	1.06	0.77	5.49	Jun	0.77	Dec
1605277009	253 S 1200 E	251.89	1.19	1.92	3.00	3.99	4.76	5.34	5.32	4.81	3.94	2.54	1.41	1.01	5.34	Jun	1.01	Dec
1605277010	259 S 1200 E	196.26	1.34	2.15	3.28	4.36	5.24	5.89	5.84	5.24	4.26	2.81	1.59	1.14	5.89	Jun	1.14	Dec
1605277011	263 S 1200 E	145.12	0.98	1.50	2.29	3.20	4.02	4.61	4.52	3.89	2.97	1.92	1.13	0.85	4.61	Jun	0.85	Dec
1605277012	206 S DOUGLAS ST	158.61	1.44	2.31	3.48	4.48	5.29	5.89	5.86	5.36	4.51	3.05	1.70	1.22	5.89	Jun	1.22	Dec
1605277013_a	208 S DOUGLAS ST	103.67	0.73	1.19	1.89	2.78	3.59	4.15	4.06	3.41	2.50	1.53	0.86	0.62	4.15	Jun	0.62	Dec
1605277013	208 S DOUGLAS ST	214.62	1.26	1.90	2.74	3.62	4.52	5.16	5.07	4.35	3.47	2.42	1.46	1.09	5.16	Jun	1.09	Dec
1605277014	216 S DOUGLAS ST	179.28	1.28	2.04	3.10	4.09	4.90	5.47	5.44	4.90	4.02	2.68	1.51	1.09	5.47	Jun	1.09	Dec
1605277015	220 S DOUGLAS ST	192.36	1.34	2.18	3.41	4.59	5.51	6.19	6.15	5.55	4.48	2.87	1.59	1.13	6.19	Jun	1.13	Dec
1605277016	228 S DOUGLAS ST	243.40	1.19	1.93	3.02	4.10	5.01	5.67	5.60	4.93	3.93	2.52	1.40	1.01	5.67	Jun	1.01	Dec
1605277017	234 S DOUGLAS ST	135.13	1.40	2.18	3.20	4.00	4.63	5.13	5.12	4.74	4.10	2.85	1.65	1.19	5.13	Jun	1.19	Dec
1605277018	238 S DOUGLAS ST	224.67	1.34	2.13	3.17	4.12	4.93	5.54	5.48	4.91	4.07	2.79	1.58	1.15	5.54	Jun	1.15	Dec
1605277019	244 S DOUGLAS ST	210.56	1.06	1.79	2.98	4.24	5.18	5.84	5.79	5.17	4.00	2.37	1.26	0.89	5.84	Jun	0.89	Dec
1605277020	252 S DOUGLAS ST	145.80	1.58	2.49	3.60	4.53	5.32	5.93	5.89	5.36	4.58	3.23	1.88	1.36	5.93	Jun	1.36	Dec
1605277021	258 S DOUGLAS ST	159.39	0.96	1.48	2.21	3.19	4.10	4.72	4.61	3.88	2.87	1.86	1.11	0.82	4.72	Jun	0.82	Dec
1605277022	266 S DOUGLAS ST	140.64	1.29	2.05	3.12	3.98	4.60	5.08	5.09	4.74	4.06	2.72	1.53	1.11	5.09	Jul	1.11	Dec
1605277023	1205 E 300 S	241.42	1.30	2.06	3.08	4.11	5.03	5.67	5.60	4.96	3.99	2.67	1.53	1.10	5.67	Jun	1.10	Dec
1605277024	1215 E 300 S	202.49	1.31	2.09	3.13	4.18	5.10	5.76	5.68	5.01	4.04	2.70	1.54	1.13	5.76	Jun	1.13	Dec
1605277025	1223 E 300 S	140.23	1.37	2.08	3.10	4.14	5.04	5.68	5.60	4.95	4.00	2.68	1.59	1.20	5.68	Jun	1.20	Dec
1605277026	1227 E 300 S	147.10	1.14	1.76	2.73	3.82	4.80	5.48	5.39	4.65	3.55	2.27	1.32	0.99	5.48	Jun	0.99	Dec
1605277027	1231 E 300 S	145.35	1.13	1.79	2.81	3.94	4.93	5.62	5.52	4.79	3.68	2.32	1.32	0.97	5.62	Jun	0.97	Dec
1605278001	1246 E 200 S	199.26	1.24	1.94	2.91	3.83	4.70	5.31	5.23	4.56	3.72	2.51	1.45	1.07	5.31	Jun	1.07	Dec
1605278001_a	1246 E 200 S	113.51	1.37	2.22	3.35	4.46	5.41	6.09	6.04	5.39	4.34	2.90	1.63	1.16	6.09	Jun	1.16	Dec
1605278002	209 S DOUGLAS ST	154.51	1.63	2.53	3.74	5.00	6.08	6.85	6.78	6.02	4.83	3.25	1.91	1.40	6.85	Jun	1.40	Dec
1605278003	215 S DOUGLAS ST	185.68	1.54	2.41	3.56	4.57	5.44	6.06	6.02	5.45	4.57	3.14	1.81	1.32	6.06	Jun	1.32	Dec
1605278004	219 S DOUGLAS ST	204.66	1.38	2.19	3.31	4.35	5.13	5.71	5.69	5.21	4.32	2.88	1.63	1.17	5.71	Jun	1.17	Dec
1605278005	227 S DOUGLAS ST	232.91	1.11	1.88	2.93	4.03	5.04	5.77	5.67	4.89	3.78	2.44	1.33	0.93	5.77	Jun	0.93	Dec
1605278006	233 S DOUGLAS ST	132.12	0.82	1.40	2.42	3.73	4.72	5.38	5.32	4.61	3.31	1.82	0.96	0.69	5.38	Jun	0.69	Dec

Roof ID	Location	Area meter²	Jan kWh/m²	Feb kWh/m²	Mar kWh/m²	Apr kWh/m²	May kWh/m²	Jun kWh/m²	Jul kWh/m²	Aug kWh/m²	Sep kWh/m²	Oct kWh/m²	Nov kWh/m²	Dec kWh/m²	Max kWh/m²	Max Month	Min kWh/m²	Min Month
1605278007	239 S DOUGLAS ST	221.50	0.69	1.18	2.01	2.96	3.76	4.29	4.22	3.62	2.68	1.55	0.81	0.58	4.29	Jun	0.58	Dec
1605278008	241 S DOUGLAS ST	124.76	1.36	2.25	3.48	4.35	4.98	5.50	5.53	5.22	4.54	3.05	1.64	1.13	5.53	Jul	1.13	Dec
1605278009	249 S DOUGLAS ST	181.31	1.29	2.02	3.07	4.13	5.03	5.65	5.59	4.97	3.98	2.62	1.51	1.12	5.65	Jun	1.12	Dec
1605278009_a	249 S DOUGLAS ST	111.38	1.07	1.80	2.92	4.18	5.28	6.03	5.94	5.11	3.85	2.35	1.27	0.90	6.03	Jun	0.90	Dec
1605278010	255 S DOUGLAS ST	173.31	1.26	2.03	3.09	4.07	4.91	5.52	5.48	4.91	4.04	2.66	1.50	1.07	5.52	Jun	1.07	Dec
1605278011	259 S DOUGLAS ST	190.88	1.27	2.09	3.15	4.19	5.06	5.69	5.63	5.03	4.09	2.73	1.52	1.08	5.69	Jun	1.08	Dec
1605278012	275 S DOUGLAS ST	327.75	1.52	2.36	3.53	4.64	5.56	6.23	6.19	5.57	4.57	3.08	1.78	1.31	6.23	Jun	1.31	Dec
1605278013	1259 E 300 S # NFF1	82.20	1.41	2.27	3.50	4.67	5.66	6.38	6.32	5.63	4.55	2.97	1.67	1.20	6.38	Jun	1.20	Dec
1605278014	1264 E 200 S	129.67	1.19	2.04	3.19	4.32	5.26	5.93	5.87	5.22	4.17	2.69	1.43	0.98	5.93	Jun	0.98	Dec
1605278015	1268 E 200 S	390.54	1.49	2.40	3.63	4.83	5.85	6.58	6.51	5.81	4.71	3.13	1.76	1.26	6.58	Jun	1.26	Dec
1605278016_a	208-212 S 1300 E	104.09	1.60	2.48	3.66	4.73	5.62	6.27	6.22	5.64	4.72	3.23	1.88	1.37	6.27	Jun	1.37	Dec
1605278016	208-212 S 1300 E	183.07	1.06	1.78	2.85	3.81	4.51	5.03	5.03	4.61	3.76	2.39	1.27	0.89	5.03	Jun	0.89	Dec
1605278017	216 S 1300 E	183.44	1.73	2.59	3.61	4.38	4.97	5.43	5.46	5.18	4.61	3.37	2.03	1.50	5.46	Jul	1.50	Dec
1605278018	222 S 1300 E	348.83	1.41	2.32	3.71	5.10	6.23	7.02	6.95	6.17	4.89	3.07	1.66	1.19	7.02	Jun	1.19	Dec
1605278019	224 S 1300 E	326.65	1.23	1.99	3.07	4.11	5.00	5.63	5.57	4.94	3.99	2.61	1.45	1.05	5.63	Jun	1.05	Dec
1605278020	226 S 1300 E	283.16	1.31	2.20	3.50	4.72	5.70	6.45	6.39	5.71	4.59	2.92	1.57	1.10	6.45	Jun	1.10	Dec
1605278021	238 S 1300 E	408.08	1.58	2.46	3.64	4.73	5.66	6.34	6.29	5.65	4.68	3.19	1.86	1.36	6.34	Jun	1.36	Dec
1605278023	252 S 1300 E	210.48	1.34	2.19	3.31	4.36	5.23	5.86	5.81	5.22	4.28	2.86	1.59	1.11	5.86	Jun	1.11	Dec
1605278024	258 S 1300 E	358.21	1.65	2.36	3.20	4.21	5.09	5.67	5.60	5.00	4.06	2.95	1.90	1.46	5.67	Jun	1.46	Dec
1605278027	1259 E 300 S	210.35	1.18	1.96	3.12	4.32	5.34	6.06	5.98	5.23	4.09	2.57	1.40	1.00	6.06	Jun	1.00	Dec
1605278029	280 S 1300 E	455.06	1.39	2.28	3.49	4.68	5.69	6.41	6.34	5.65	4.54	2.98	1.65	1.18	6.41	Jun	1.18	Dec
1605279001	1310 E 200 S	419.66	1.75	2.70	3.96	5.13	6.14	6.86	6.80	6.11	5.08	3.51	2.04	1.50	6.86	Jun	1.50	Dec
1605279002	215 S 1300 E	507.73	1.45	2.35	3.62	4.84	5.88	6.64	6.57	5.84	4.71	3.08	1.71	1.23	6.64	Jun	1.23	Dec
1605279003	221 S 1300 E	193.90	0.57	0.93	1.82	3.17	4.43	5.22	5.05	4.00	2.51	1.18	0.64	0.49	5.22	Jun	0.49	Dec
1605279005	235-255 S 1300 E	594.86	1.56	2.44	3.63	4.71	5.61	6.27	6.23	5.65	4.70	3.19	1.84	1.34	6.27	Jun	1.34	Dec
1605279006	273 S 1300 E	323.62	1.35	2.21	3.46	4.68	5.70	6.44	6.38	5.66	4.50	2.91	1.60	1.14	6.44	Jun	1.14	Dec
1605279008_a	227 S 1300 E # 1	263.22	1.35	2.23	3.53	4.81	5.83	6.57	6.51	5.80	4.63	2.94	1.60	1.14	6.57	Jun	1.14	Dec
1605279008	227 S 1300 E # 1	414.24	1.73	2.71	4.00	5.22	6.27	7.03	6.96	6.24	5.15	3.51	2.03	1.48	7.03	Jun	1.48	Dec

Roof ID	Location	Area meter²	Jan kWh/m²	Feb kWh/m²	Mar kWh/m²	Apr kWh/m²	May kWh/m²	Jun kWh/m²	Jul kWh/m²	Aug kWh/m²	Sep kWh/m²	Oct kWh/m²	Nov kWh/m²	Dec kWh/m²	Max kWh/m²	Max	Min Month	Min
1605279009	227-231 S 1300 E	151.37	0.67	1.19	2.19	3.48	4.62	5.40	5.29	4.39	3.01	1.58	0.79	0.56	5.40	Jun	0.56	Dec
1605280001	305 S 1200 E	185.54	0.96	1.47	2.16	2.86	3.52	4.00	3.92	3.40	2.74	1.88	1.11	0.83	4.00	Jun	0.83	Dec
1605280001_a	305 S 1200 E	114.73	1.24	1.95	2.88	3.61	4.12	4.55	4.55	4.29	3.73	2.57	1.47	1.05	4.55	Jul	1.05	Dec
1605280002	1224 E 300 S	248.14	0.89	1.45	2.20	3.08	3.98	4.59	4.48	3.74	2.81	1.84	1.05	0.75	4.59	Jun	0.75	Dec
1605280003	1228 E 300 S	158.89	0.58	0.95	1.54	2.52	3.82	4.61	4.39	3.17	1.95	1.13	0.66	0.50	4.61	Jun	0.50	Dec
1605280004	306 S DOUGLAS ST	145.17	1.06	1.70	2.51	3.34	4.11	4.67	4.57	3.97	3.18	2.17	1.25	0.89	4.67	Jun	0.89	Dec
1605280005	315 S 1200 E	347.28	0.92	1.50	2.40	3.43	4.35	5.00	4.92	4.23	3.16	1.96	1.08	0.78	5.00	Jun	0.78	Dec
1605280008	316 S DOUGLAS ST	133.64	1.08	1.75	2.76	3.96	5.02	5.77	5.68	4.88	3.66	2.25	1.27	0.92	5.77	Jun	0.92	Dec
1605281001	1250-1252 E 300 S	229.53	1.34	2.13	3.22	4.29	5.19	5.82	5.77	5.16	4.17	2.77	1.58	1.16	5.82	Jun	1.16	Dec
1605281002	305 S DOUGLAS ST	217.70	1.28	2.06	3.13	4.12	4.91	5.50	5.46	4.92	4.06	2.70	1.51	1.10	5.50	Jun	1.10	Dec
1605281003	315 S DOUGLAS ST	238.97	1.25	1.97	2.98	4.02	5.00	5.72	5.62	4.84	3.82	2.54	1.46	1.07	5.72	Jun	1.07	Dec
1605281004	304 S 1300 E	251.66	1.42	2.28	3.43	4.35	5.03	5.57	5.56	5.17	4.43	3.01	1.68	1.21	5.57	Jun	1.21	Dec
1605281005	310 S 1300 E	215.98	1.08	1.75	2.82	3.94	4.99	5.72	5.62	4.80	3.67	2.29	1.26	0.92	5.72	Jun	0.92	Dec
1605281006	316 S 1300 E	206.88	1.48	2.33	3.49	4.46	5.23	5.82	5.80	5.33	4.50	3.07	1.74	1.27	5.82	Jun	1.27	Dec
1605282002	1314 E 300 S	151.17	1.48	2.25	3.31	4.32	5.19	5.83	5.77	5.17	4.26	2.91	1.72	1.28	5.83	Jun	1.28	Dec
1605282003	309-311 S 1300 E	139.28	1.07	1.68	2.49	3.38	4.14	4.67	4.60	4.05	3.21	2.15	1.26	0.92	4.67	Jun	0.92	Dec
1605282003_a	309-311 S 1300 E	88.25	0.77	1.44	2.42	3.33	4.13	4.72	4.66	4.06	3.17	1.96	0.94	0.63	4.72	Jun	0.63	Dec
1605282004	315-319 S 1300 E	205.01	1.26	1.86	2.84	3.91	4.76	5.35	5.30	4.72	3.72	2.39	1.45	1.11	5.35	Jun	1.11	Dec
1605282004_a	315-319 S 1300 E	114.70	1.16	2.00	3.21	4.24	4.95	5.49	5.50	5.10	4.25	2.70	1.39	0.96	5.50	Jul	0.96	Dec
1605282005	303-305 S 1300 E	157.32	1.30	1.97	2.88	3.75	4.48	4.99	4.95	4.46	3.69	2.53	1.51	1.12	4.99	Jun	1.12	Dec
1605427001	321 S 1200 E	157.19	1.10	1.77	2.70	3.66	4.44	5.00	4.96	4.43	3.55	2.30	1.30	0.94	5.00	Jun	0.94	Dec
1605427002	327 S 1200 E	145.37	1.14	1.74	2.67	3.71	4.65	5.32	5.23	4.51	3.47	2.24	1.32	0.99	5.32	Jun	0.99	Dec
1605427003	333 S 1200 E	151.68	1.21	1.85	2.73	3.68	4.46	5.02	4.98	4.45	3.54	2.38	1.41	1.05	5.02	Jun	1.05	Dec
1605427004	337 S 1200 E	168.40	1.29	2.07	3.19	4.32	5.29	6.00	5.93	5.23	4.14	2.70	1.52	1.10	6.00	Jun	1.10	Dec
1605427005	343 S 1200 E	258.51	1.25	2.02	3.09	4.10	4.96	5.58	5.53	4.94	4.00	2.65	1.48	1.06	5.58	Jun	1.06	Dec
1605427006	351 S 1200 E	193.22	1.02	1.68	2.69	3.76	4.68	5.34	5.25	4.57	3.52	2.20	1.21	0.86	5.34	Jun	0.86	Dec
1605427007	357 S 1200 E	175.00	0.62	1.17	2.24	3.49	4.53	5.24	5.14	4.33	3.07	1.59	0.74	0.52	5.24	Jun	0.52	Dec
1605427009	322 S DOUGLAS ST	184.05	1.51	2.35	3.57	4.64	5.52	6.17	6.14	5.56	4.62	3.09	1.77	1.30	6.17	Jun	1.30	Dec

Roof ID	Location	Area meter²	Jan kWh/m²	Feb kWh/m²	Mar kWh/m²	Apr kWh/m²	May kWh/m²	Jun kWh/m²	Jul kWh/m²	Aug kWh/m²	Sep kWh/m²	Oct kWh/m²	Nov kWh/m²	Dec kWh/m²	Max kWh/m²	Max	Min Month	Min
1605427010	330 S DOUGLAS ST	249.21	1.38	2.13	3.16	4.25	5.24	5.96	5.89	5.15	4.07	2.74	1.62	1.19	5.96	Jun	1.19	Dec
1605427011	334 S DOUGLAS ST	198.11	1.37	2.09	3.15	4.07	4.81	5.37	5.33	4.83	4.05	2.73	1.59	1.18	5.37	Jun	1.18	Dec
1605427012	336 S DOUGLAS ST	186.12	1.47	2.25	3.28	4.32	5.17	5.78	5.75	5.20	4.25	2.90	1.73	1.24	5.78	Jun	1.24	Dec
1605427013	342 S DOUGLAS ST	185.22	1.31	2.00	3.00	4.02	4.91	5.56	5.48	4.84	3.89	2.58	1.52	1.14	5.56	Jun	1.14	Dec
1605427014	348 S DOUGLAS ST	265.35	1.32	2.07	3.14	4.22	5.16	5.81	5.75	5.08	4.06	2.69	1.55	1.15	5.81	Jun	1.15	Dec
1605427015	358 S DOUGLAS ST	199.28	1.51	2.38	3.59	4.67	5.51	6.13	6.11	5.59	4.67	3.13	1.78	1.28	6.13	Jun	1.28	Dec
1605427015_a	358 S DOUGLAS ST	105.73	1.17	1.94	3.15	4.39	5.34	6.04	6.00	5.35	4.18	2.57	1.38	0.99	6.04	Jun	0.99	Dec
1605427016	364 S DOUGLAS ST	218.76	1.30	2.12	3.25	4.38	5.37	6.10	6.02	5.29	4.22	2.76	1.55	1.10	6.10	Jun	1.10	Dec
1605427017	1203 E 400 S	167.59	1.22	1.89	2.75	3.55	4.20	4.69	4.66	4.23	3.55	2.45	1.44	1.05	4.69	Jun	1.05	Dec
1605427018	1209 E 400 S	162.26	1.49	2.23	3.13	3.88	4.48	4.95	4.95	4.62	4.02	2.90	1.75	1.30	4.95	Jul	1.30	Dec
1605427019	1215 E 400 S	153.51	1.30	2.13	3.31	4.47	5.46	6.20	6.13	5.41	4.33	2.79	1.54	1.11	6.20	Jun	1.11	Dec
1605427020	1219 E 400 S	111.51	1.05	1.78	2.84	3.94	4.87	5.55	5.47	4.78	3.74	2.34	1.26	0.87	5.55	Jun	0.87	Dec
1605427021	1225 E 400 S	122.95	1.02	1.65	2.64	3.68	4.56	5.19	5.11	4.45	3.46	2.15	1.19	0.86	5.19	Jun	0.86	Dec
1605427022	1231 E 400 S	110.20	1.07	1.69	2.60	3.62	4.46	5.07	5.02	4.42	3.44	2.20	1.26	0.92	5.07	Jun	0.92	Dec
1605428001	319 S DOUGLAS ST	186.93	1.25	2.15	3.28	4.30	5.13	5.75	5.72	5.18	4.26	2.84	1.51	1.04	5.75	Jun	1.04	Dec
1605428002	327 S DOUGLAS ST	228.20	0.87	1.45	2.45	3.70	4.75	5.46	5.37	4.58	3.28	1.88	1.01	0.75	5.46	Jun	0.75	Dec
1605428003	333 S DOUGLAS ST	157.03	1.17	1.88	2.77	3.57	4.27	4.78	4.73	4.23	3.53	2.43	1.38	0.99	4.78	Jun	0.99	Dec
1605428004	339 S DOUGLAS ST	191.50	1.27	1.96	2.93	3.95	4.82	5.47	5.41	4.79	3.81	2.53	1.48	1.09	5.47	Jun	1.09	Dec
1605428005	345 S DOUGLAS ST	193.03	1.20	1.84	2.82	3.77	4.57	5.15	5.08	4.50	3.64	2.39	1.39	1.04	5.15	Jun	1.04	Dec
1605428006	351 S DOUGLAS ST	203.53	1.05	1.67	2.55	3.55	4.43	5.04	4.96	4.29	3.32	2.14	1.24	0.90	5.04	Jun	0.90	Dec
1605428007_a	355 S DOUGLAS ST	111.24	0.86	1.48	2.48	3.65	4.65	5.35	5.24	4.47	3.31	1.94	1.02	0.72	5.35	Jun	0.72	Dec
1605428007	355 S DOUGLAS ST	220.88	1.07	1.69	2.64	3.62	4.48	5.09	5.03	4.40	3.46	2.21	1.25	0.91	5.09	Jun	0.91	Dec
1605428008	363 S DOUGLAS ST	117.65	1.46	2.23	3.30	4.22	4.93	5.46	5.46	5.04	4.28	2.92	1.71	1.27	5.46	Jun	1.27	Dec
1605428009	371 S DOUGLAS ST	137.14	1.04	1.81	2.99	4.20	5.22	5.97	5.88	5.13	3.95	2.40	1.25	0.86	5.97	Jun	0.86	Dec
1605428010	1253 E 400 S	197.39	1.56	2.40	3.52	4.55	5.38	6.00	5.97	5.44	4.54	3.11	1.83	1.34	6.00	Jun	1.34	Dec
1605428011	322 S 1300 E	193.13	1.51	2.33	3.48	4.59	5.59	6.32	6.24	5.51	4.47	3.02	1.76	1.30	6.32	Jun	1.30	Dec
1605428012	330 S 1300 E	253.63	1.44	2.27	3.43	4.57	5.55	6.24	6.18	5.49	4.44	2.96	1.69	1.23	6.24	Jun	1.23	Dec
1605428013	334 S 1300 E	283.91	1.40	2.20	3.36	4.49	5.43	6.11	6.05	5.39	4.37	2.86	1.64	1.21	6.11	Jun	1.21	Dec

Roof ID	Location	Area meter²	Jan kWh/m²	Feb kWh/m²	Mar kWh/m²	Apr kWh/m²	May kWh/m²	Jun kWh/m²	Jul kWh/m²	Aug kWh/m²	Sep kWh/m²	Oct kWh/m²	Nov kWh/m²	Dec kWh/m²	Max kWh/m²	Max Month	Min kWh/m²	Min Month
1605428014	340 S 1300 E	229.82	1.39	2.29	3.52	4.65	5.58	6.27	6.22	5.57	4.57	3.01	1.66	1.17	6.27	Jun	1.17	Dec
1605428015	344 S 1300 E	139.62	1.47	2.31	3.44	4.48	5.35	5.99	5.94	5.36	4.45	3.01	1.73	1.25	5.99	Jun	1.25	Dec
1605428016	354 S 1300 E	245.25	0.94	1.67	2.84	4.06	5.05	5.76	5.67	4.93	3.77	2.22	1.12	0.78	5.76	Jun	0.78	Dec
1605428017	360 S 1300 E	175.70	1.49	2.30	3.33	4.22	4.91	5.45	5.45	5.04	4.29	3.00	1.76	1.28	5.45	Jul	1.28	Dec
1605428018	364 S 1300 E	225.05	1.47	2.36	3.56	4.64	5.55	6.24	6.19	5.57	4.60	3.10	1.74	1.26	6.24	Jun	1.26	Dec
1605428020	1259 E 400 S	106.37	1.36	2.16	3.30	4.40	5.27	5.92	5.87	5.28	4.30	2.82	1.60	1.17	5.92	Jun	1.17	Dec
1605428021	1263-1265 S 400 E	204.35	1.10	1.85	2.97	4.17	5.19	5.91	5.82	5.07	3.91	2.43	1.31	0.92	5.91	Jun	0.92	Dec
1605428022	1271 E 400 S	186.40	1.21	1.90	2.98	4.08	5.03	5.71	5.63	4.92	3.88	2.47	1.41	1.04	5.71	Jun	1.04	Dec
1605428023	378 S 1300 E	267.55	0.98	1.70	2.77	3.83	4.72	5.34	5.28	4.65	3.64	2.26	1.17	0.81	5.34	Jun	0.81	Dec
1605428024	1255-1261 E 400 S	138.54	1.55	2.42	3.68	4.87	5.82	6.52	6.48	5.85	4.80	3.17	1.81	1.34	6.52	Jun	1.34	Dec
1605428025	1255-1261 E 400 S	133.88	1.04	1.82	3.01	4.24	5.23	5.93	5.87	5.18	4.00	2.44	1.25	0.87	5.93	Jun	0.87	Dec
1605429001	327 S 1300 E	146.18	1.11	1.82	2.85	3.78	4.55	5.12	5.07	4.54	3.70	2.41	1.31	0.95	5.12	Jun	0.95	Dec
1605429001_a	327 S 1300 E	125.90	1.13	1.91	3.01	3.93	4.58	5.08	5.09	4.74	3.96	2.58	1.36	0.94	5.09	Jul	0.94	Dec
1605429002	333 S 1300 E	121.42	0.71	1.14	1.83	2.79	3.85	4.59	4.42	3.45	2.38	1.41	0.83	0.60	4.59	Jun	0.60	Dec
1605429003	339 S 1300 E	132.61	0.73	1.23	2.05	3.16	4.12	4.76	4.67	3.94	2.78	1.60	0.86	0.62	4.76	Jun	0.62	Dec
1605429004	343 S 1300 E	104.49	1.58	2.27	3.23	4.25	5.10	5.70	5.63	5.04	4.15	2.87	1.81	1.39	5.70	Jun	1.39	Dec
1605429006	355 S 1300 E	167.52	1.45	2.25	3.33	4.30	5.09	5.68	5.65	5.13	4.29	2.92	1.70	1.24	5.68	Jun	1.24	Dec
1605429007	357 S 1300 E	116.32	1.28	1.95	2.84	3.76	4.57	5.15	5.09	4.49	3.65	2.49	1.49	1.11	5.15	Jun	1.11	Dec
1605429008	361 S 1300 E	235.94	1.34	2.14	3.25	4.23	5.05	5.66	5.63	5.09	4.21	2.82	1.59	1.14	5.66	Jun	1.14	Dec
1605429009	367-369 S 1300 E	147.06	1.34	2.03	2.95	3.85	4.61	5.16	5.11	4.58	3.78	2.60	1.56	1.17	5.16	Jun	1.17	Dec
1605429011	1303 E 400 S	190.04	1.32	2.14	3.28	4.36	5.23	5.86	5.82	5.25	4.29	2.81	1.57	1.11	5.86	Jun	1.11	Dec
1605429012	1309 E 400 S	179.59	1.23	2.03	3.16	4.30	5.28	5.97	5.91	5.21	4.11	2.66	1.46	1.03	5.97	Jun	1.03	Dec
1605429013	1311 E 400 S	132.92	1.05	1.74	2.74	3.78	4.71	5.37	5.28	4.59	3.58	2.27	1.25	0.89	5.37	Jun	0.89	Dec
1605429014	351 S 1300 E	150.10	1.25	1.97	3.08	4.20	5.09	5.74	5.69	5.07	4.05	2.58	1.47	1.08	5.74	Jun	1.08	Dec

APPENDIX C

Estimated Total Number of Panels per Rooftop

and Estimated Energy per Rooftop

Table 1. Scenario 1 and 2 estimated maximum number of PV panels and kWh based on an average solar insolation input of 5.695 kWh/m² and 4.08 kWh/m² for scenario 1 and scenario 2 respectively. Roof IDs followed by "_a" identify a secondary building within a parcel. Scenario 1 results apply from May to September. Scenario 2 results includes all months.

Roof ID	Site Address	Parcel Land Use	Roof Area meters²	Scenario 1 # of panels	Scenario 1 kWh/Day	Scenario 1 kWh	Scenario 1 % usable roof	Scenario 2 # of panels	Scenario 2 kWh/Day	Scenario 2 kWh	Scenario 2 % usable roof
1604151001	1318 E 200 S	UNKNOWN	143.6835	24	17.19	2630.42	15.69	19	9.47	3456.55	12.42
1604151004	206 S UNIVERSITY ST	RETAIL STORE	650.5026	340	269.33	41207.96	49.10	331	177.61	64827.65	47.80
1604151005	220 S UNIVERSITY ST	DUPLEX	147.1055	0	0.00	0.00	0.00	0	0	0.00	0.00
1604151006	222 S UNIVERSITY ST	SINGLE FAMILY RESIDE	128.6451	14	9.96	1523.30	10.22	3	1.44	525.60	2.19
1604151007	232 S UNIVERSITY ST	CHURCH OR PUBLIC	243.6718	37	26.92	4118.64	14.26	26	13.34	4869.10	10.02
1604151008	240 S UNIVERSITY ST	SINGLE FAMILY RESIDE	110.8073	17	12.38	1894.14	14.41	15	7.55	2755.75	12.72
1604151011	252 S UNIVERSITY ST	SINGLE FAMILY RESIDE	209.2991	43	34.47	5274.64	19.30	42	24.43	8916.95	18.85
1604151014	264 S UNIVERSITY ST	SINGLE FAMILY RESIDE	336.1979	114	88.02	13467.26	31.85	85	49.04	17899.60	23.75
1604151015	274 S UNIVERSITY ST	CHURCH	1414.894	722	547.46	83761.46	47.93	420	233.6	85264.00	27.88
1604151016	248 S UNIVERSITY ST	SINGLE FAMILY RESIDE	224.6386	54	43.22	6612.80	22.58	54	30.22	11030.30	22.58
1604151017	258 S UNIVERSITY ST	SINGLE FAMILY RESIDE	225.1857	55	42.66	6527.04	22.94	50	28.79	10508.35	20.86
1604151018	1320 E 200 S # C	RETAIL STORE	473.3033	228	178.53	27314.60	45.25	216	115.23	42058.95	42.87
1604152001	1318 E 300 S	SINGLE FAMILY RESIDE	154.8868	22	16.78	2566.85	13.34	24	13.24	4832.60	14.56
1604152002	1330 E 300 S	SINGLE FAMILY RESIDE	157.3332	22	15.31	2342.30	13.14	7	3.45	1259.25	4.18
1604152003	1336-1338 E 300 S	DUPLEX	191.7078	60	46.03	7043.17	29.40	55	28.57	10428.05	26.95
1604152004	1342 E 300 S	SINGLE FAMILY RESIDE	169.1146	13	9.38	1434.66	7.22	5	2.61	952.65	2.78
1604152005	316 S UNIVERSITY ST	MULTIPLE RESIDENTIAL	115.5853	43	33.68	5153.48	34.95	42	22.58	8241.70	34.13
1604152006	316 S UNIVERSITY ST	SINGLE FAMILY RESIDE	152.3837	11	8.05	1231.68	6.78	8	4.2	1533.00	4.93
1604301007	322 S UNIVERSITY ST	FRATERNITY/SORORITY	147.2541	81	62.19	9515.54	51.67	77	40.49	14778.85	49.12
1604301008	328 S UNIVERSITY ST	SINGLE FAMILY RESIDE	88.20264	0	0.00	0.00	0.00	0	0	0.00	0.00
1604301009	332 S UNIVERSITY ST	SINGLE FAMILY RESIDE	167.6276	17	12.42	1900.69	9.53	8	4.34	1584.10	4.48
1604301010	340 S UNIVERSITY ST	DUPLEX	116.4484	0	0.00	0.00	0.00	0	0	0.00	0.00
1604301011	346 S UNIVERSITY ST	SINGLE FAMILY RESIDE	196.9054	34	26.01	3979.50	16.22	33	18.58	6781.70	15.74

Roof ID	Site Address	Parcel Land Use	Roof Area meters²	Scenario 1 # of panels	Scenario 1 kWh/Day	Scenario 1 kWh	Scenario 1 % usable roof	Scenario 2 # of panels	Scenario 2 kWh/Day	Scenario 2 kWh	Scenario 2 % usable roof
1604301013	356 S UNIVERSITY ST	3-4 UNIT APARTMENT	182.4639	27	21.50	3288.79	13.90	30	17.43	6361.95	15.44
1604301014	362 S UNIVERSITY ST	SINGLE FAMILY RESIDE	134.4994	18	13.71	2098.12	12.57	14	8.15	2974.75	9.78
1604301015	368 S UNIVERSITY ST	SINGLE FAMILY RESIDE	118.7013	52	39.93	6109.53	41.15	47	24.19	8829.35	37.19
1604301016	1319 E 400 S	SINGLE FAMILY RESIDE	95.55621	4	2.92	447.40	3.93	2	1.08	394.20	1.97
1604301017	1321 E 400 S	SINGLE FAMILY RESIDE	72.23743	4	2.76	421.54	5.20	0	0	0.00	0.00
1604301018	1327 E 400 S	SINGLE FAMILY RESIDE	117.6507	8	5.71	873.87	6.39	3	1.5	547.50	2.40
1604301019	1333 E 400 S	SINGLE FAMILY RESIDE	108.7107	38	28.22	4317.84	32.84	34	17.08	6234.20	29.38
1604301020	1337 E 400 S	SINGLE FAMILY RESIDE	113.0673	4	2.79	426.81	3.32	3	1.59	580.35	2.49
1604301026	348 S UNIVERSITY ST	SINGLE FAMILY RESIDE	171.6395	30	23.56	3604.52	16.42	31	17.27	6303.55	16.97
1604301027	352 S UNIVERSITY ST	SINGLE FAMILY RESIDE	171.2277	21	15.50	2371.90	11.52	13	7.1	2591.50	7.13
1605127005	35 S 900 E	NURSING HOSPITAL	1386.328	371	274.07	41933.44	25.14	231	118.13	43117.45	15.65
1605127007	41 S 900 E	NURSING HOSPITAL	834.2706	204	159.36	24381.99	22.97	176	97.79	35693.35	19.82
1605127009	59 S 900 E	MULTIPLE RESIDENTIAL	146.4693	30	22.21	3398.79	19.24	20	10.4	3796.00	12.83
1605127010	63 S 900 E	RESIDENCE IMPS ON CO	126.3632	10	6.76	1034.99	7.43	0	0	0.00	0.00
1605127017	12 S HAXTON PL	SINGLE FAMILY RESIDE	142.4884	0	0.00	0.00	0.00	0	0	0.00	0.00
1605127018	16 S HAXTON PL	SINGLE FAMILY RESIDE	142.8303	32	22.67	3469.11	21.05	21	10.88	3971.20	13.81
1605127019	22 S HAXTON PL	SINGLE FAMILY RESIDE	118.4881	35	26.31	4025.84	27.75	29	16.17	5902.05	22.99
1605127020	32 S HAXTON PL	SINGLE FAMILY RESIDE	134.79	26	19.69	3012.08	18.12	24	12.9	4708.50	16.73
1605127021	35 S HAXTON PL	SINGLE FAMILY RESIDE	194.0873	18	13.29	2034.08	8.71	17	9.43	3441.95	8.23
1605127027	927 E 100 S	SINGLE FAMILY RESIDE	181.3241	10	6.91	1057.89	5.18	0	0	0.00	0.00
1605127027_a	945 E 100 S	SINGLE FAMILY RESIDE	98.42355	24	16.97	2597.06	22.91	6	2.98	1087.70	5.73
1605127028_a	945 E 100 S	SINGLE FAMILY RESIDE	104.6624	23	16.45	2516.38	20.64	12	5.97	2179.05	10.77
1605127028	945 E 100 S	SINGLE FAMILY RESIDE	211.1706	6	4.39	672.42	2.67	4	2.05	748.25	1.78
1605127029	919 E 100 S	UNKNOWN	147.494	2	1.43	218.40	1.27	1	0.5	182.50	0.64
1605127030	921 E 100 S	SINGLE FAMILY RESIDE	115.0753	0	0.00	0.00	0.00	0	0	0.00	0.00
1605127033	75 S 900 E	CONVENIENCE STORE	197.2808	31	22.62	3461.14	14.76	27	13.63	4974.95	12.86
1605128001	3-5 S HAXTON PL	DUPLEX	194.9314	61	42.81	6549.85	29.40	13	6.6	2409.00	6.26
1605128002	19 S HAXTON PL	SINGLE FAMILY RESIDE	234.0765	6	4.15	635.37	2.41	0	0	0.00	0.00

Roof ID	Site Address	Parcel Land Use	Roof Area meters²	Scenario 1 # of panels	Scenario 1 kWh/Day	Scenario 1 kWh	Scenario 1 % usable roof	Scenario 2 # of panels	Scenario 2 kWh/Day	Scenario 2 kWh	Scenario 2 % usable roof
1605128002_a	19 S HAXTON PL	SINGLE FAMILY RESIDE	102.298	11	7.81	1195.18	10.10	2	1.01	368.65	1.84
1605128003	31 S HAXTON PL	SINGLE FAMILY RESIDE	171.4013	41	30.01	4591.33	22.47	19	10.74	3920.10	10.41
1605128004	35 S HAXTON PL	SINGLE FAMILY RESIDE	196.8178	15	11.01	1685.23	7.16	15	8.32	3036.80	7.16
1605128006	951 E 100 S	CHURCH	1986.431	917	721.95	110458.63	43.36	877	469.05	171203.25	41.47
1605128007	966 E SOUTHTEMPLE ST	SINGLE FAMILY RESIDE	230.4637	14	9.95	1522.92	5.71	15	7.66	2795.90	6.11
1605128008	974 E SOUTHTEMPLE ST	OTHER EXEMPT	219.3675	45	34.25	5239.88	19.27	42	23.41	8544.65	17.98
1605128008_a	974 E SOUTHTEMPLE ST	OTHER EXEMPT	212.9275	47	36.86	5639.15	20.73	45	23.95	8741.75	19.85
1605128009_a	24-26 S 1000 E	MULTIPLE RESIDENTIAL	129.9428	8	5.80	887.42	5.78	2	0.97	354.05	1.45
1605128009	24-26 S 1000 E	MULTIPLE RESIDENTIAL	193.265	42	32.01	4896.85	20.41	33	18.52	6759.80	16.04
1605128010	30 S 1000 E	SINGLE FAMILY RESIDE	159.0512	13	9.23	1411.84	7.68	8	3.91	1427.15	4.72
1605128011	34 S 1000 E	SINGLE FAMILY RESIDE	216.1243	36	27.72	4241.24	15.65	30	16.15	5894.75	13.04
1605128012	38 S 1000 E	SINGLE FAMILY RESIDE	133.1614	23	17.77	2718.47	16.22	21	11.88	4336.20	14.81
1605128014	50-52 S 1000 E	SINGLE FAMILY RESIDE	99.02797	2	1.36	207.90	1.90	1	0.5	182.50	0.95
1605128015	58 S 1000 E	10-19 UNIT APARTMENT	368.5505	159	122.57	18753.20	40.53	131	67.21	24531.65	33.39
1605128015_a	58 S 1000 E	10-19 UNIT APARTMENT	124.2836	0	0.00	0.00	0.00	0	0	0.00	0.00
1605128016	64 S 1000 E	UNKNOWN	129.5328	18	13.48	2062.83	13.05	19	10.83	3952.95	13.78
1605128017	955 E 100 S	5-9 UNIT APARTMENT	171.4358	15	10.72	1640.91	8.22	4	2.11	770.15	2.19
1605128019	975 E 100 S	OFFICE CONVERSION	213.9287	36	27.35	4184.79	15.81	32	17.5	6387.50	14.05
1605134001	960 E 100 S # COM	CONDOMINIUM TIMESHAR	546.9962	397	320.83	49086.77	68.18	368	203	74095.00	63.20
1605135015	970 E 100 S	SINGLE FAMILY RESIDE	133.4405	32	22.89	3502.27	22.53	12	6.21	2266.65	8.45
1605135016	120 S 1000 E	SINGLE FAMILY RESIDE	110.8156	2	1.39	213.42	1.70	6	3.01	1098.65	5.09
1605135017	128 S 1000 E	APARTMENT CONVERSION	174.5269	14	10.39	1590.17	7.54	13	7.18	2620.70	7.00
1605135018	130 S 1000 E	UNKNOWN	202.4962	29	22.40	3427.82	13.45	27	15.57	5683.05	12.52
1605135019	150 S 1000 E	MEDICAL OFFICE	407.7488	160	125.93	19267.55	36.86	143	76.29	27845.85	32.94
1605135027	160 S 1000 E	MEDICAL OFFICE	430.3495	150	117.82	18026.57	32.74	139	73.95	26991.75	30.34
1605135028	170 S 1000 E	OFFICE	505.195	367	285.77	43722.68	68.24	358	187.19	68324.35	66.57
1605138001	908 E SOUTHTEMPLE ST	CONDOMINIUM TIMESHAR	560.6207	207	158.35	24228.11	34.68	176	91.68	33463.20	29.49

Roof ID	Site Address	Parcel Land Use	Roof Area meters²	Scenario 1 # of panels	Scenario 1 kWh/Day	Scenario 1 kWh	Scenario 1 % usable roof	Scenario 2 # of panels	Scenario 2 kWh/Day	Scenario 2 kWh	Scenario 2 % usable roof
1605141001	926 E SOUTHTEMPLE ST	CONDOMINIUM UNIT	265.1553	74	52.46	8025.87	26.22	73	38.07	13895.55	25.86
1605142001	42 S 1000 E	CONDOMINIUM UNIT	310.1218	30	21.62	3307.33	9.09	28	15.74	5745.10	8.48
1605276001	205 S ELIZABETH ST	DUPLEX	158.048	45	33.54	5131.60	26.75	38	19.62	7161.30	22.59
1605276002	209 S ELIZABETH ST	SINGLE FAMILY RESIDE	136.9621	30	22.73	3478.22	20.58	23	12.03	4390.95	15.77
1605276003	219 S ELIZABETH ST	SINGLE FAMILY RESIDE	242.7163	62	47.13	7211.13	24.00	43	22.59	8245.35	16.64
1605276004	235 S ELIZABETH ST	SINGLE FAMILY RESIDE	167.9423	47	35.90	5493.25	26.29	37	18.84	6876.60	20.70
1605276005	239 S ELIZABETH ST	3-4 UNIT APARTMENT	244.5272	86	66.82	10222.90	33.04	80	41.95	15311.75	30.73
1605276006	243 S ELIZABETH ST	SINGLE FAMILY RESIDE	227.4428	72	52.09	7969.70	29.74	37	18.7	6825.50	15.28
1605276007	263 S ELIZABETH ST	SINGLE FAMILY RESIDE	138.1248	14	10.04	1536.86	9.52	9	4.62	1686.30	6.12
1605276009	1152 E 200 S	SINGLE FAMILY RESIDE	172.4639	25	18.36	2809.21	13.62	18	9.09	3317.85	9.80
1605276011	206 S 1200 E	3-4 UNIT APARTMENT	222.6958	102	77.91	11920.62	43.02	75	40.21	14676.65	31.64
1605276012	214 S 1200 E	SINGLE FAMILY RESIDE	196.2476	7	5.02	767.89	3.35	5	2.58	941.70	2.39
1605276013	222 S 1200 E	SINGLE FAMILY RESIDE	186.0761	38	29.53	4517.97	19.18	46	25.93	9464.45	23.22
1605276014	226 S 1200 E	SINGLE FAMILY RESIDE	221.6389	19	14.92	2283.26	8.05	14	8.27	3018.55	5.93
1605276015	228-230 S 1200 E	SINGLE FAMILY RESIDE	199.9769	39	29.92	4577.64	18.32	36	19.47	7106.55	16.91
1605276016	238 S 1200 E	SINGLE FAMILY RESIDE	283.7177	112	86.89	13294.17	37.08	87	49.26	17979.90	28.80
1605276017	242 S 1200 E	SINGLE FAMILY RESIDE	290.1803	100	75.42	11539.38	32.37	60	33.19	12114.35	19.42
1605276018	250 S 1200 E	SINGLE FAMILY RESIDE	158.4388	37	26.49	4052.57	21.94	11	5.5	2007.50	6.52
1605276019	256 S 1200 E	SINGLE FAMILY RESIDE	118.3537	8	5.71	872.90	6.35	5	2.57	938.05	3.97
1605276020	270 S 1200 E	SINGLE FAMILY RESIDE	235.5349	10	7.60	1162.57	3.99	9	4.98	1817.70	3.59
1605276021	274 S 1200 E	SINGLE FAMILY RESIDE	396.9357	34	26.91	4116.50	8.05	34	19.75	7208.75	8.05
1605276024_a	1155 E 300 S	APARTMENT 20-49 UNIT	141.6225	64	46.55	7122.91	42.45	0	0	0.00	0.00
1605276024	1155 E 300 S	APARTMENT 20-49 UNIT	717.1847	365	284.07	43462.60	47.81	329	171.74	62685.10	43.09
1605277001	1212 E 200 S	SINGLE FAMILY RESIDE	230.5922	45	33.60	5141.16	18.33	29	15.59	5690.35	11.81
1605277002	217 S 1200 E	DUPLEX	238.3894	20	14.79	2263.48	7.88	9	5.13	1872.45	3.55
1605277003	221 S 1200 E	SINGLE FAMILY RESIDE	145.1868	20	15.02	2297.50	12.94	24	13.35	4872.75	15.53
1605277004	225 S 1200 E	SINGLE FAMILY RESIDE	163.5374	23	17.15	2624.15	13.21	23	12.33	4500.45	13.21
1605277005	229 S 1200 E	SINGLE FAMILY RESIDE	180.9163	15	11.04	1688.78	7.79	14	7.57	2763.05	7.27

Roof ID	Site Address	Parcel Land Use	Roof Area meters²	Scenario 1 # of panels	Scenario 1 kWh/Day	Scenario 1 kWh	Scenario 1 % usable roof	Scenario 2 # of panels	Scenario 2 kWh/Day	Scenario 2 kWh	Scenario 2 % usable roof
1605277006	235 S 1200 E	SINGLE FAMILY RESIDE	149.1182	18	13.45	2057.29	11.34	14	7.53	2748.45	8.82
1605277007	241 S 1200 E	5-9 UNIT APARTMENT	161.8021	19	14.36	2197.22	11.03	19	10.95	3996.75	11.03
1605277008	245 S 1200 E	SINGLE FAMILY RESIDE	212.8285	29	20.81	3184.08	12.80	8	4.06	1481.90	3.53
1605277009	253 S 1200 E	SINGLE FAMILY RESIDE	251.8917	41	30.98	4739.49	15.29	39	21.71	7924.15	14.54
1605277010	259 S 1200 E	SINGLE FAMILY RESIDE	196.2624	45	35.20	5384.91	21.54	42	22.94	8373.10	20.10
1605277011	263 S 1200 E	SINGLE FAMILY RESIDE	145.1248	18	13.40	2050.26	11.65	17	8.44	3080.60	11.00
1605277012	206 S DOUGLAS ST	SINGLE FAMILY RESIDE	158.6148	30	22.32	3414.47	17.77	28	14.4	5256.00	16.58
1605277013_a	208 S DOUGLAS ST	MULTIPLE RESIDENTIAL	103.6661	7	4.77	729.50	6.34	0	0	0.00	0.00
1605277013	208 S DOUGLAS ST	MULTIPLE RESIDENTIAL	214.6194	20	15.05	2302.32	8.75	21	11.84	4321.60	9.19
1605277014	216 S DOUGLAS ST	SINGLE FAMILY RESIDE	179.2765	34	26.19	4007.66	17.81	34	17.86	6518.90	17.81
1605277015	220 S DOUGLAS ST	SINGLE FAMILY RESIDE	192.3642	49	37.56	5746.00	23.93	42	23.16	8453.40	20.51
1605277016	228 S DOUGLAS ST	DUPLEX	243.4003	42	32.50	4972.74	16.21	36	19.27	7033.55	13.89
1605277017	234 S DOUGLAS ST	SINGLE FAMILY RESIDE	135.1336	11	8.42	1288.31	7.65	15	8.33	3040.45	10.43
1605277018	238 S DOUGLAS ST	SINGLE FAMILY RESIDE	224.6682	35	26.23	4013.40	14.63	32	17.6	6424.00	13.38
1605277019	244 S DOUGLAS ST	SINGLE FAMILY RESIDE	210.561	48	36.70	5614.94	21.41	36	19.89	7259.85	16.06
1605277020	252 S DOUGLAS ST	SINGLE FAMILY RESIDE	145.802	19	14.25	2179.54	12.24	18	10.11	3690.15	11.60
1605277021	258 S DOUGLAS ST	SINGLE FAMILY RESIDE	159.3901	10	7.23	1106.82	5.89	10	5.32	1941.80	5.89
1605277022	266 S DOUGLAS ST	SINGLE FAMILY RESIDE	140.6436	14	10.53	1611.21	9.35	14	7.73	2821.45	9.35
1605277023	1205 E 300 S	SINGLE FAMILY RESIDE	241.421	20	15.44	2363.02	7.78	21	11.32	4131.80	8.17
1605277024	1215 E 300 S	APARTMENT CONVERSION	202.4895	24	17.38	2659.44	11.13	17	8.69	3171.85	7.89
1605277025	1223 E 300 S	SINGLE FAMILY RESIDE	140.2267	17	12.65	1935.86	11.39	15	7.93	2894.45	10.05
1605277026	1227 E 300 S	SINGLE FAMILY RESIDE	147.1	10	7.65	1170.10	6.39	12	6.48	2365.20	7.66
1605277027	1231 E 300 S	3-4 UNIT APARTMENT	145.3516	11	7.88	1205.01	7.11	5	2.58	941.70	3.23
1605278001	1246 E 200 S	SINGLE FAMILY RESIDE	199.2629	25	20.01	3061.69	11.79	25	14.4	5256.00	11.79
1605278001_a	1246 E 200 S	SINGLE FAMILY RESIDE	113.5118	36	26.49	4053.06	29.79	34	16.91	6172.15	28.14
1605278002	209 S DOUGLAS ST	CHURCH OR PUBLIC	154.5081	101	79.97	12236.15	61.40	98	52.62	19206.30	59.58
1605278003	215 S DOUGLAS ST	SINGLE FAMILY RESIDE	185.6789	30	22.84	3494.04	15.18	31	16.88	6161.20	15.68
1605278004	219 S DOUGLAS ST	SINGLE FAMILY RESIDE	204.6562	41	30.82	4716.22	18.82	46	24.58	8971.70	21.11

Roof ID	Site Address	Parcel Land Use	Roof Area meters²	Scenario 1 # of panels	Scenario 1 kWh/Day	Scenario 1 kWh	Scenario 1 % usable roof	Scenario 2 # of panels	Scenario 2 kWh/Day	Scenario 2 kWh	Scenario 2 % usable roof
1605278005	227 S DOUGLAS ST	SINGLE FAMILY RESIDE	232.9136	46	35.18	5383.00	18.55	45	24.54	8957.10	18.15
1605278006	233 S DOUGLAS ST	SINGLE FAMILY RESIDE	132.1226	15	10.94	1673.16	10.66	8	4.11	1500.15	5.69
1605278007	239 S DOUGLAS ST	SINGLE FAMILY RESIDE	221.4976	11	7.64	1168.57	4.67	0	0	0.00	0.00
1605278008	241 S DOUGLAS ST	SINGLE FAMILY RESIDE	124.7618	20	14.97	2290.59	15.06	22	12.02	4387.30	16.56
1605278009	249 S DOUGLAS ST	SINGLE FAMILY RESIDE	181.306	29	21.80	3335.88	15.03	23	12.74	4650.10	11.92
1605278009_a	249 S DOUGLAS ST	SINGLE FAMILY RESIDE	111.3759	8	6.26	957.84	6.75	8	4.07	1485.55	6.75
1605278010	255 S DOUGLAS ST	SINGLE FAMILY RESIDE	173.3061	26	19.36	2962.55	14.09	23	12.08	4409.20	12.47
1605278011	259 S DOUGLAS ST	SINGLE FAMILY RESIDE	190.8798	35	26.77	4096.27	17.22	36	19.24	7022.60	17.72
1605278012	275 S DOUGLAS ST	SINGLE FAMILY RESIDE	327.7535	119	87.96	13457.33	34.11	90	47.01	17158.65	25.79
1605278013	1259 E 300 S # NFF1	VACANT RESIDENTIAL L	82.19913	34	25.58	3913.31	38.85	34	17.32	6321.80	38.85
1605278014	1264 E 200 S	3-4 UNIT APARTMENT	129.667	49	36.92	5648.74	35.50	41	20.88	7621.20	29.70
1605278015	1268 E 200 S	10-19 UNIT APARTMENT	390.5395	181	148.52	22723.71	43.54	183	102.62	37456.30	44.02
1605278016_a	208-212 S 1300 E	MIXED RETAIL	104.0892	28	22.60	3457.67	25.27	28	15.13	5522.45	25.27
1605278016	208-212 S 1300 E	MIXED RETAIL	183.0711	10	7.59	1161.35	5.13	10	5.21	1901.65	5.13
1605278017	216 S 1300 E	OFFICE CONVERSION	183.4444	16	12.76	1951.62	8.19	15	8.86	3233.90	7.68
1605278018	222 S 1300 E	FAST FOOD RESTAURANT	348.8272	181	142.02	21729.37	48.74	171	90.34	32974.10	46.05
1605278019	224 S 1300 E	RESTAURANT	326.6493	6	4.64	709.58	1.73	9	4.86	1773.90	2.59
1605278020	226 S 1300 E	RESTAURANT	283.1552	57	44.63	6829.14	18.91	53	28.45	10384.25	17.58
1605278021	238 S 1300 E	RESTAURANT	408.0846	136	106.91	16357.95	31.31	125	69.69	25436.85	28.77
1605278023	252 S 1300 E	MIXED RETAIL	210.4789	44	33.83	5175.70	19.64	44	24.16	8818.40	19.64
1605278024	258 S 1300 E	RESTAURANT	358.207	140	105.28	16107.34	36.71	140	82.24	30017.60	36.71
1605278027	1259 E 300 S	UNKNOWN	210.346	51	38.92	5954.25	22.78	41	22.02	8037.30	18.31
1605278029	280 S 1300 E	BANK	455.0582	185	148.73	22755.49	38.19	179	97.34	35529.10	36.95
1605279001	1310 E 200 S	MIXED RETAIL	419.662	242	197.15	30164.68	54.17	250	139.92	51070.80	55.96
1605279002	215 S 1300 E	UNKNOWN	507.7339	262	207.19	31699.80	48.47	246	131.41	47964.65	45.51
1605279003	221 S 1300 E	UNKNOWN	193.8981	9	6.45	986.76	4.36	0	0	0.00	0.00
1605279005	235-255 S 1300 E	BANK	594.8639	216	167.96	25698.21	34.11	203	112.66	41120.90	32.06

Roof ID	Site Address	Parcel Land Use	Roof Area meters²	Scenario 1 # of panels	Scenario 1 kWh/Day	Scenario 1 kWh	Scenario 1 % usable roof	Scenario 2 # of panels	Scenario 2 kWh/Day	Scenario 2 kWh	Scenario 2 % usable roof
1605279006	273 S 1300 E	RETAIL STORE	323.6171	43	33.35	5102.20	12.48	40	21.35	7792.75	11.61
1605279008_a	227 S 1300 E # 1	10-19 UNIT APARTMENT	263.2206	157	120.66	18460.48	56.03	153	78.96	28820.40	54.60
1605279008	227 S 1300 E # 1	10-19 UNIT APARTMENT	414.2418	258	211.32	32331.80	58.51	260	144.02	52567.30	58.96
1605279009	227-231 S 1300 E	OFFICE	151.3719	16	11.51	1760.70	9.93	1	0.49	178.85	0.62
1605280001	305 S 1200 E	SINGLE FAMILY RESIDE	185.5413	2	1.38	211.36	1.01	5	2.54	927.10	2.53
1605280001_a	305 S 1200 E	SINGLE FAMILY RESIDE	114.7252	4	2.77	424.36	3.28	1	0.48	175.20	0.82
1605280002	1224 E 300 S	SINGLE FAMILY RESIDE	248.1354	1	0.69	105.98	0.38	1	0.48	175.20	0.38
1605280003	1228 E 300 S	SINGLE FAMILY RESIDE	158.8861	0	0.00	0.00	0.00	0	0	0.00	0.00
1605280004	306 S DOUGLAS ST	SINGLE FAMILY RESIDE	145.1689	5	3.44	526.78	3.24	4	2.01	733.65	2.59
1605280005	315 S 1200 E	SINGLE FAMILY RESIDE	347.279	20	14.31	2189.67	5.41	12	6.32	2306.80	3.25
1605280008	316 S DOUGLAS ST	SINGLE FAMILY RESIDE	133.6405	28	21.12	3231.31	19.68	27	13.67	4989.55	18.98
1605281001	1250-1252 E 300 S	5-9 UNIT APARTMENT	229.5263	86	68.82	10529.81	35.20	76	44.97	16414.05	31.10
1605281002	305 S DOUGLAS ST	APARTMENT CONVERSION	217.7028	49	37.23	5696.13	21.14	45	23.56	8599.40	19.42
1605281003	315 S DOUGLAS ST	SINGLE FAMILY RESIDE	238.9656	38	28.99	4434.85	14.94	35	19.77	7216.05	13.76
1605281004	304 S 1300 E	SINGLE FAMILY RESIDE	251.6617	34	27.24	4167.94	12.69	35	20.15	7354.75	13.06
1605281005	310 S 1300 E	APARTMENT CONVERSION	215.9772	49	35.12	5373.94	21.31	20	10.91	3982.15	8.70
1605281006	316 S 1300 E	SINGLE FAMILY RESIDE	206.8791	39	31.83	4869.84	17.71	54	30.58	11161.70	24.52
1605282002	1314 E 300 S	APARTMENT CONVERSION	151.1685	32	25.05	3832.92	19.88	28	16.36	5971.40	17.40
1605282003	309-311 S 1300 E	MULTIPLE RESIDENTIAL	139.2845	17	12.52	1915.60	11.47	17	9.28	3387.20	11.47
1605282003_a	309-311 S 1300 E	MULTIPLE RESIDENTIAL	88.2549	16	11.83	1809.33	17.03	16	8.61	3142.65	17.03
1605282004	315-319 S 1300 E	MULTIPLE RESIDENTIAL	205.0054	29	22.01	3367.26	13.29	27	15.2	5548.00	12.37
1605282004_a	315-319 S 1300 E	MULTIPLE RESIDENTIAL	114.7038	11	8.06	1233.30	9.01	11	5.84	2131.60	9.01
1605282005	303-305 S 1300 E	DUPLEX	157.3159	13	9.58	1465.62	7.76	18	9.76	3562.40	10.75
1605427001	321 S 1200 E	SINGLE FAMILY RESIDE	157.1854	9	6.77	1036.07	5.38	7	4.02	1467.30	4.18
1605427002	327 S 1200 E	DUPLEX	145.3709	14	9.94	1520.38	9.05	8	4.25	1551.25	5.17
1605427003	333 S 1200 E	SINGLE FAMILY RESIDE	151.6766	25	17.73	2712.76	15.48	29	15.56	5679.40	17.96
1605427004	337 S 1200 E	SINGLE FAMILY RESIDE	168.3971	14	10.26	1570.10	7.81	9	4.83	1762.95	5.02
1605427005	343 S 1200 E	SINGLE FAMILY RESIDE	258.5053	57	42.81	6550.21	20.71	50	25.52	9314.80	18.17

Roof ID	Site Address	Parcel Land Use	Roof Area meters²	Scenario 1 # of panels	Scenario 1 kWh/Day	Scenario 1 kWh	Scenario 1 % usable roof	Scenario 2 # of panels	Scenario 2 kWh/Day	Scenario 2 kWh	Scenario 2 % usable roof
1605427006	351 S 1200 E	SINGLE FAMILY RESIDE	193.2244	25	18.65	2853.81	12.15	22	11.15	4069.75	10.70
1605427007	357 S 1200 E	SINGLE FAMILY RESIDE	174.9998	19	13.19	2018.57	10.20	2	0.98	357.70	1.07
1605427009	322 S DOUGLAS ST	SINGLE FAMILY RESIDE	184.0548	61	47.53	7272.21	31.13	43	25.28	9227.20	21.95
1605427010	330 S DOUGLAS ST	SINGLE FAMILY RESIDE	249.2073	36	26.68	4081.63	13.57	23	12.82	4679.30	8.67
1605427011	334 S DOUGLAS ST	SINGLE FAMILY RESIDE	198.1112	47	36.51	5586.56	22.29	43	25.07	9150.55	20.39
1605427012	336 S DOUGLAS ST	SINGLE FAMILY RESIDE	186.1189	34	26.04	3983.87	17.16	40	22.59	8245.35	20.19
1605427013	342 S DOUGLAS ST	SINGLE FAMILY RESIDE	185.223	21	16.39	2507.42	10.65	22	12.67	4624.55	11.16
1605427014	348 S DOUGLAS ST	SINGLE FAMILY RESIDE	265.3484	39	30.43	4656.26	13.81	42	23.26	8489.90	14.87
1605427015	358 S DOUGLAS ST	MULTIPLE RESIDENTIAL	199.2803	63	47.67	7293.31	29.70	43	23.7	8650.50	20.27
1605427015_a	358 S DOUGLAS ST	MULTIPLE RESIDENTIAL	105.7312	27	20.21	3092.47	23.99	22	10.94	3993.10	19.55
1605427016	364 S DOUGLAS ST	SINGLE FAMILY RESIDE	218.7586	67	49.89	7632.99	28.77	63	31.91	11647.15	27.05
1605427017	1203 E 400 S	SINGLE FAMILY RESIDE	167.5887	18	12.91	1975.61	10.09	13	6.9	2518.50	7.29
1605427018	1209 E 400 S	SINGLE FAMILY RESIDE	162.2611	21	15.87	2428.63	12.16	21	11.97	4369.05	12.16
1605427019	1215 E 400 S	SINGLE FAMILY RESIDE	153.5139	54	41.15	6295.51	33.04	40	21.03	7675.95	24.48
1605427020	1219 E 400 S	SINGLE FAMILY RESIDE	111.5094	22	15.39	2354.06	18.53	6	2.96	1080.40	5.05
1605427021	1225 E 400 S	SINGLE FAMILY RESIDE	122.9537	10	7.06	1080.00	7.64	5	2.63	959.95	3.82
1605427022	1231 E 400 S	SINGLE FAMILY RESIDE	110.1957	15	11.08	1695.11	12.79	15	8.25	3011.25	12.79
1605428001	319 S DOUGLAS ST	SINGLE FAMILY RESIDE	186.9304	48	36.59	5598.07	24.12	32	18.29	6675.85	16.08
1605428002	327 S DOUGLAS ST	SINGLE FAMILY RESIDE	228.2021	43	31.78	4863.03	17.70	25	13.51	4931.15	10.29
1605428003	333 S DOUGLAS ST	SINGLE FAMILY RESIDE	157.0265	7	4.78	731.93	4.19	2	1.01	368.65	1.20
1605428004	339 S DOUGLAS ST	SINGLE FAMILY RESIDE	191.4984	27	20.03	3064.62	13.24	20	11.22	4095.30	9.81
1605428005	345 S DOUGLAS ST	SINGLE FAMILY RESIDE	193.0332	23	16.85	2578.20	11.19	18	9.86	3598.90	8.76
1605428006	351 S DOUGLAS ST	SINGLE FAMILY RESIDE	203.5254	14	10.23	1565.12	6.46	11	6.23	2273.95	5.08
1605428007_a	355 S DOUGLAS ST	SINGLE FAMILY RESIDE	111.2357	1	0.72	109.45	0.84	0	0	0.00	0.00
1605428007	355 S DOUGLAS ST	SINGLE FAMILY RESIDE	220.8829	39	29.25	4474.97	16.59	30	15.61	5697.65	12.76
1605428008	363 S DOUGLAS ST	SINGLE FAMILY RESIDE	117.652	7	5.05	772.23	5.59	2	1.19	434.35	1.60
1605428009	371 S DOUGLAS ST	SINGLE FAMILY RESIDE	137.1409	33	23.90	3657.35	22.60	19	9.57	3493.05	13.01
1605428010	1253 E 400 S	UNKNOWN	197.3911	47	35.16	5379.54	22.37	39	20.14	7351.10	18.56

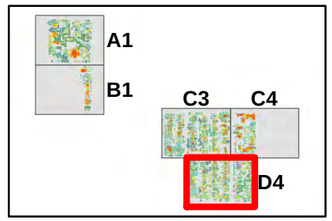
Roof ID	Site Address	Parcel Land Use	Roof Area meters²	Scenario 1 # of panels	Scenario 1 kWh/Day	Scenario 1 kWh	Scenario 1 % usable roof	Scenario 2 # of panels	Scenario 2 kWh/Day	Scenario 2 kWh	Scenario 2 % usable roof
1605428011	322 S 1300 E	SINGLE FAMILY RESIDE	193.1283	68	53.41	8171.69	33.07	52	30.61	11172.65	25.29
1605428012	330 S 1300 E	SINGLE FAMILY RESIDE	253.6293	73	55.08	8427.29	27.04	48	26.22	9570.30	17.78
1605428013	334 S 1300 E	CHURCH	283.9121	72	55.25	8453.25	23.82	78	40.86	14913.90	25.81
1605428014	340 S 1300 E	SINGLE FAMILY RESIDE	229.8225	72	54.57	8349.37	29.43	50	28.26	10314.90	20.44
1605428015	344 S 1300 E	SINGLE FAMILY RESIDE	139.6188	28	21.36	3268.77	18.84	28	14.8	5402.00	18.84
1605428016	354 S 1300 E	SINGLE FAMILY RESIDE	245.2524	56	40.75	6234.83	21.45	22	11.51	4201.15	8.43
1605428017	360 S 1300 E	SINGLE FAMILY RESIDE	175.696	44	33.06	5058.93	23.52	41	22.88	8351.20	21.92
1605428018	364 S 1300 E	SINGLE FAMILY RESIDE	225.0506	53	41.22	6305.93	22.12	51	28.43	10376.95	21.29
1605428020	1259 E 400 S	SINGLE FAMILY RESIDE	106.3676	32	22.45	3435.40	28.26	10	4.95	1806.75	8.83
1605428021	1263-1265 S 400 E	SINGLE FAMILY RESIDE	204.3457	29	21.52	3291.92	13.33	22	11.2	4088.00	10.11
1605428022	1271 E 400 S	SINGLE FAMILY RESIDE	186.4038	30	22.51	3443.50	15.12	23	12.54	4577.10	11.59
1605428023	378 S 1300 E	SINGLE FAMILY RESIDE	267.5466	40	28.89	4420.49	14.04	29	14.46	5277.90	10.18
1605428024	1255-1261 E 400 S	DUPLEX	138.5363	40	31.14	4764.26	27.12	37	20.74	7570.10	25.09
1605428025	1255-1261 E 400 S	SINGLE FAMILY RESIDE	133.8838	30	21.10	3228.44	21.05	4	1.98	722.70	2.81
1605429001	327 S 1300 E	MULTIPLE RESIDENTIAL	146.1817	24	17.91	2740.41	15.42	23	12.52	4569.80	14.78
1605429001_a	327 S 1300 E	MULTIPLE RESIDENTIAL	125.8954	20	15.16	2318.78	14.92	20	11.3	4124.50	14.92
1605429002	333 S 1300 E	SINGLE FAMILY RESIDE	121.4191	1	0.67	103.22	0.77	0	0	0.00	0.00
1605429003	339 S 1300 E	MULTIPLE RESIDENTIAL	132.6133	8	5.87	898.75	5.67	9	4.81	1755.65	6.38
1605429004	343 S 1300 E	3-4 UNIT APARTMENT	104.4885	33	25.46	3895.65	29.67	33	19.39	7077.35	29.67
1605429006	355 S 1300 E	SINGLE FAMILY RESIDE	167.523	41	30.68	4693.45	22.99	40	20.51	7486.15	22.43
1605429007	357 S 1300 E	SINGLE FAMILY RESIDE	116.3214	9	6.73	1030.01	7.27	7	4.01	1463.65	5.65
1605429008	361 S 1300 E	SINGLE FAMILY RESIDE	235.9425	52	38.60	5906.31	20.70	36	19.19	7004.35	14.33
1605429009	367-369 S 1300 E	DUPLEX	147.0554	27	19.98	3057.44	17.25	22	12.03	4390.95	14.05
1605429011	1303 E 400 S	SINGLE FAMILY RESIDE	190.0401	42	29.71	4545.23	20.76	18	9.07	3310.55	8.90
1605429012	1309 E 400 S	DUPLEX	179.5946	40	30.03	4594.01	20.92	28	15.77	5756.05	14.65
1605429013	1311 E 400 S	SINGLE FAMILY RESIDE	132.9194	30	21.46	3282.63	21.20	15	7.41	2704.65	10.60
1605429014	351 S 1300 E	SINGLE FAMILY RESIDE	150.1047	27	20.94	3203.61	16.90	27	15.5	5657.50	16.90

APPENDIX D

Average Daily Insolation and Estimated Panels per Rooftop Maps

Scenario 1 May-September Estimated Average Daily Insolation (kWh/m²)

Page 1 of 5



Legend

- Study Area
- **Average Daily Insolation/Summer kWh/m²**
  - High : 7.29
  - Low : 0.006
- Parcels
- Map Page
- LiDAR Derived Tree Cover

N

0 20 40 Meters

0 75 150 Feet

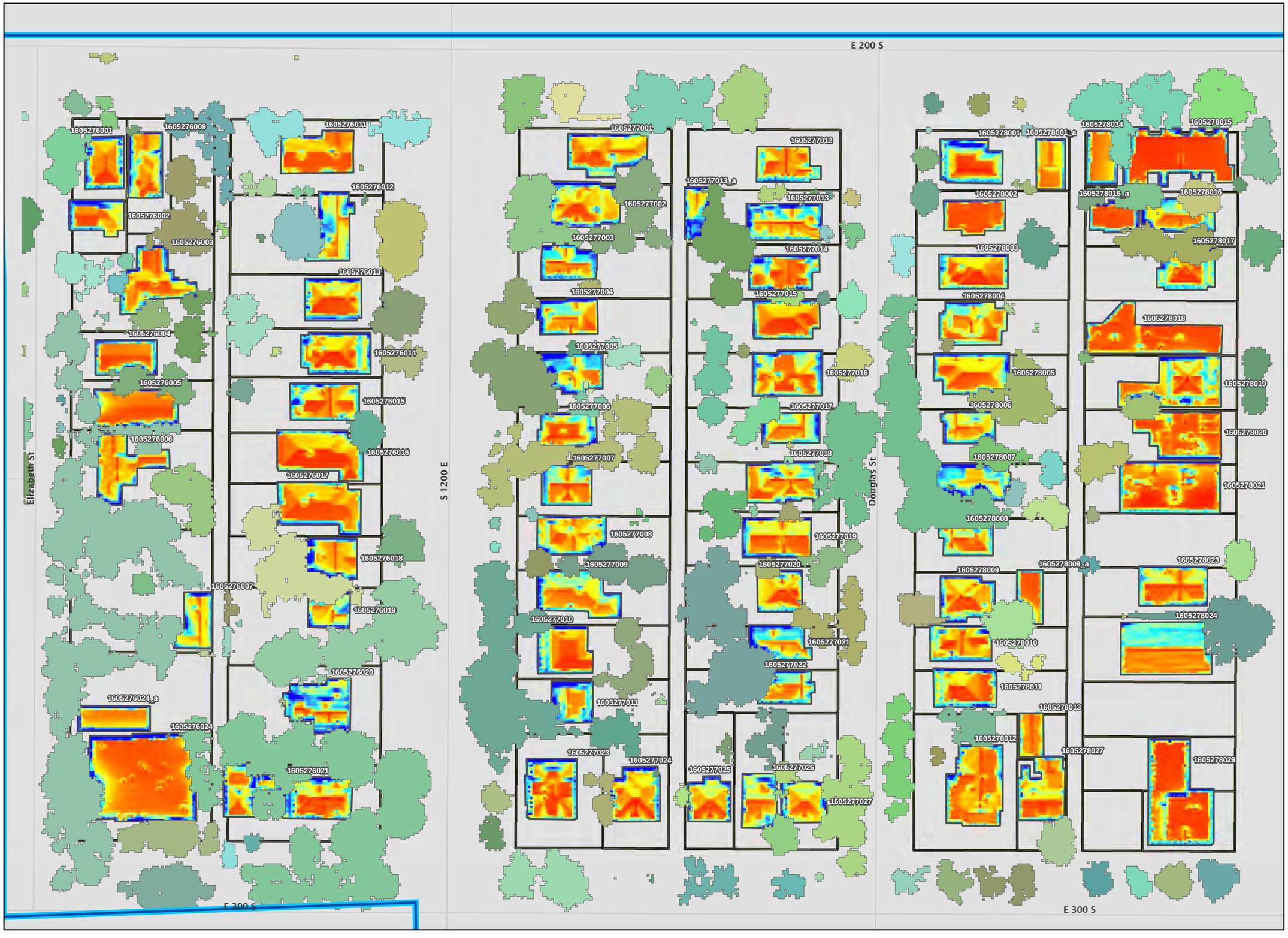
ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

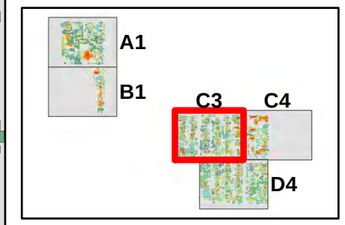
Data Management/
Geographic Information Systems
gisdept@pacificorp.com

Data are projected in Utah State Plane Central, feet.

U:\Projects\2010\10-229\Scenario 1 Maps.mxd 12/31/10 gisdept@pacificorp.com

Scenario 1 May-September Estimated Average Daily Insolation (kWh/m²)





Legend

- Study Area
- **Average Daily Insolation/Summer kWh/m²**
  - High : 7.29
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- Map Page
- LiDAR Derived Tree Cover

N

0 20 40 Meters

0 75 150 Feet

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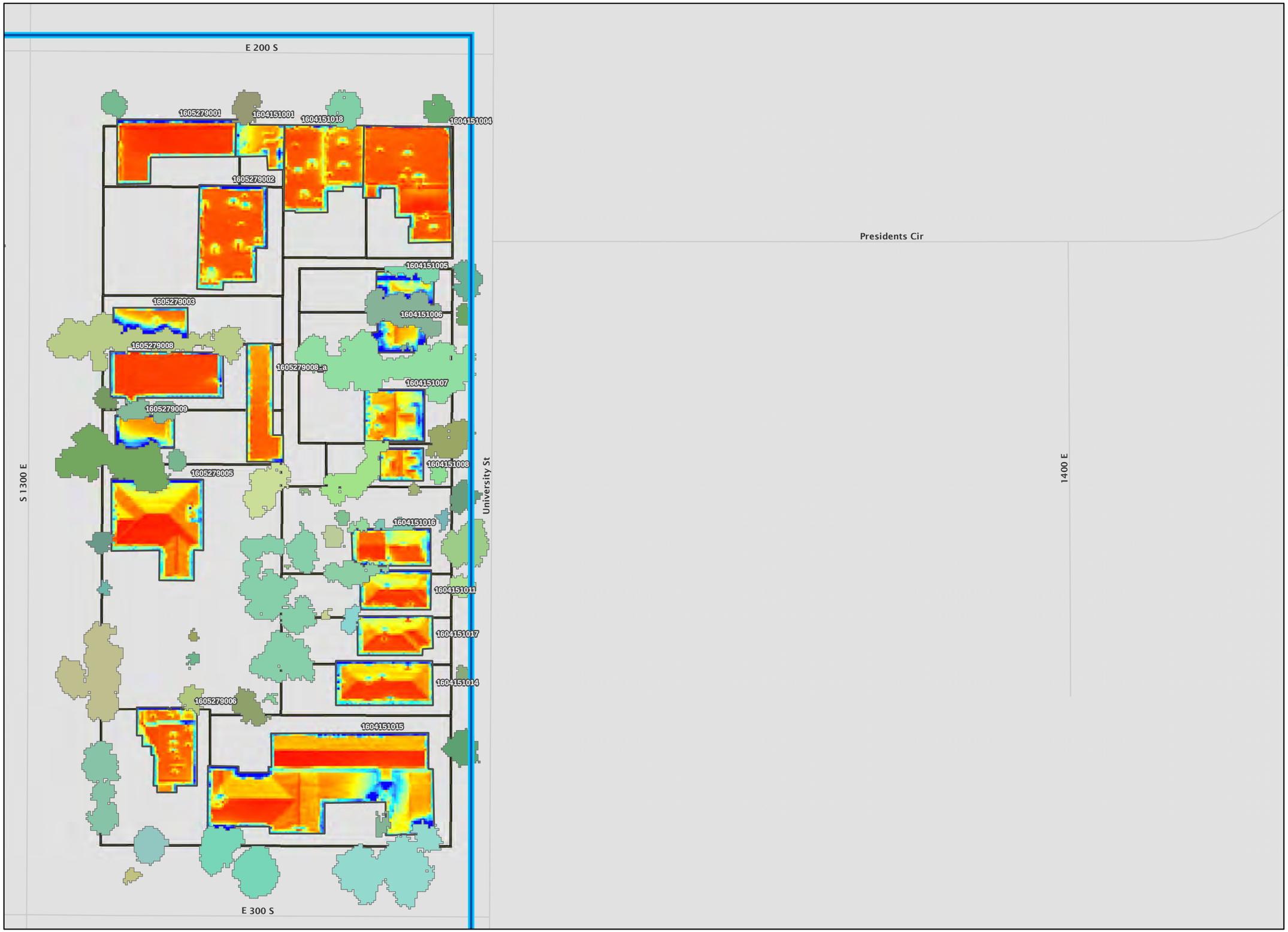
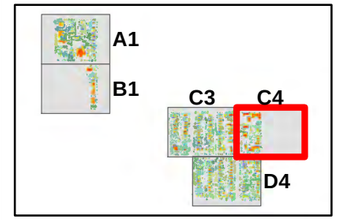


Scenario 1 May-September Estimated Average Daily Insolation (kWh/m²)



Legend

Study Area

Average Daily Insolation/Summer kWh/m²

High : 7.29

Low : 0.006

Parcels

Map Page

LiDAR Derived Tree Cover

N

0 20 40 Meters

0 75 150 Feet

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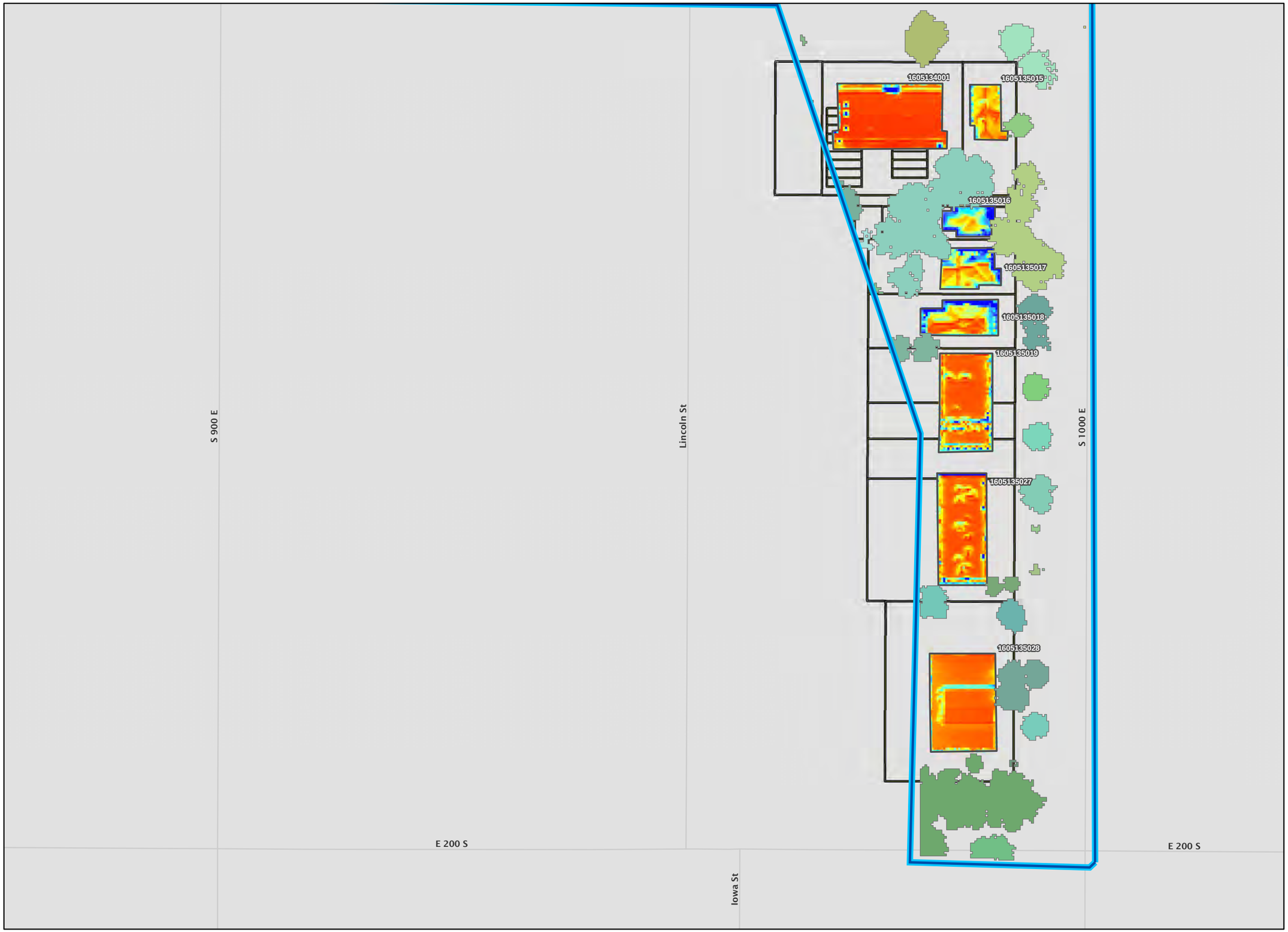
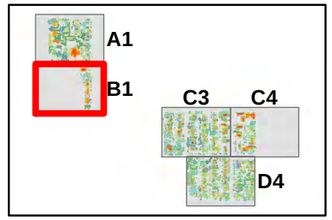
Data are projected in Utah State Plane Central, feet.

Scenario 1
May-September Estimated Average Daily Insolation (kWh/m²)





Legend

- Study Area
- **Average Daily Insolation/Summer kWh/m²**
  - High : 7.29
  - Low : 0.006
- Parcels
- Map Page
- LiDAR Derived Tree Cover

N

0 20 40 Meters

0 75 150 Feet

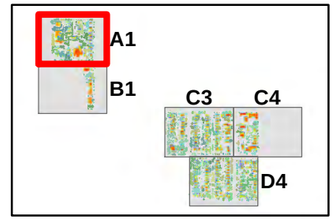
ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

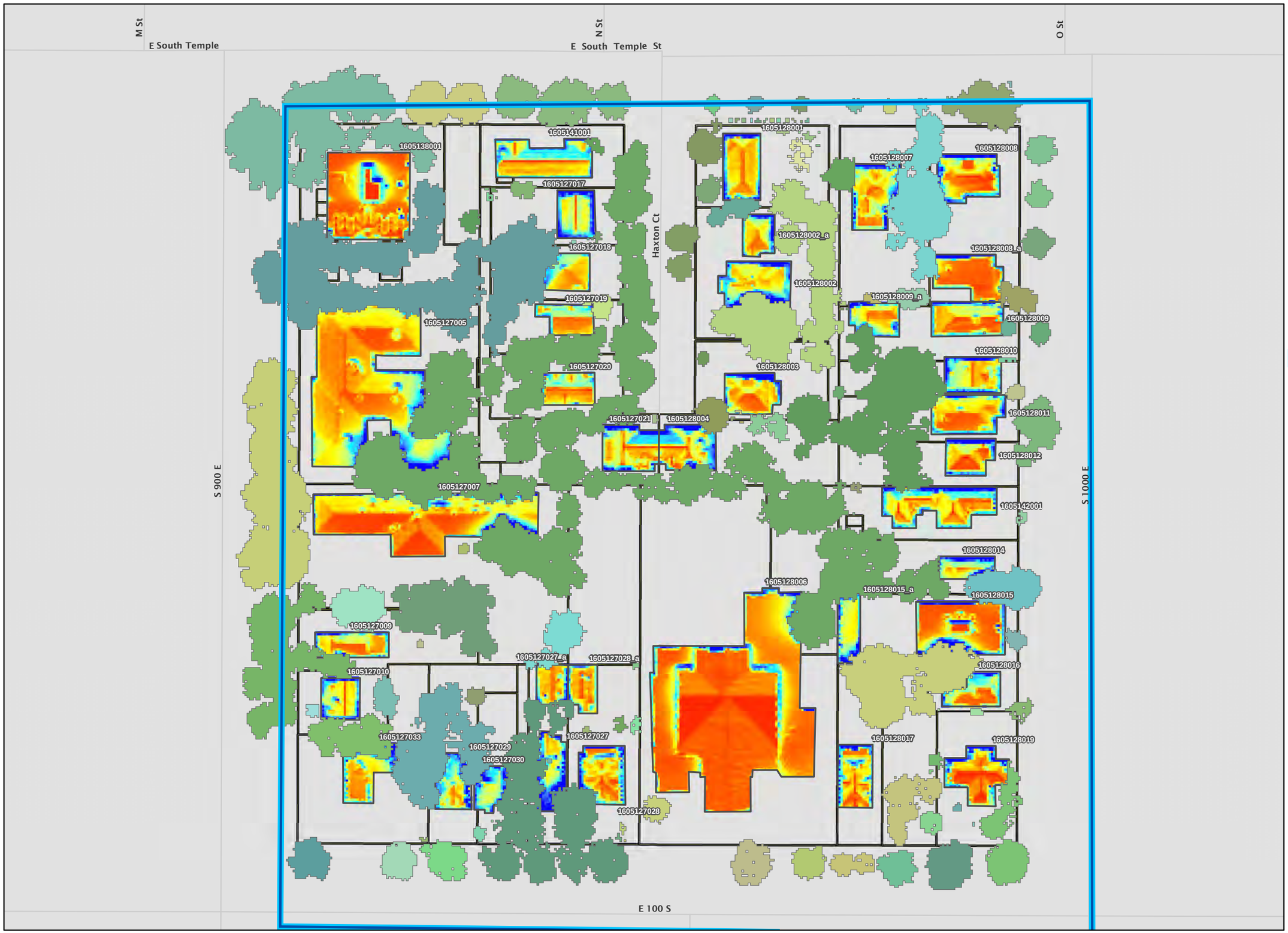
Data Management/
Geographic Information Systems
gisdept@pacificorp.com

Data are projected in Utah State Plane Central, feet.

Scenario 1 May-September Estimated Average Daily Insolation (kWh/m²)

Page 5 of 5





Legend

- Study Area
- **Average Daily Insolation/Summer kWh/m²**
  - High : 7.29
  - Low : 0.006
- Parcels
- Map Page
- LiDAR Derived Tree Cover

N

0 20 40 Meters

0 75 150 Feet

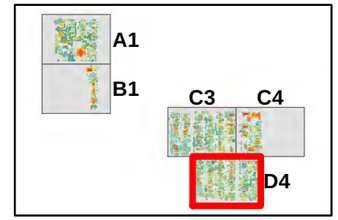
ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

Data Management/
Geographic Information Systems
gisdept@pacificorp.com

Data are projected in Utah State Plane Central, feet.

U:\Projects\2010\10-229\Scenario 1 Maps.mxd 12/31/10 gisdept@pacificorp.com

Scenario 1
of Panels and Estimated Average Daily Energy Output (kWh)



Legend

Study Area

Parcels

Two PV Panels

One PV Panel

LiDAR Derived Tree Cover

N

0 15 30
Meters

0 75 150
Feet

ROCKY MOUNTAIN POWER
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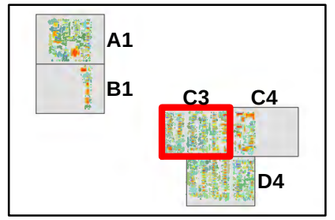
Geographic Information Systems
gisdept@pacificorp.com

Data are projected in Utah State Plane Central, feet.

Scenario 1
of Panels and Estimated Average Daily Energy Output (kWh)



Legend

Study Area

Parcels

Two PV Panels

One PV Panel

LiDAR Derived Tree Cover

N

0 15 30
Meters

0 75 150
Feet

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

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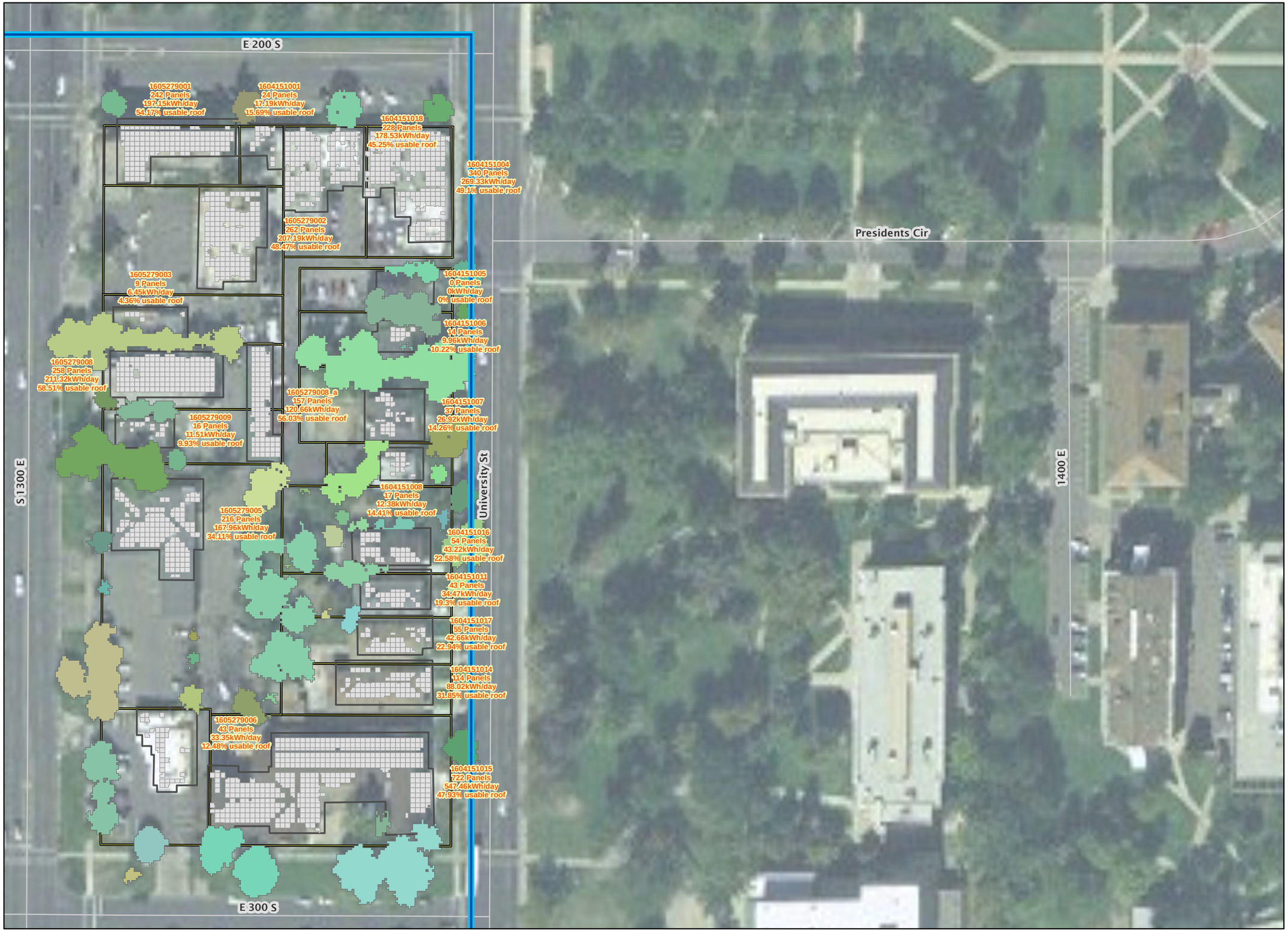
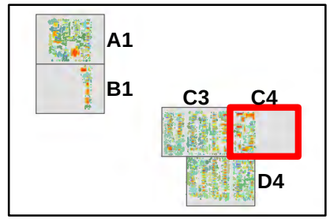
Geographic Information Systems
gisdept@pacificorp.com

Data are projected in Utah State Plane Central, feet.

Scenario 1
of Panels and Estimated Average Daily Energy Output (kWh)





Legend

Study Area

Parcels

Two PV Panels

One PV Panel

LiDAR Derived Tree Cover

N

0 15 30 Meters

0 75 150 Feet

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

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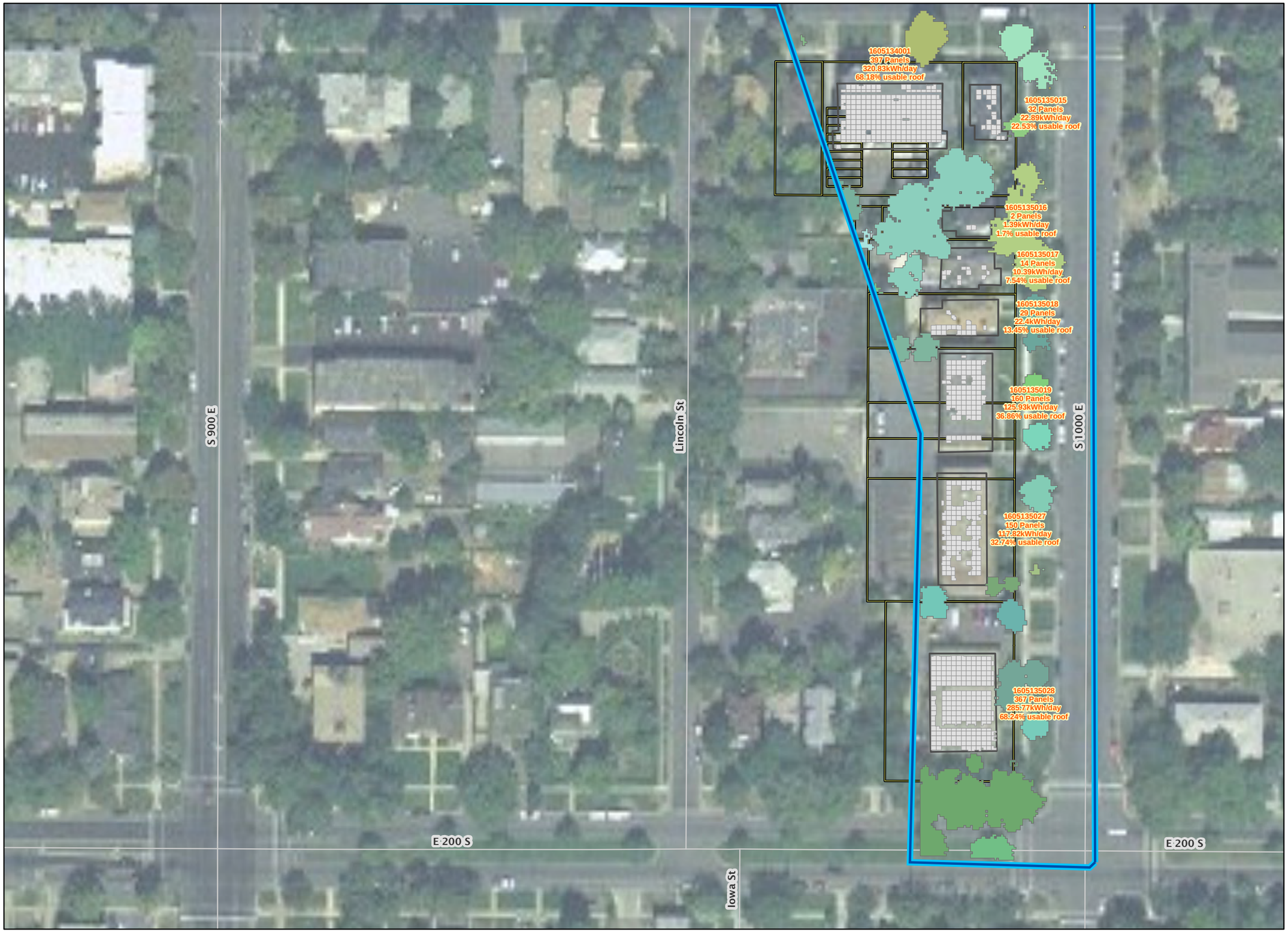
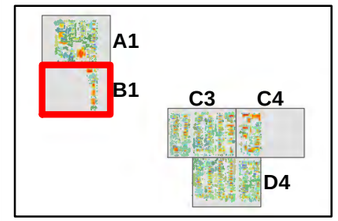
Geographic Information Systems
gisdept@pacificorp.com

Data are projected in Utah State Plane Central, feet.

Scenario 1
of Panels and Estimated Average Daily Energy Output (kWh)





Legend

Study Area

Parcels

Two PV Panels

One PV Panel

LiDAR Derived Tree Cover

N

0 15 30
Meters

0 75 150
Feet

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

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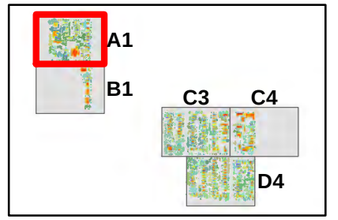
Geographic Information Systems
gisdept@pacificorp.com

Data are projected in Utah State Plane Central, feet.

Scenario 1
of Panels and Estimated Average Daily Energy Output (kWh)



Legend

Study Area

Parcels

Two PV Panels

One PV Panel

LiDAR Derived Tree Cover

N

0 15 30 Meters

0 75 150 Feet

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

Data Management/
Geographic Information Systems
gisdept@pacificorp.com

Data are projected in Utah State Plane Central, feet.

M St
N St
O St
E South Temple St
S 900 E
S 1000 E
Haxton Ct
E 100 S

1605141001
74 Panels
52.46kWh/day
26.22% usable roof

1605138001
207 Panels
158.35kWh/day
34.68% usable roof

1605127017
0 Panels
0kWh/day
0% usable roof

1605127018
32 Panels
22.67kWh/day
21.05% usable roof

1605127019
35 Panels
26.31kWh/day
27.75% usable roof

1605127005
37.1 Panels
274.07kWh/day
25.14% usable roof

1605127020
26 Panels
19.69kWh/day
18.12% usable roof

1605127021
18 Panels
13.29kWh/day
8.71% usable roof

1605127007
204 Panels
159.36kWh/day
22.97% usable roof

1605128007
14 Panels
9.95kWh/day
5.71% usable roof

1605128001
61 Panels
42.81kWh/day
29.4% usable roof

1605128008
45 Panels
34.25kWh/day
19.27% usable roof

1605128002_a
11 Panels
7.81kWh/day
10.1% usable roof

1605128002
6 Panels
4.15kWh/day
2.41% usable roof

1605128008_a
47 Panels
36.86kWh/day
20.73% usable roof

1605128009
42 Panels
32.01kWh/day
20.41% usable roof

1605128009_a
8 Panels
5.8kWh/day
5.78% usable roof

1605128010
13 Panels
9.23kWh/day
7.68% usable roof

1605128003
41 Panels
30.01kWh/day
22.47% usable roof

1605128011
36 Panels
27.72kWh/day
15.65% usable roof

1605128004
15 Panels
11.01kWh/day
7.16% usable roof

1605128012
23 Panels
17.77kWh/day
16.22% usable roof

1605142001
30 Panels
21.62kWh/day
9.09% usable roof

1605128015_a
0 Panels
0kWh/day
0% usable roof

1605128014
2 Panels
1.36kWh/day
1.9% usable roof

1605127009
30 Panels
22.21kWh/day
19.24% usable roof

1605127027_a
24 Panels
16.97kWh/day
22.91% usable roof

1605127010
10 Panels
6.76kWh/day
7.43% usable roof

1605127028_a
23 Panels
16.45kWh/day
20.64% usable roof

1605127029
2 Panels
1.43kWh/day
1.27% usable roof

1605128006
91.7 Panels
721.95kWh/day
43.36% usable roof

1605128015
159 Panels
122.57kWh/day
40.53% usable roof

1605128016
19 Panels
13.48kWh/day
13.05% usable roof

1605128017
15 Panels
10.72kWh/day
8.22% usable roof

1605128019
36 Panels
27.35kWh/day
15.81% usable roof

1605127033
31 Panels
22.62kWh/day
14.76% usable roof

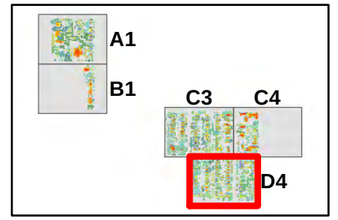
1605127030
0 Panels
0kWh/day
0% usable roof

1605127027
10 Panels
6.91kWh/day
5.18% usable roof

1605127028
6 Panels
4.39kWh/day
2.67% usable roof

Scenario 2
Estimated Average Daily Insolation/Year (kWh/m²)

Page 1 of 5



Legend

- Study Area
- **Average Daily Insolation/Year**
  kWh/m²
  High : 5.3
  Low : 0.005
- Parcels
- Map Page
- LiDAR Derived Tree Cover

N

0 20 40 Meters

0 85 170 Feet

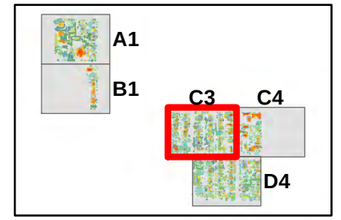
ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

Data Management/
Geographic Information Systems
gisdept@pacificorp.com

Data are projected in Utah State Plane Central, feet.

U:\Projects\2010\10-229\Scenario 2 Maps.mxd 12/31/10 gisdept@pacificorp.com

Scenario 2
Estimated Average Daily Insolation/Year (kWh/m²)



Legend

- Study Area
- **Average Daily Insolation/Year**
  kWh/m²
  High : 5.3
  Low : 0.005
- Parcels
- Map Page
- LiDAR Derived Tree Cover

N

0 20 40 Meters

0 85 170 Feet

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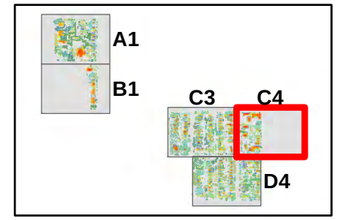
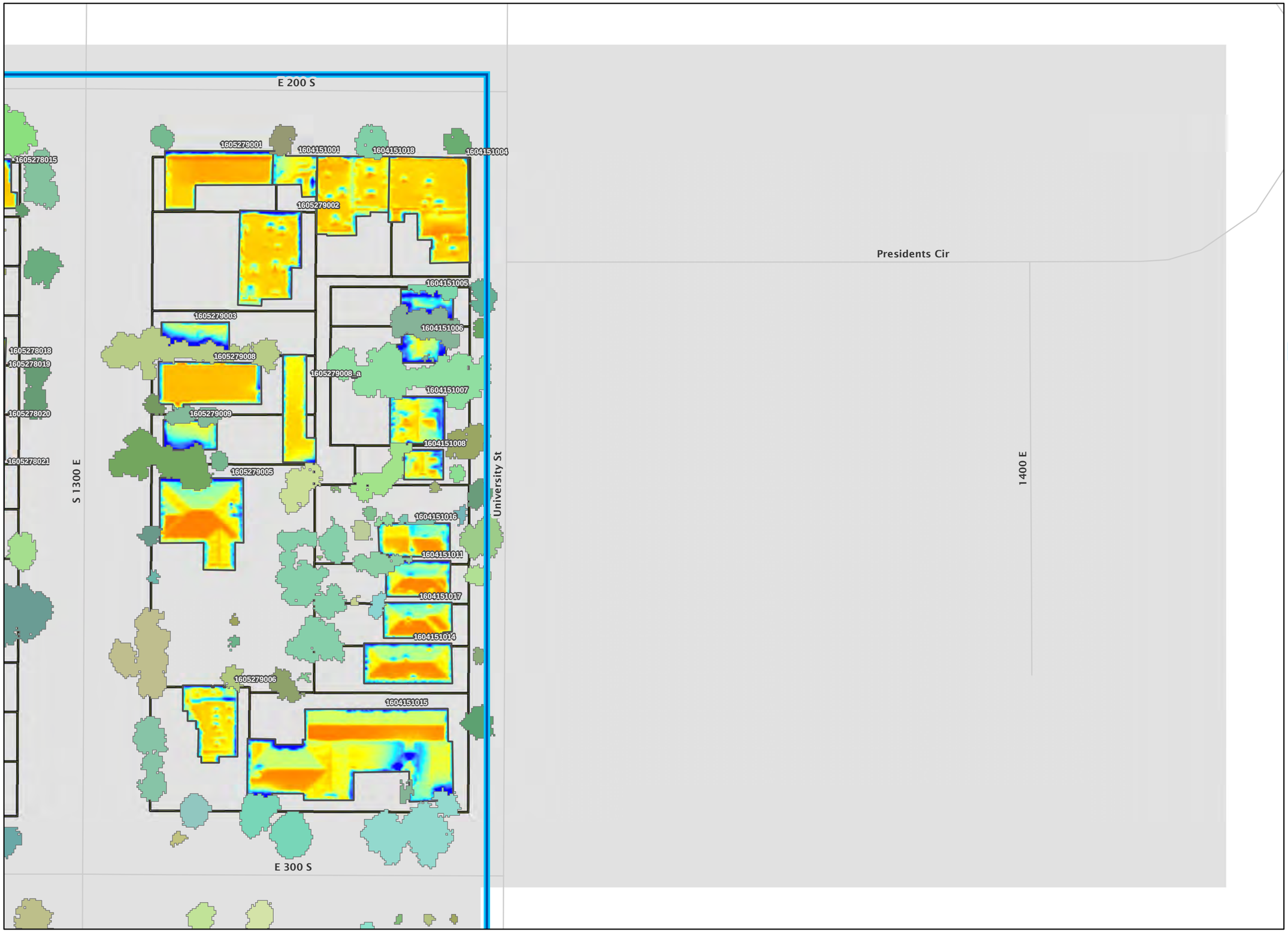
Scenario 2
Estimated Average Daily Insolation/Year (kWh/m²)





Legend

- Study Area
- **Average Daily Insolation/Year**
- **kWh/m²**
- High : 5.3
- Low : 0.005
- Parcels
- Map Page
- LiDAR Derived Tree Cover

N

0 20 40 Meters

0 85 170 Feet

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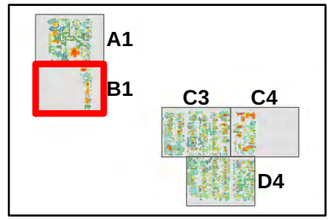
Scenario 2
Estimated Average Daily Insolation/Year (kWh/m²)



Legend

- Study Area
- **Average Daily Insolation/Year**
  kWh/m²
  - High : 5.3
  - Low : 0.005
- Parcels
- Map Page
- LiDAR Derived Tree Cover

N

0 20 40 Meters

0 85 170 Feet

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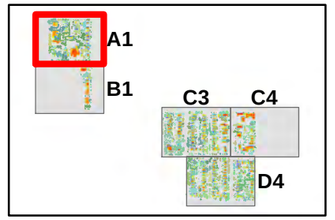
Scenario 2
Estimated Average Daily Insolation/Year (kWh/m²)



Legend

- Study Area
- **Average Daily Insolation/Year**
  kWh/m²
  High : 5.3
  Low : 0.005
- Parcels
- Map Page
- LiDAR Derived Tree Cover

N

0 20 40 Meters

0 85 170 Feet

ROCKY MOUNTAIN POWER
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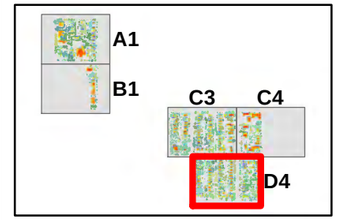
gisdept@pacificorp.com

Data are projected in Utah State Plane Central, feet.

U:\Projects\2010\10-229\Scenario 2 Maps.mxd 12/31/10 gisdept@pacificorp.com

Scenario 2
of Panels and Estimated Daily Energy Outpu (kWh)



Legend

Study Area

Parcels

Two PV Panels

One PV Panel

LiDAR Derived Tree Cover

N

0 15 30 Meters

0 75 150 Feet

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

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Geographic Information Systems
gisdept@pacificorp.com

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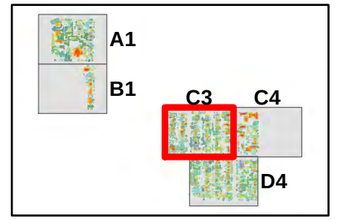
Scenario 2
of Panels and Estimated Daily Energy Outpu (kWh)



Legend

Study Area

Parcels

Two PV Panels

One PV Panel

LiDAR Derived Tree Cover

N

0 15 30 Meters

0 75 150 Feet

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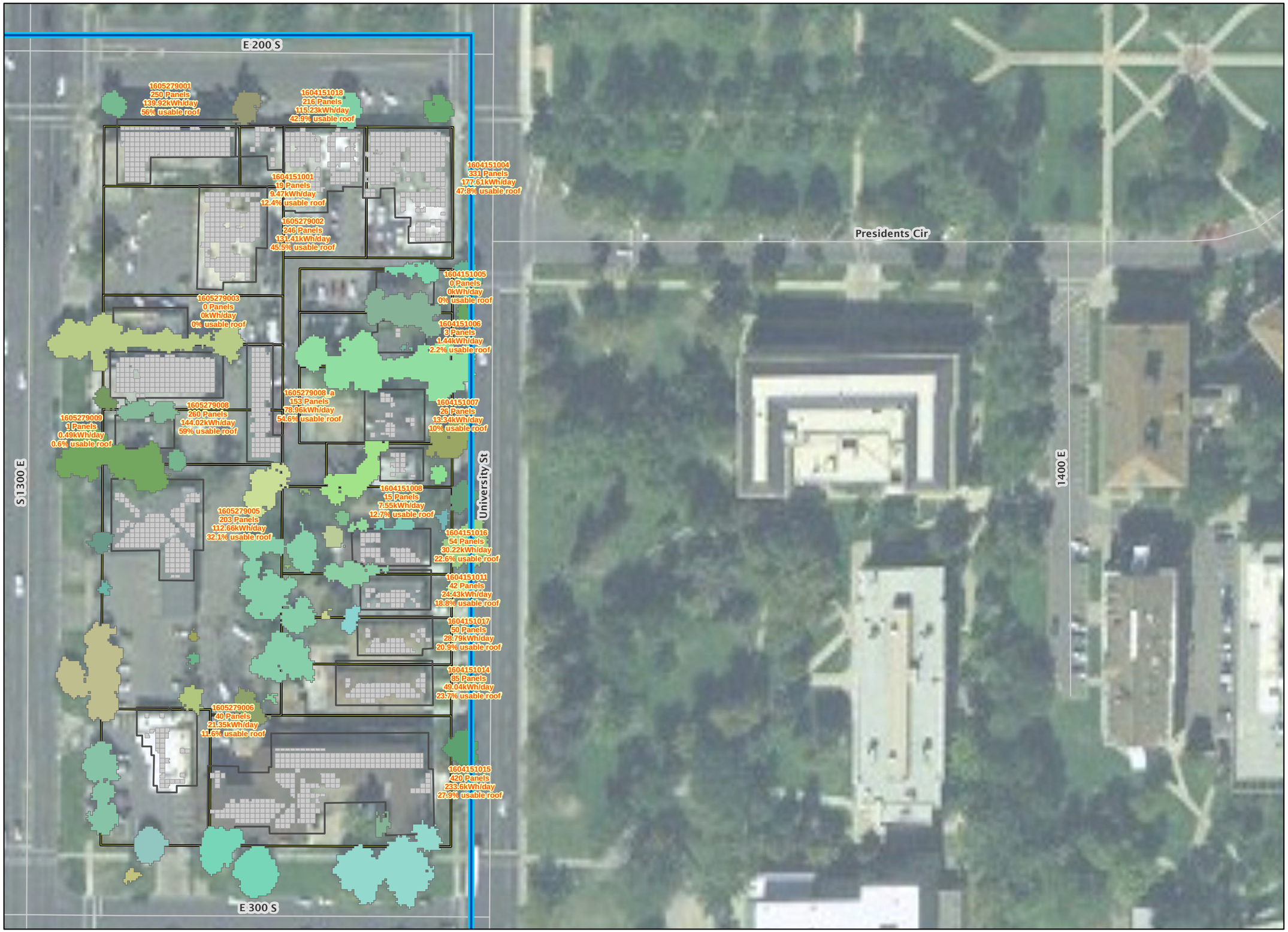
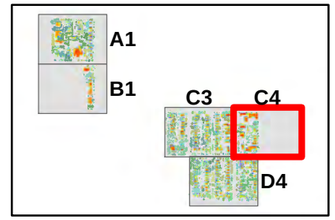


Scenario 2 # of Panels and Estimated Daily Energy Outpu (kWh)



Legend

Study Area

Parcels

Two PV Panels

One PV Panel

LiDAR Derived Tree Cover

N

0 15 30
Meters

0 75 150
Feet

ROCKY MOUNTAIN POWER
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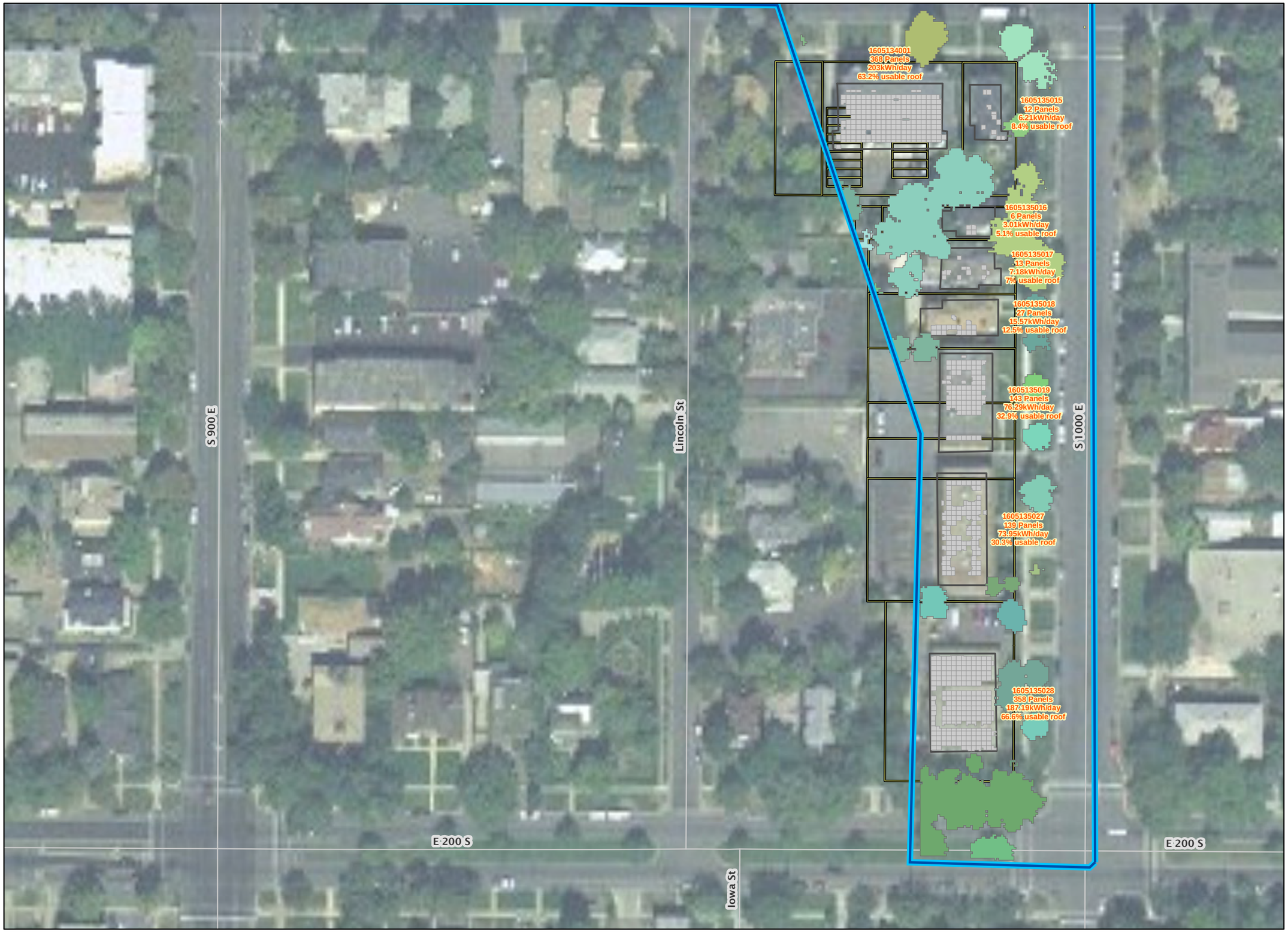
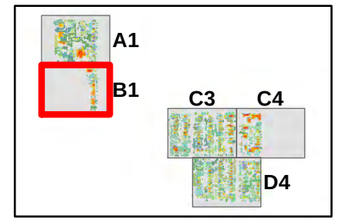
gisdept@pacificorp.com

Data are projected in Utah State Plane Central, feet.



Scenario 2
of Panels and Estimated Daily Energy Outpu (kWh)



Legend

Study Area

Parcels

Two PV Panels

One PV Panel

LiDAR Derived Tree Cover

N

0 15 30
Meters

0 75 150
Feet

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

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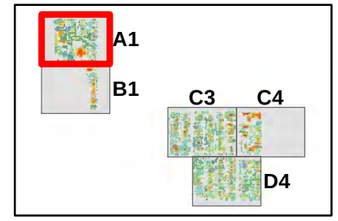
gisdept@pacificorp.com

Data are projected in Utah State Plane Central, feet.

Scenario 2
of Panels and Estimated Daily Energy Outpu (kWh)

Page 5 of 5



Legend

Study Area

Parcels

Two PV Panels

One PV Panel

LiDAR Derived Tree Cover

N

0 15 30 Meters

0 75 150 Feet

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

Data Management/
Geographic Information Systems
gisdept@pacificorp.com

Data are projected in Utah State Plane Central, feet.

APPENDIX E

NASA Surface Meteorology and Solar Energy Report

and

WBAN24127 Station Report

NASA Surface meteorology and Solar Energy - Available Tables

Monthly Averaged Insolation Clearness Index (0 to 1.0)

Lat 40.75 Lon -111.88	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average
22-year Average K	0.55	0.56	0.58	0.57	0.59	0.63	0.63	0.60	0.62	0.60	0.54	0.55	0.58
Minimum K	0.48	0.47	0.52	0.49	0.51	0.56	0.57	0.56	0.55	0.52	0.45	0.48	0.52
Maximum K	0.62	0.63	0.66	0.65	0.65	0.69	0.67	0.68	0.69	0.70	0.60	0.61	0.65

Monthly Averaged Insolation Normalized Clearness Index (0 to 1.0)

Lat 40.75 Lon -111.88	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
22-year Average	0.51	0.51	0.53	0.52	0.54	0.58	0.57	0.55	0.56	0.55	0.49	0.50

Monthly Averaged Clear Sky Insolation Clearness Index (0 to 1.0)

Lat 40.75 Lon -111.88	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
22-year Average	0.75	0.77	0.80	0.80	0.79	0.76	0.74	0.71	0.74	0.75	0.75	0.74

Monthly Averaged Clear Sky Insolation Normalized Clearness Index (0 to 1.0)

Lat 40.75 Lon -111.88	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
22-year Average	0.69	0.71	0.73	0.73	0.72	0.70	0.68	0.64	0.68	0.69	0.69	0.68

Parameters for Tilted Solar Panels:

Monthly Averaged Radiation Incident On An Equator-Pointed Tilted Surface (kWh/m^2/day)													
Lat 40.75 Lon - 111.88	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Average
SSE HRZ	2.33	3.19	4.51	5.57	6.59	7.38	7.14	6.14	5.18	3.79	2.48	2.08	4.70
K	0.55	0.56	0.58	0.57	0.59	0.63	0.63	0.60	0.62	0.60	0.54	0.55	0.58
Diffuse	0.69	0.97	1.31	1.77	2.04	2.02	1.96	1.79	1.35	1.01	0.78	0.61	1.36
Direct	4.75	5.22	6.19	6.35	7.14	8.26	8.04	7.05	6.92	6.08	4.63	4.56	6.27
Tilt 0	2.32	3.11	4.47	5.54	6.55	7.40	7.08	6.11	5.10	3.76	2.46	2.07	4.67
Tilt 25	3.68	4.28	5.45	5.95	6.52	7.05	6.93	6.36	5.96	5.07	3.71	3.47	5.38
Tilt 40	4.24	4.67	5.65	5.79	6.07	6.41	6.36	6.07	6.05	5.48	4.19	4.06	5.42
Tilt 55	4.54	4.80	5.54	5.33	5.31	5.45	5.47	5.47	5.81	5.59	4.44	4.40	5.18
Tilt 90	4.20	4.06	4.16	3.40	2.95	2.79	2.88	3.26	4.08	4.61	4.00	4.17	3.71
OPT	4.60	4.80	5.65	5.95	6.65	7.40	7.15	6.39	6.06	5.59	4.46	4.49	5.77
OPT ANG	64.0	55.0	42.0	25.0	12.0	3.00	9.00	19.0	37.0	52.0	62.0	67.0	37.1

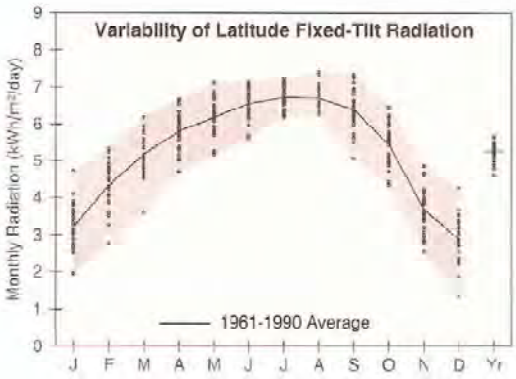
NOTE:	*Diffuse radiation, direct normal radiation and tilted surface radiation are not calculated when the clearness index (K) is below 0.3 or above 0.8.*

Salt Lake City, UT

WBAN NO. 24127

LATITUDE: 40.77° N
LONGITUDE: 111.97° W
ELEVATION: 1288 meters
MEAN PRESSURE: 872 millibars

STATION TYPE: Primary



Solar Radiation for Flat-Plate Collectors Facing South at a Fixed Tilt (kWh/m²/day), Uncertainty ±9%

Tilt (°)		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
0	Average	1.9	2.9	4.1	5.4	6.5	7.4	7.3	6.5	5.2	3.7	2.2	1.7	4.6
	Min/Max	1.5/2.4	2.2/3.3	3.0/4.7	4.5/6.1	5.5/7.5	6.2/8.1	6.7/7.9	6.0/7.2	4.3/5.9	3.1/4.2	1.8/2.7	1.1/2.1	4.2/4.9
Latitude -15	Average	2.9	4.0	5.0	5.9	6.6	7.2	7.3	7.0	6.3	5.0	3.3	2.5	5.2
	Min/Max	1.9/4.1	2.7/4.8	3.5/5.9	4.8/6.8	5.5/7.6	6.1/7.9	6.7/7.9	6.5/7.7	5.0/7.2	4.1/5.9	2.3/4.3	1.3/3.6	4.6/5.6
Latitude	Average	3.2	4.3	5.2	5.8	6.2	6.6	6.7	6.7	6.4	5.4	3.7	2.9	5.3
	Min/Max	2.0/4.7	2.8/5.3	3.6/6.2	4.7/6.7	5.2/7.1	5.6/7.1	6.2/7.2	6.3/7.4	5.1/7.3	4.3/6.5	2.5/4.9	1.4/4.3	4.6/5.7
Latitude +15	Average	3.4	4.4	5.1	5.4	5.5	5.6	5.8	6.1	6.1	5.5	3.9	3.1	5.0
	Min/Max	2.0/5.1	2.8/5.6	3.5/6.1	4.3/6.2	4.6/6.3	4.9/6.1	5.4/6.3	5.7/6.7	4.8/7.1	4.4/6.6	2.6/5.2	1.4/4.6	4.3/5.5
90	Average	3.2	3.9	3.9	3.5	3.0	2.8	2.9	3.6	4.3	4.5	3.5	2.9	3.5
	Min/Max	1.6/4.8	2.4/5.0	2.6/4.7	2.9/4.0	2.6/3.3	2.5/2.9	2.7/3.2	3.3/3.9	3.4/5.0	3.6/5.5	2.2/4.7	1.3/4.4	2.9/3.9

Solar Radiation for 1-Axis Tracking Flat-Plate Collectors with a North-South Axis (kWh/m²/day), Uncertainty ±9%

Axis Tilt (°)		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
0	Average	2.7	4.0	5.6	7.3	8.8	10.0	10.1	9.2	7.6	5.5	3.2	2.3	6.4
	Min/Max	1.7/3.8	2.7/5.0	3.7/6.8	5.9/8.6	6.9/10.5	8.0/11.6	8.8/11.3	8.1/10.6	5.9/9.1	4.2/6.7	2.3/4.1	1.2/3.3	5.4/7.0
Latitude -15	Average	3.4	4.8	6.3	7.7	8.9	10.0	10.2	9.6	8.5	6.5	4.0	3.0	6.9
	Min/Max	2.0/5.1	3.0/6.1	4.1/7.7	6.2/9.2	7.1/10.8	8.0/11.6	8.9/11.4	8.5/11.1	6.4/10.0	4.9/7.9	2.7/5.3	1.4/4.5	5.9/7.6
Latitude	Average	3.7	5.1	6.5	7.7	8.7	9.6	9.8	9.4	8.6	6.8	4.3	3.3	7.0
	Min/Max	2.0/5.6	3.1/6.5	4.1/7.9	6.1/9.1	6.8/10.4	7.7/11.1	8.6/11.1	8.3/10.9	6.3/10.2	5.2/8.4	2.9/5.8	1.5/5.0	5.8/7.6
Latitude +15	Average	3.8	5.2	6.4	7.4	8.2	9.0	9.2	9.0	8.4	6.9	4.5	3.4	6.8
	Min/Max	2.1/5.9	3.1/6.7	4.1/7.9	5.8/8.8	6.4/9.9	7.1/10.4	8.0/10.4	7.9/10.4	6.3/10.0	5.2/8.4	2.9/6.0	1.5/5.3	5.6/7.5

Solar Radiation for 2-Axis Tracking Flat-Plate Collectors (kWh/m²/day), Uncertainty ±9%

Tracker		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
2-Axis	Average	3.9	5.2	6.5	7.8	9.1	10.3	10.4	9.6	8.6	6.9	4.5	3.5	7.2
	Min/Max	2.1/5.9	3.1/6.7	4.2/8.0	6.2/9.2	7.1/10.9	8.2/11.9	9.0/11.7	8.5/11.1	6.5/10.2	5.2/8.5	2.9/6.1	1.5/5.4	6.0/7.9

Direct Beam Solar Radiation for Concentrating Collectors (kWh/m²/day), Uncertainty ±8%

Tracker		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
1-Axis, E-W Horiz Axis	Average	2.0	2.7	3.2	3.7	4.5	5.6	5.8	5.2	4.8	4.1	2.6	1.9	3.8
	Min/Max	0.6/4.0	0.9/4.0	1.6/4.3	2.5/4.8	3.1/5.9	3.8/6.8	4.7/6.8	4.3/6.4	3.4/6.1	2.9/5.3	1.4/3.9	0.3/3.6	3.1/4.4
1-Axis, N-S Horiz Axis	Average	1.4	2.4	3.6	4.8	6.1	7.4	7.6	6.9	5.8	4.1	2.0	1.2	4.5
	Min/Max	0.5/2.8	0.9/3.5	1.7/4.9	3.3/6.2	4.1/8.0	5.0/9.2	6.3/9.1	5.5/8.6	4.1/7.5	2.7/5.4	1.1/3.0	0.2/2.4	3.6/5.1
1-Axis, N-S Tilt=Latitude	Average	2.2	3.3	4.2	5.1	5.9	7.0	7.3	7.1	6.6	5.2	2.9	2.0	4.9
	Min/Max	0.7/4.3	1.1/4.8	2.0/5.8	3.5/6.6	4.0/7.8	4.7/8.7	6.0/8.7	5.7/8.8	4.5/8.5	3.5/6.8	1.6/4.4	0.3/3.8	3.9/5.6
2-Axis	Average	2.3	3.3	4.3	5.2	6.3	7.6	7.9	7.3	6.6	5.3	3.1	2.2	5.1
	Min/Max	0.8/4.6	1.2/4.9	2.0/5.8	3.6/6.7	4.2/8.2	5.1/9.5	6.5/9.4	5.8/9.0	4.6/8.5	3.6/6.9	1.7/4.6	0.4/4.1	4.0/5.9

Average Climatic Conditions

Element	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Year
Temperature (°C)	-2.3	1.2	5.4	9.8	14.9	20.6	25.5	24.7	18.4	11.8	4.9	-1.3	11.1
Daily Minimum Temp	-7.1	-4.1	-0.3	3.3	7.6	13.0	17.6	16.6	10.6	4.6	-0.6	-5.8	4.6
Daily Maximum Temp	2.4	6.4	11.2	16.3	22.2	28.2	33.4	31.9	26.2	18.9	10.4	3.2	17.6
Record Minimum Temp	-30.0	-34.4	-16.7	-10.0	-3.9	1.7	4.4	2.8	-2.8	-8.9	-25.6	-29.4	-34.4
Record Maximum Temp	16.7	20.6	25.6	29.4	33.9	40.0	41.7	40.0	37.8	31.7	23.9	19.4	41.7
HDD, Base 18.3°C	639	481	399	258	119	28	0	0	60	207	403	608	3203
CDD, Base 18.3°C	0	0	0	0	13	97	222	183	63	4	0	0	582
Relative Humidity (%)	74	70	60	53	49	41	36	39	46	56	66	74	55
Wind Speed (m/s)	3.5	3.8	4.3	4.4	4.2	4.2	4.3	4.3	4.2	3.8	3.8	3.4	4.0