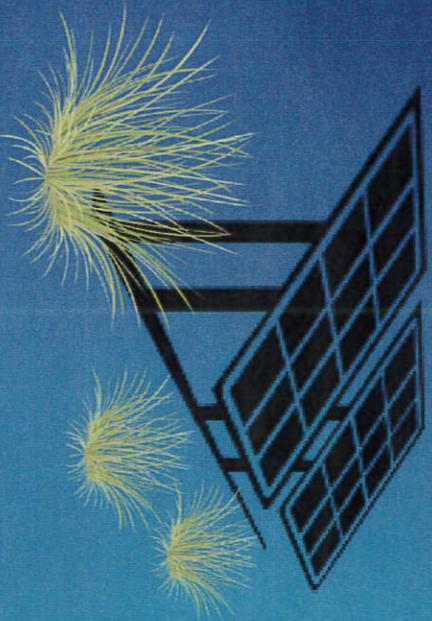


# Fox Solar Farm



30 ACRES

PHOTOVOLTAIC SOLAR ARRAY

CONVERSION OF SUNLIGHT INTO ENERGY

INTERCONNECTED TO EXISTING ELECTRICITY GRID

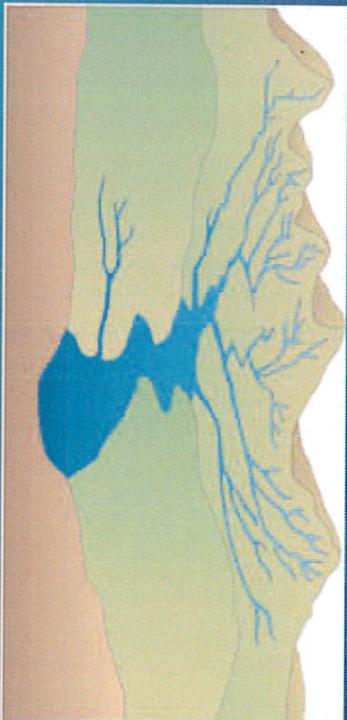
POWER IS UTILIZED LOCALLY



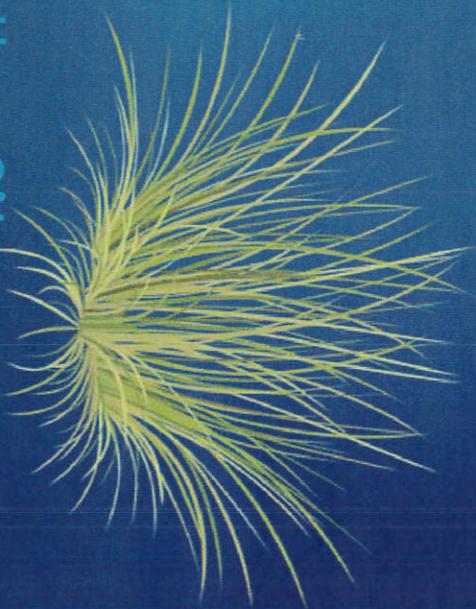
Traffic  
County Services



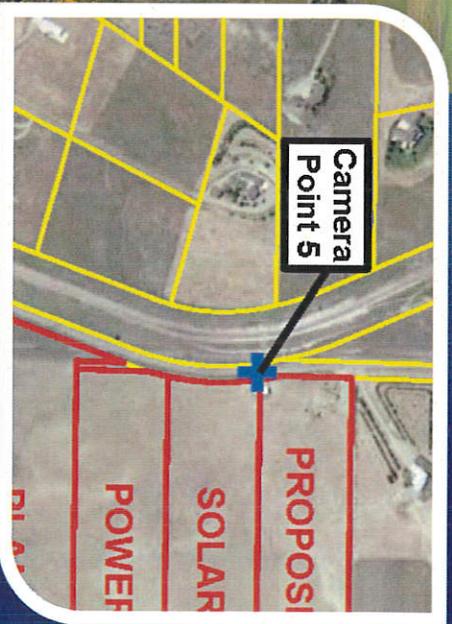
Water  
Soil



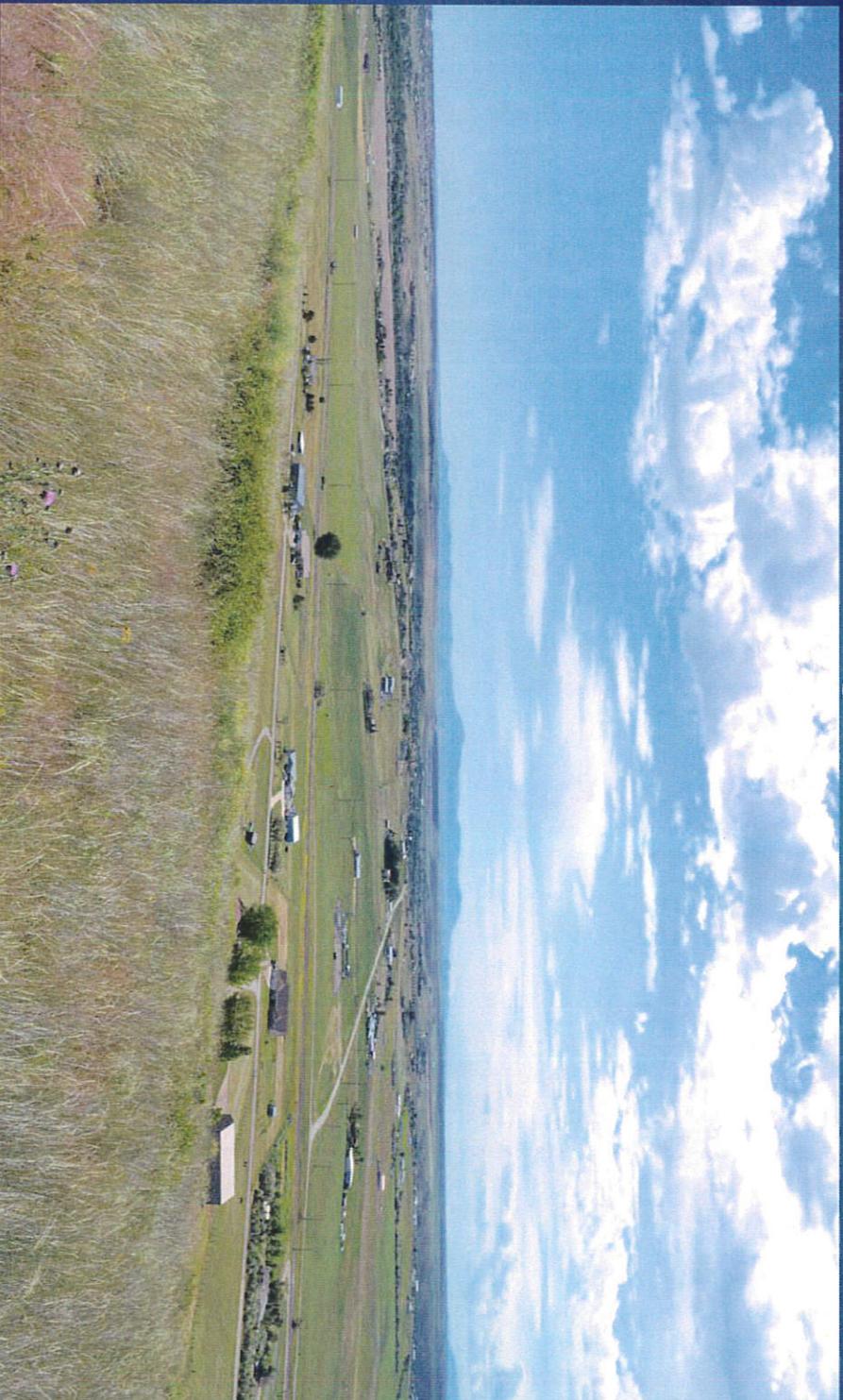
Weed Mitigation  
Maintenance of the Site



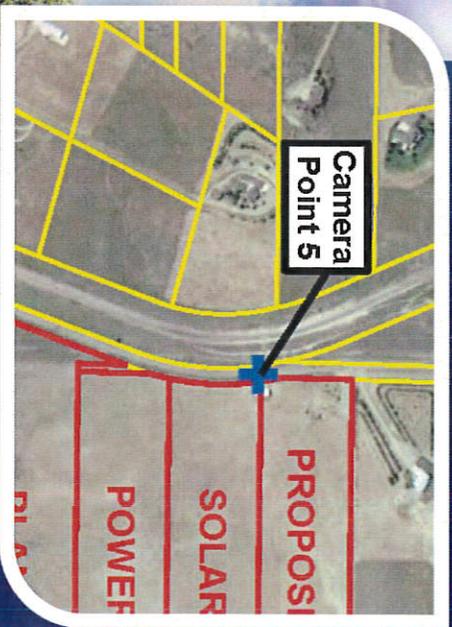
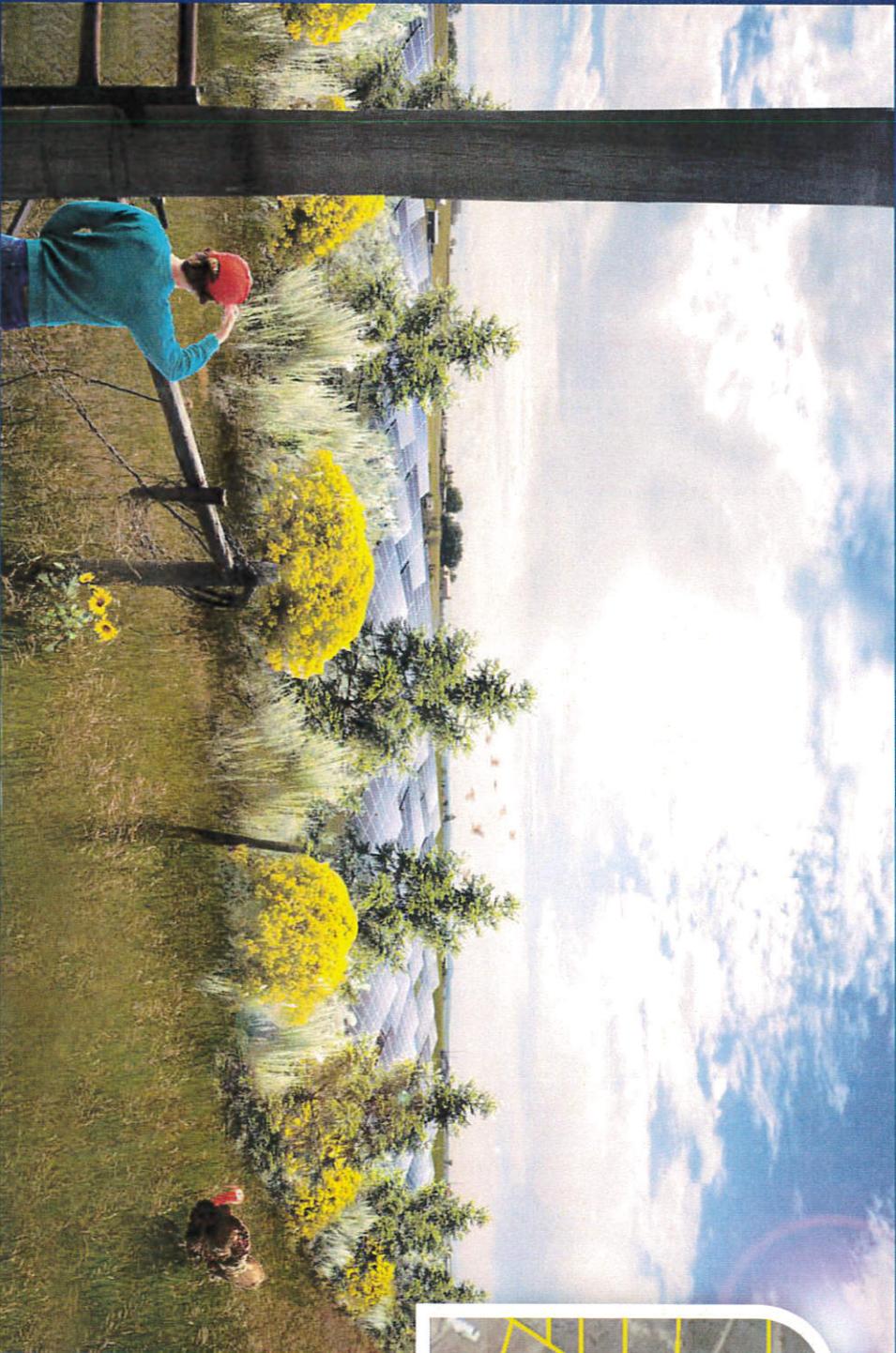
# Fox Proposed Conditions



# Existing Conditions



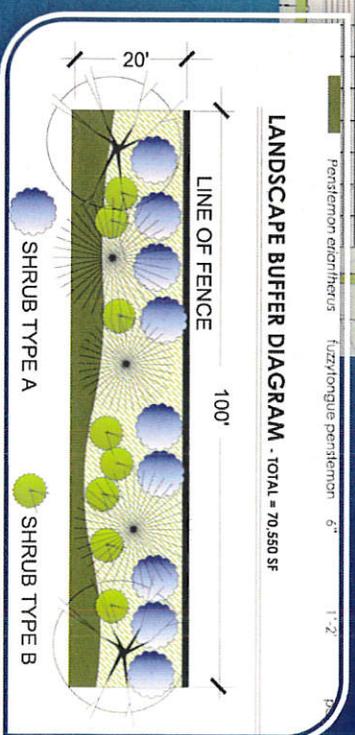
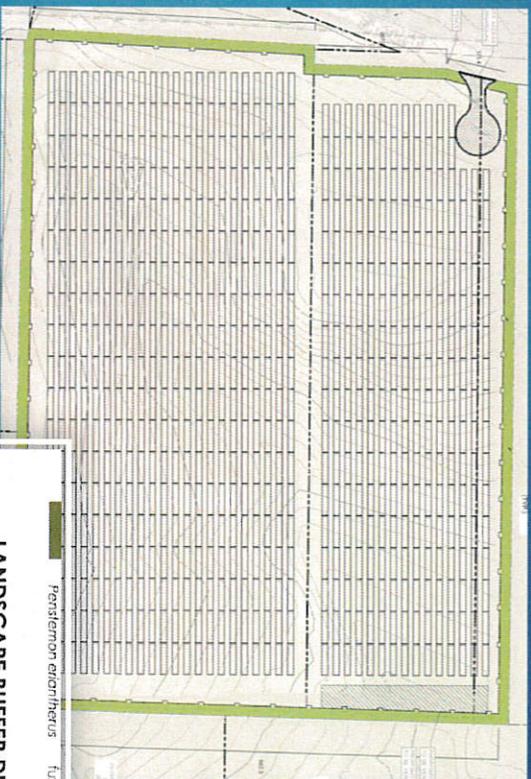
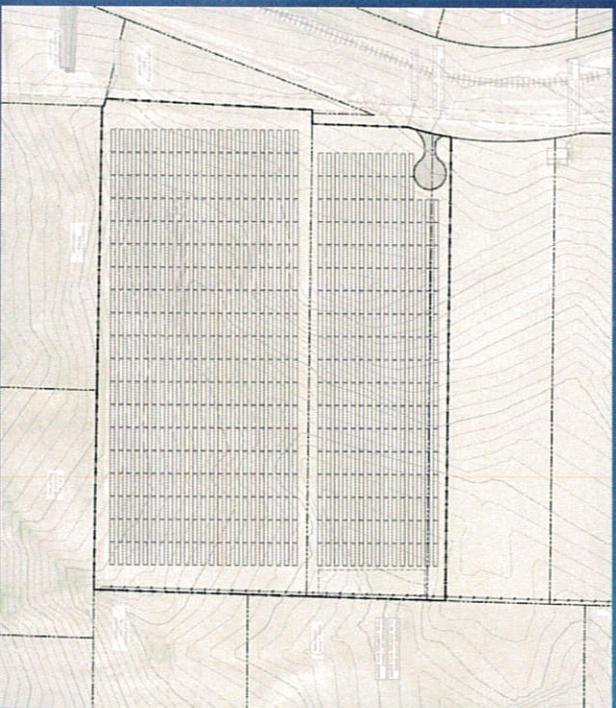
# Fox Proposed Conditions



# Existing Conditions



# Fox Site and Landscaping Plan



# SOLAR PHOTOVOLTAIC TECHNOLOGY

## Common Questions

1. Is heat is created?
2. How big is the solar project?
3. What are the solar panels made with?
4. Do plants grow well in solar arrays?
5. How much light is reflected?
6. How much sound is created?
7. Are their EMF risks?
8. What are the safety risks?
9. How do the economics work?



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# Is Heat Created?

CYPRESS CREEK RENEWABLES EXCLUSIVELY BUILDS PHOTOVOLTAIC SOLAR POWER PLANTS

## **SOLAR PHOTOVOLTAICS**

Sunlight to electricity: Simple, inexpensive, safe.



## **SOLAR THERMAL**

Sunlight to heat: Complicated, expensive, dangerous.



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# How Big is the solar Project?

FOX AND PORTAGE ARE 3 MW SOLAR FARMS COVERING 30 ACRES

**EXAMPLE PROJECT: KIRKWALL**  
5 MW, 40 acres



**COMPARISON: FOX AND PORTAGE**  
3 MW, 30 acres



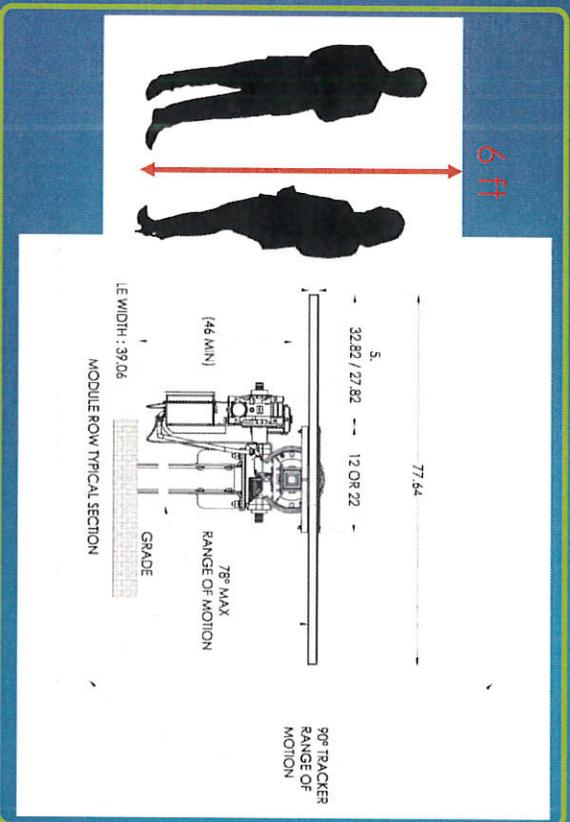
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# How Big is the solar project?

FOX AND PORTAGE USE SINGLE AXIS TRACKERS AND PHOTOVOLTAIC MODULES

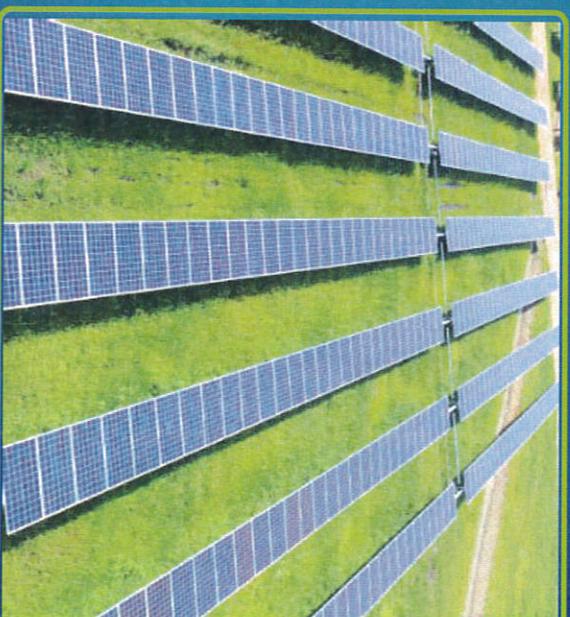
## SINGLE AXIS TRACKING

Height is 6-8 feet at the top



## ROWS ARE 10-12 FEET APART

Covering ~40% of the ground.



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# WHAT ARE THE SOLAR PANELS MADE WITH?

## Non-Toxic, Solid State

### Crystalline Silicon

Most common technology - 90% of all solar panels installed

Silicon is non-toxic - "beach sand"

~~The most abundant element on earth~~

### Copper-Indium-Selenium - CIS

Alternative "thin film" technology

~~Copper, Indium, and Selenium are non-toxic~~

### Aluminum and Glass

Front of module is covered by anti-reflective glass

Edge of module is an aluminum frame

Module circuitry is aluminum

**No fluids, no chemicals, no leaks**

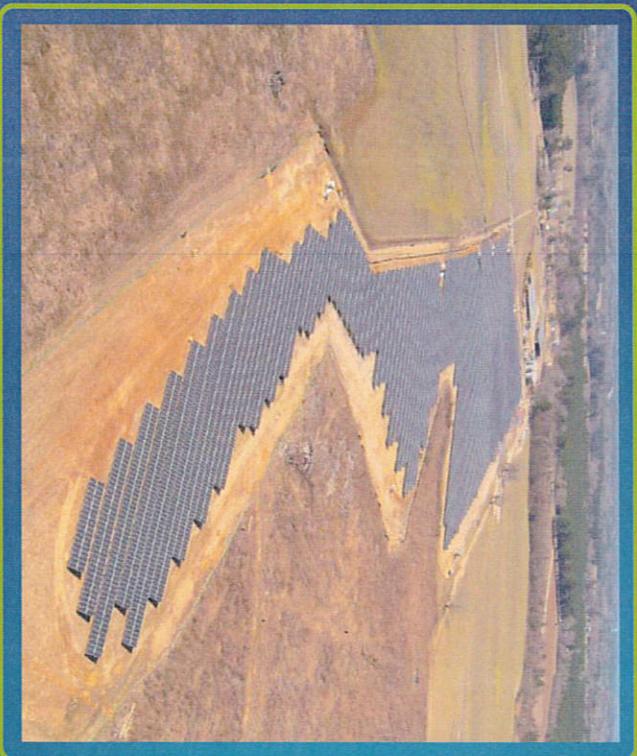
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# Do Plants grow well in Solar Arrays?

RECOVERY IS QUICK. EXAMPLE PROJECT: CB BLADEN (LOCATED IN NC)

CONSTRUCTION FINISHED - FEB 12, 2016



FOUR MONTHS LATER - JUNE 15, 2016

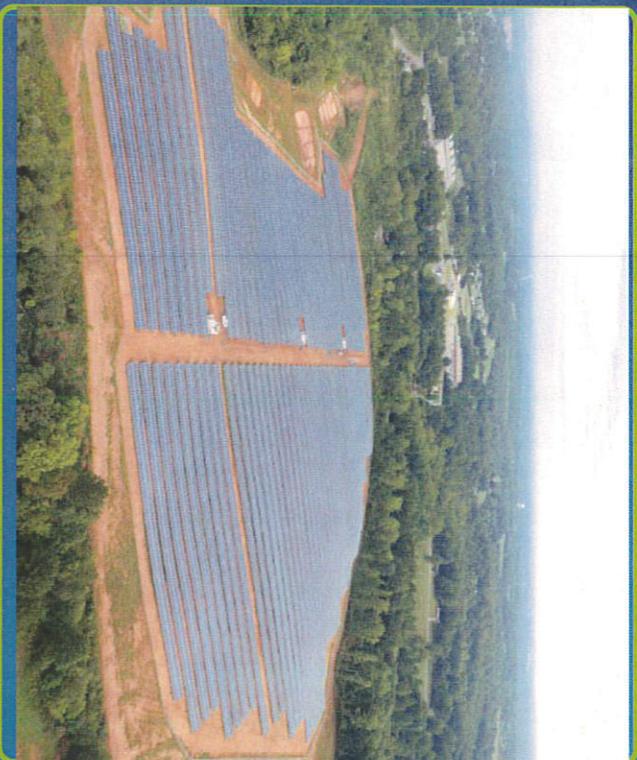


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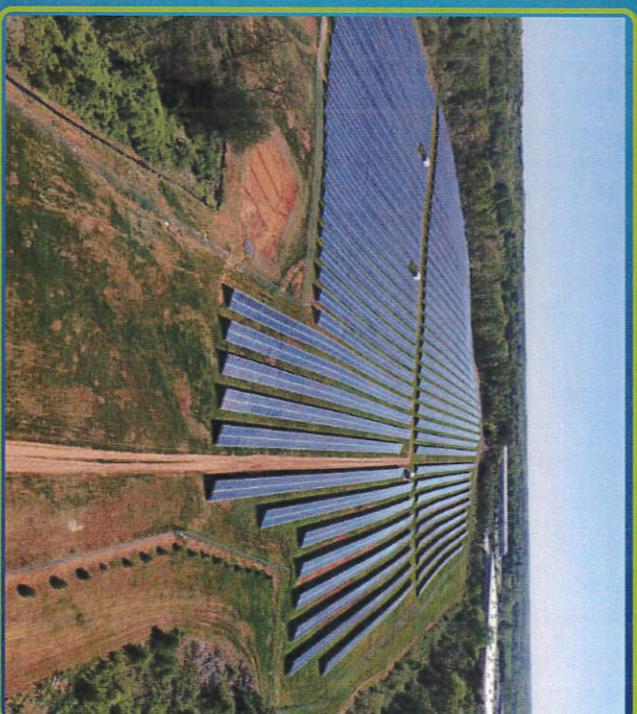
# Vegetation Regrowth

EXAMPLE PROJECT: ANGEL (LOCATED IN NC)

CONSTRUCTION FINISHED - NOV 8, 2015



FIVE MONTHS LATER - APRIL 13, 2016

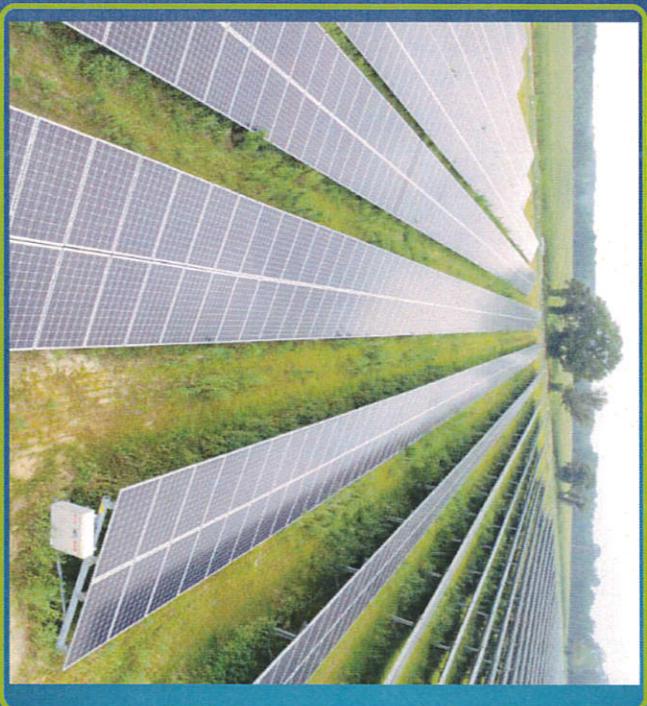


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# Vegetation Regrowth

UP CLOSE VIEWS AFTER FOUR TO FIVE MONTHS

**CB BLADEN**



**ANGEL**



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# HOW MUCH LIGHT IS REFLECTED?

## Minimal Reflected Sunlight

### No Glare

The solar panels are design to absorb as much light as possible

Anti-reflective glass coating

Sun angles and panel angles reflect light towards the sky

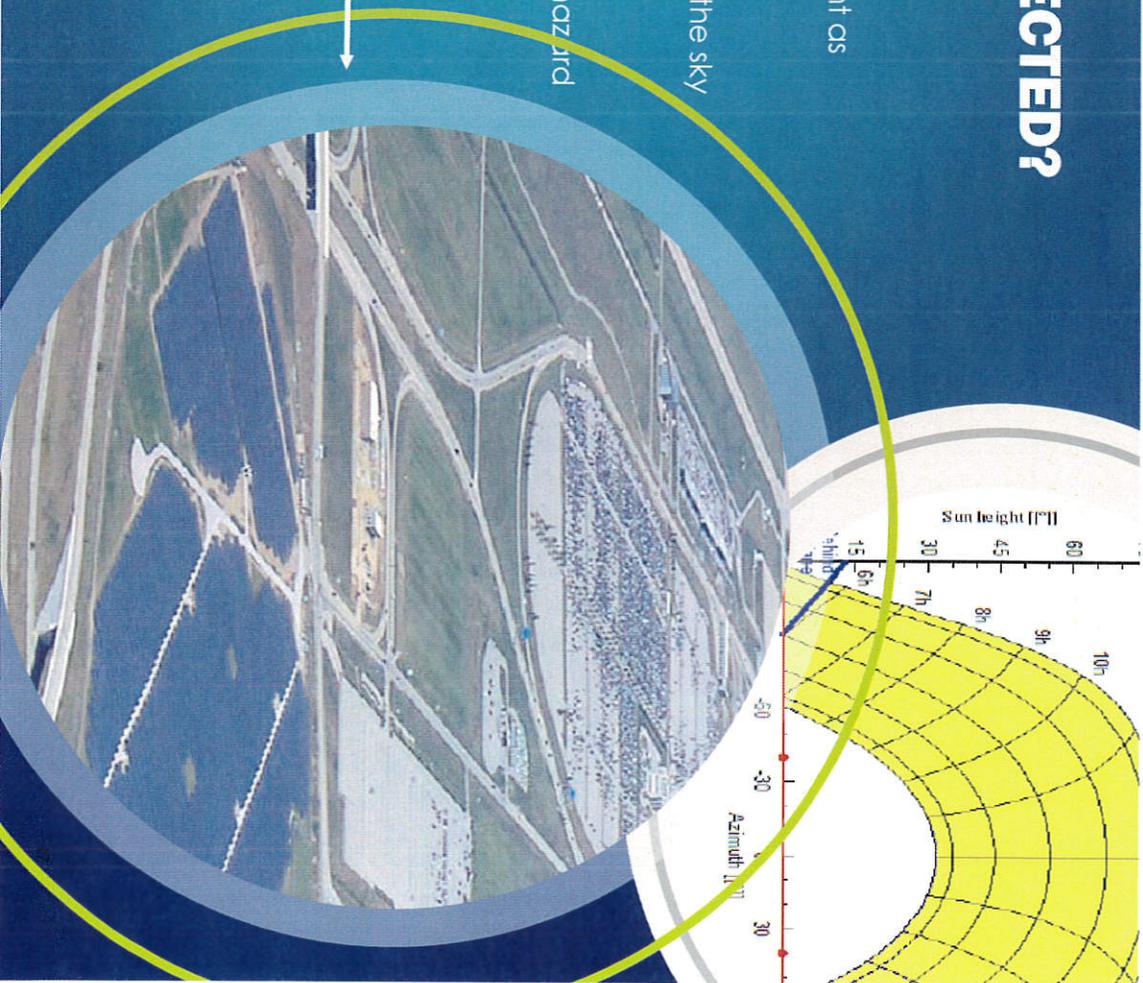
### Safe for Airplanes

Solar arrays require FAA Glare Hazard Studies

Not one solar array has been considered a glare hazard

Some airports have solar arrays in them

Indianapolis Airport

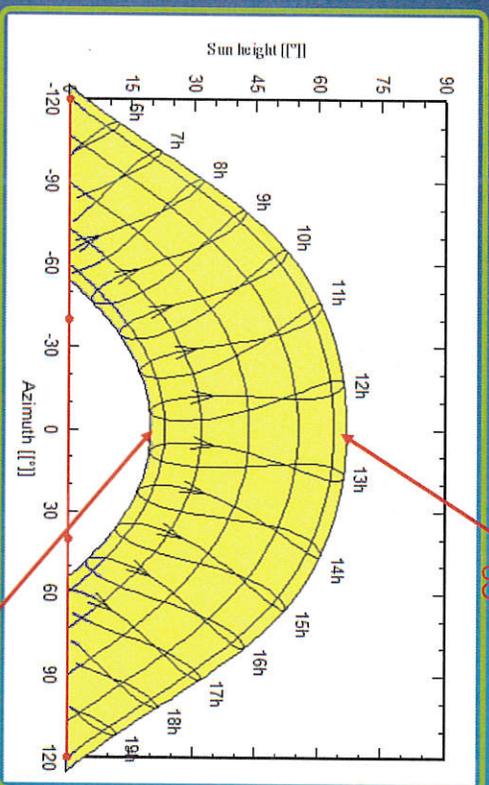


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# How Much Light is Reflected NORTH?

EXAMPLE: FOX SOLAR

## SUN PATH FOR GREAT FALLS, MT



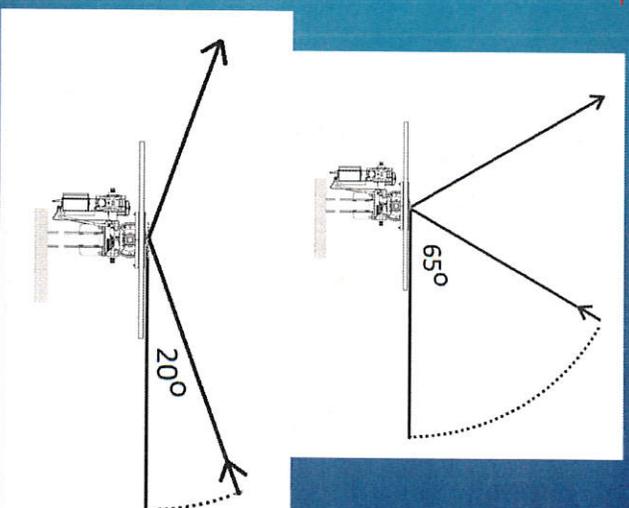
Noon on June 21<sup>st</sup> - 65°

Noon on December 21<sup>st</sup> - 20°

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## SOLAR PANELS AT NOON

Sunlight is reflected North





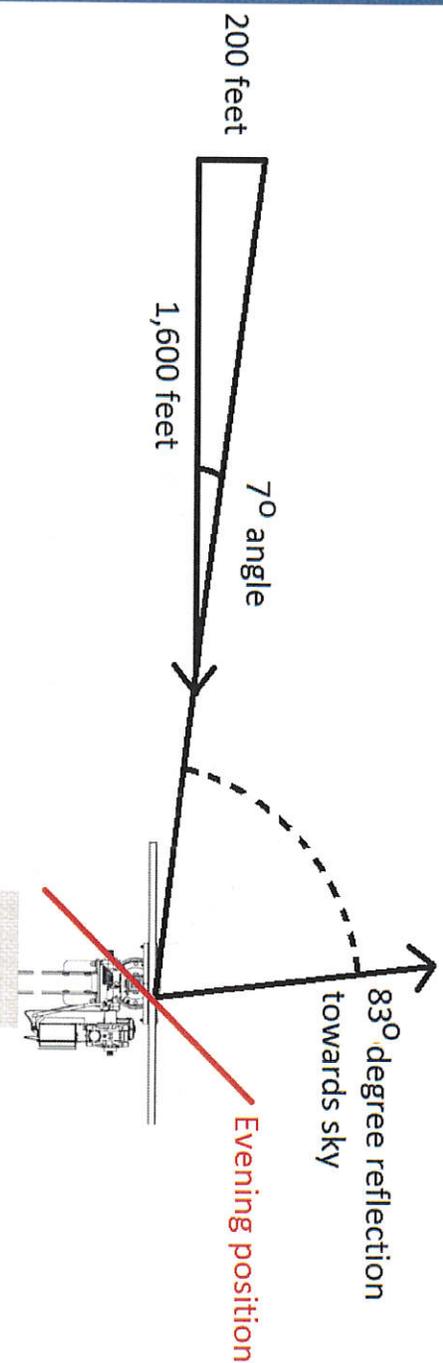


# How Much Light is Reflected WEST?

EXAMPLE: FOX SOLAR

The closest point on the bluff is 1,600 feet away and 200 feet above Fox. This is a 7 degree angle from ground level.

**SOLAR PANELS AT SUNSET**  
Sunlight is reflected West



Due to max tilt angle of the panels, all light reflected in the evenings is towards the sky. It is not possible for light to be reflected towards properties to the West.

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# ARE THERE EMF RISKS?

Weak source of EMFs, even up close.

## Electromagnetic Fields

Everything in nature produces electromagnetic fields. The inverters produce the "strongest" EMFs in the solar farm, but are many times less powerful than normal overhead power lines.

At 150 feet from the inverters, no EMFs can be detected above the Earth's magnetic field. Same as for sound, the inverters are located 500 feet from the edges as an extra buffer.

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# HOW DO THE ECONOMICS WORK?

## Economics of Solar Development

### Weather Record

Historical data of sunlight, temperature, and wind speeds from 1960

### Expected sunlight per year

### Energy Model

Highly accurate solar energy simulations

Expected energy generation per year

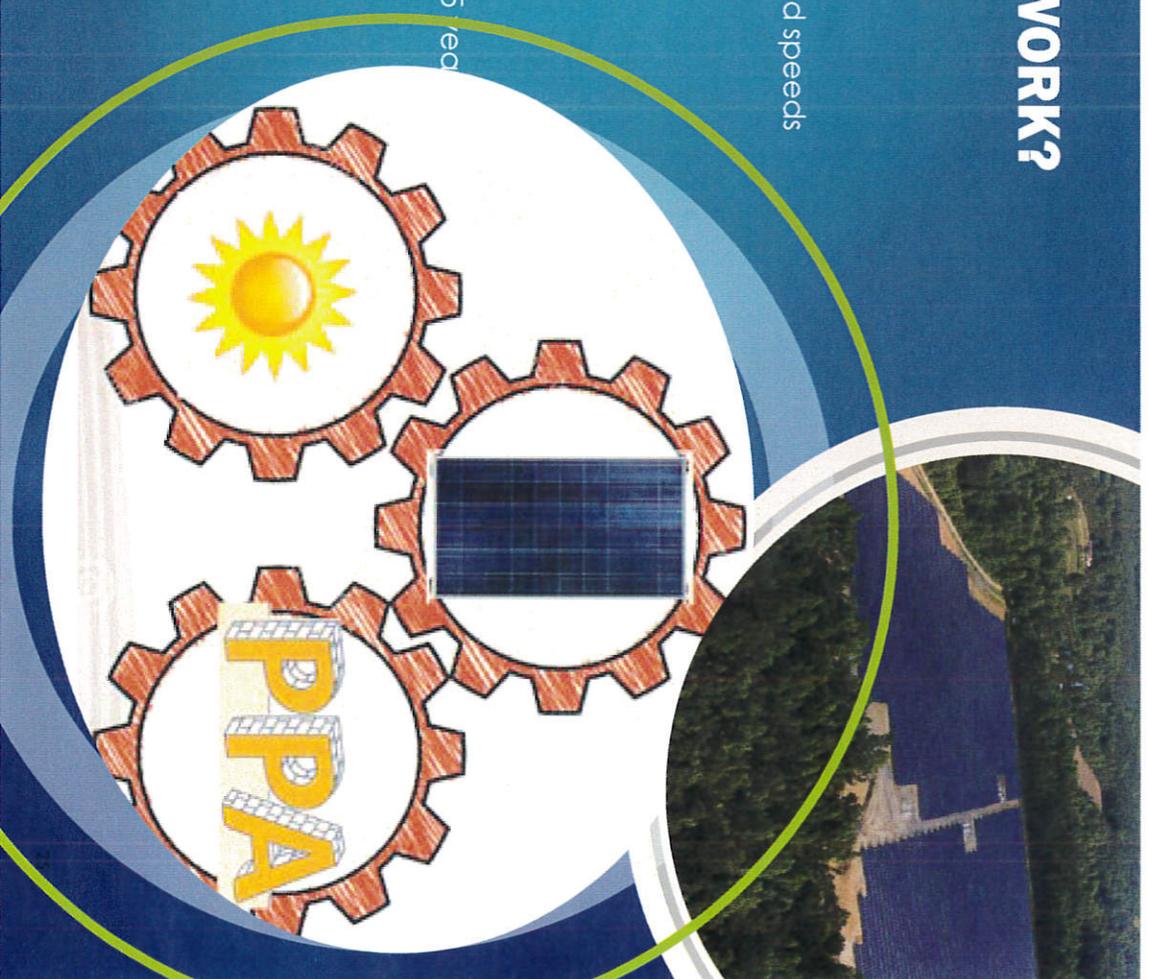
### Power Purchase Agreement

Contract with utility to buy power for 15, 20, or 25 years  
Expected revenue per year

Project revenue over project lifetime exceeds project development, construction, and operations costs

PPA with Northwestern energy for ~6.5 cents/kWh

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# EMPLOYMENT IN THE SOLAR INDUSTRY?

## Employment

### Nationwide

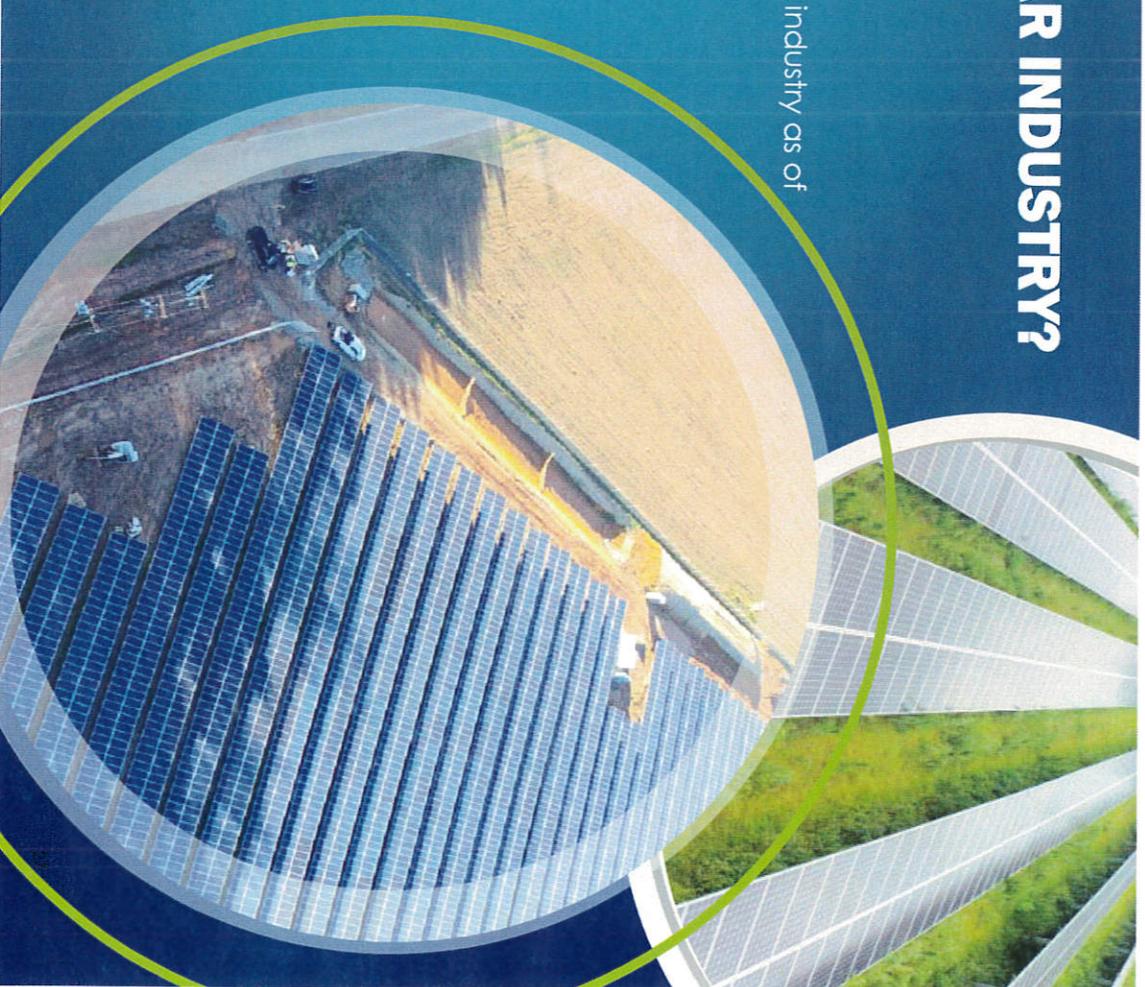
The US employs over 280,000 people in the solar industry as of 2016

### Cypress Creek Renewables

Employs 150 people directly

Employs over 4,000 contractors indirectly

The solar is a growing industry, and was directly responsible for 1 out of 83 new jobs created last year.



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