



RESOLUTION

C O P P E R

Dark Sky Project Plan

DARK SKY

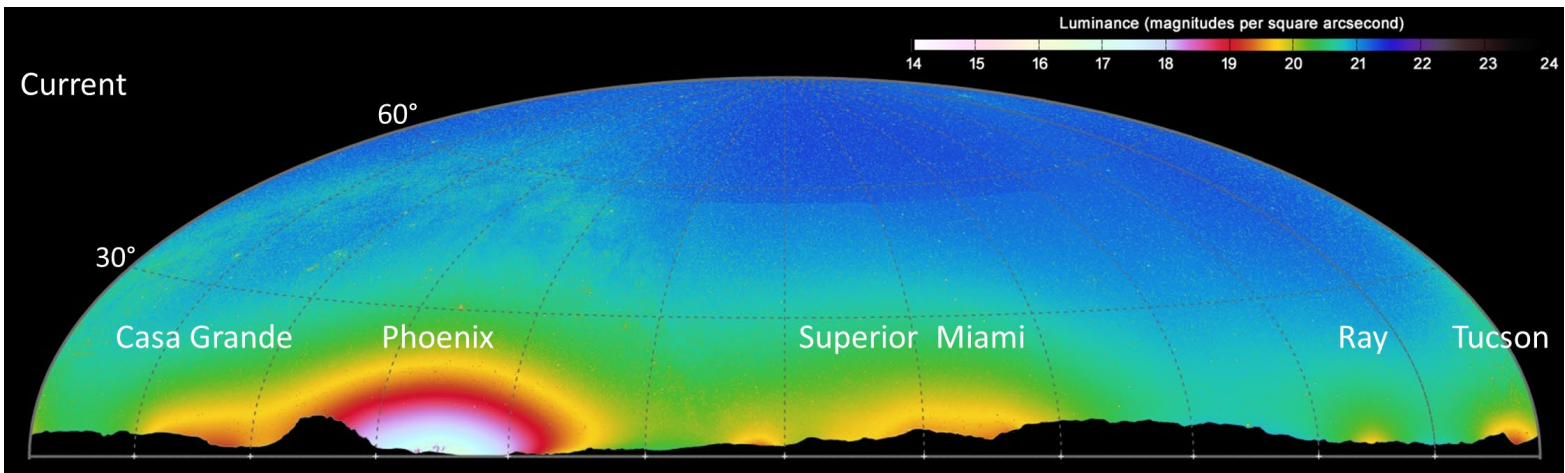
DARK SKY PLAN FOR RESOLUTION COPPER PROJECT

GENERATIONS OF ARIZONANS have gazed into the night sky with awe. Enjoyment of our night skies is often the reason people choose to live in rural areas. Minimizing the impact of light from the proposed operations while maintaining a safe work environment is our goal.

Resolution Copper is proud to join the efforts to protect Arizona's Dark Sky heritage.

Photo: Jack Taylor

CURRENT VISUAL SKY GLOW NEAR SUPERIOR, ARIZONA



THIS IMAGE REPRESENTS the current visual sky glow near Superior, Arizona, based on a mosaic of camera images depicting sky brightness. This sky map shows current sky brightness in the darkest conditions observable--from the southwest outskirts of town, when the moon was below the horizon. The color key indicates the percent brightness increase over natural sky brightness levels. The brightness increases are primarily due to artificial lighting.

The predicted impact of Resolution Copper operations will be a slight increase in sky brightness near Superior and Miami. As a mitigation, Resolution Copper worked with engineering and consulting companies to design lighting for the proposed mining project consistent with the goals of the Pinal County Code, Chapter 2, Outdoor Lighting; the Town of Superior Zoning Ordinance on Outdoor Lighting Provisions (Superior Zoning Ordinance 17-140, Article XV); and, best practice approaches. Resolution Copper will strive to maintain dark skies with minimal impact on the night sky, while balancing safe lighting for work activities.

WHAT IS LIGHT POLLUTION?

THE INCREASE in artificial light without measures to reduce sky brightness at night that impairs the view of the stars and planets above, affecting the natural environment, and increasing energy use.

Components of light pollution:

Glare – excessive brightness that causes visual discomfort

Skyglow – brightening of the night sky over inhabited areas

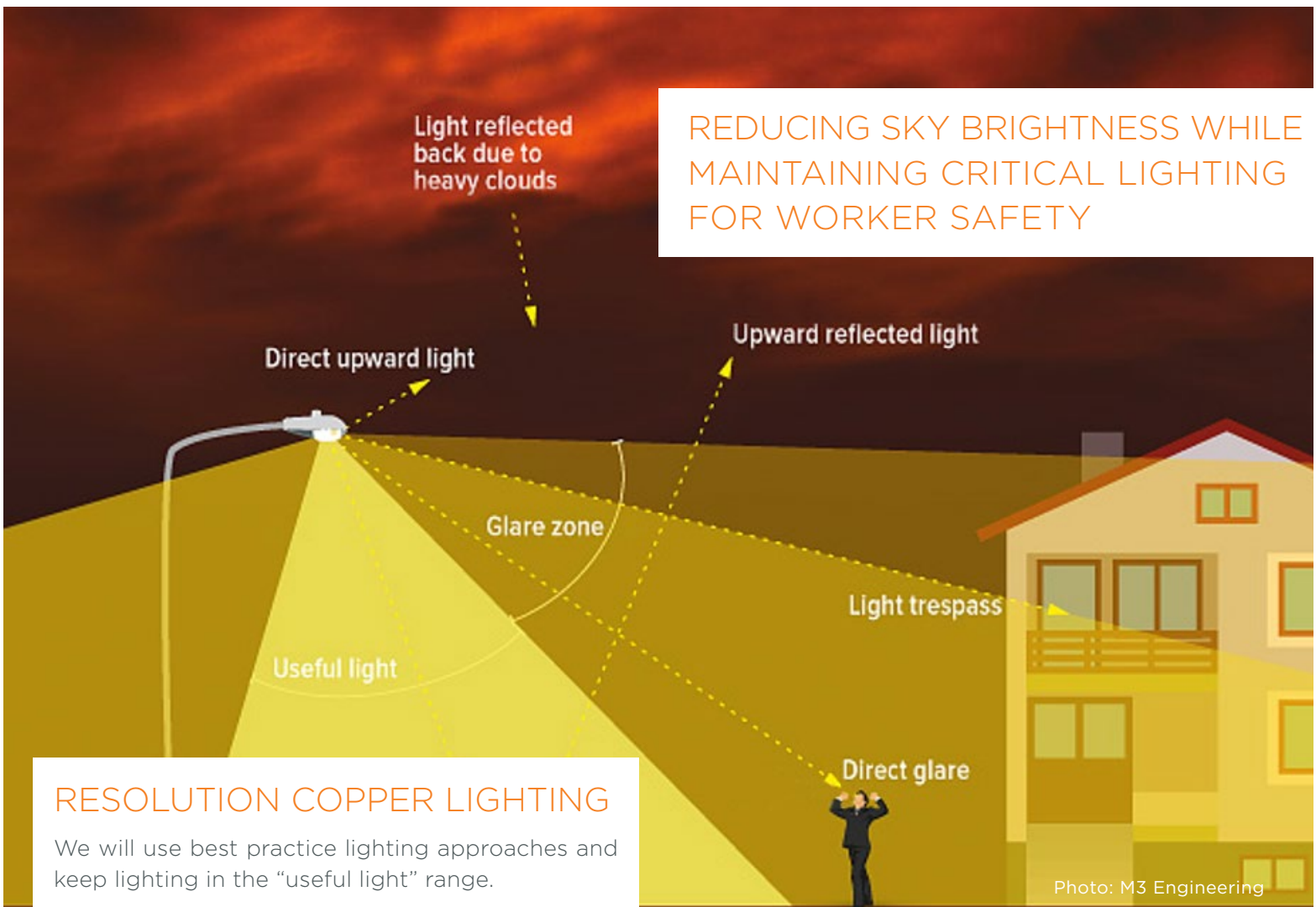
Light trespass – light falling where it is not intended or needed

Clutter – bright, confusing and excessive groupings of light sources



Photo: International Dark Sky Association

REDUCING SKY BRIGHTNESS WHILE MAINTAINING CRITICAL LIGHTING FOR WORKER SAFETY



RESOLUTION COPPER LIGHTING

We will use best practice lighting approaches and keep lighting in the “useful light” range.

Photo above showing nighttime lighting without measures to reduce sky brightness, resulting in glare, sky glow, light trespass, and clutter. International Dark Sky Association

RESOLUTION COPPER MEASURES TO REDUCE SKY BRIGHTNESS AND PRESERVE DARK SKIES

RESOLUTION PLANS to include the following measures to preserve dark skies:

- Minimize lighting along roadways and corridors to specific locations where it is necessary for operational effectiveness and safety (e.g. pump stations and potential pedestrian traffic)
- Replace lighting in non-critical areas with lower-impact lighting such as amber LEDs
- Reduce illumination levels where appropriate and safely possible
- Install lighting with control systems that provide the ability to turn lighting off at particular times of night (e.g. motion activated lighting or timers)
- Direct lighting downward and incorporate shielding as needed.



Photo: Jack Taylor



COLLABORATIVE APPROACH

- Guided by lighting measures in the Pinal County code and Town of Superior zoning ordinance, Resolution's plan to design proper lighting will reduce light pollution, save energy, and reduce impacts on wildlife and ecosystems.
- Lighting design may be updated as technology improves.
- The International Dark Sky Association Fixture Seal of Approval will be considered when selecting lighting that minimizes glare, reduces light trespass and limits light pollution on the night sky.



Photo: Jack Taylor