BrightSourceEnergy

# Ivanpah Solar Electric Generation System (ISEGS)

## Worker Environmental Awareness Program Handbook for Biological, Cultural, and Paleontological Resources

CH2MHILL

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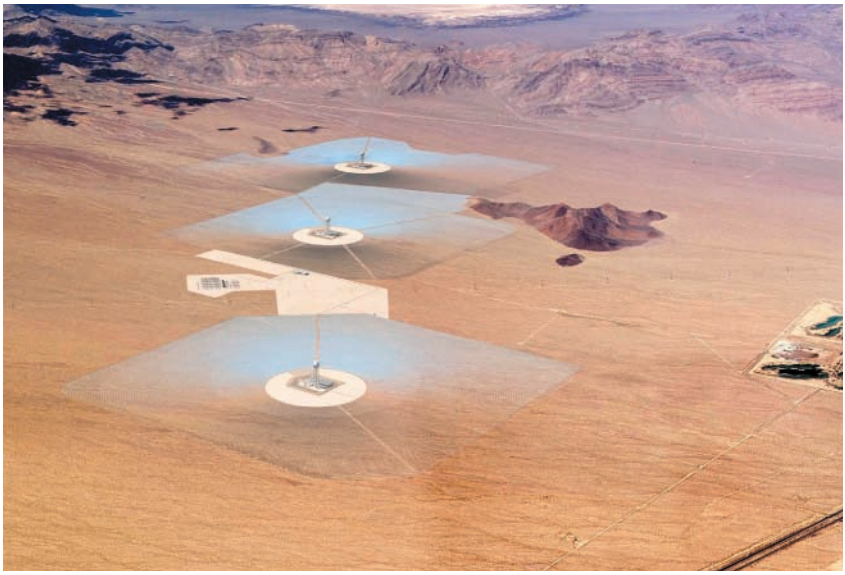


# BSE Commitment

BrightSource Energy (BSE) is committed to protecting sensitive biological resources during construction and operation of the Ivanpah Solar Electric Generation System (ISEGS). This handout includes an overview of the sensitive biological resources that may be encountered during construction and operation and guidelines for protecting these resources. The project's authorized biologist and other biological monitors are a resource to support you with this effort.

Please sign the training acknowledgement form verifying that you received this training and shall abide by the guidelines provided.

***Cooperation and communication are key to success.***
***Always ask before you act.***

# Sensitive Biological Resources

The Ivanpah SEGS project site and vicinity include features that provide habitat for sensitive plants and wildlife. Of particular concern is the desert tortoise.

## Desert Tortoise

The ISEGS project site and vicinity is habitat for the federally and state threatened desert tortoise (*Gopherus agassizii*).
Desert tortoises are known to be present at the project site and vicinity. Any construction activity involving equipment or vehicle movement anywhere in the project site or vicinity is a potential threat to the desert tortoise. **All construction activities, project vehicles, and equipment must stay within the fenced construction areas that biologists have *identified and cleared* of desert tortoises. All work outside of fenced areas requires the presence of an authorized biologist. All work areas are to be confined to the smallest practical area, considering topography, placement of facilities, public health and safety, and other limiting factors. Use previously disturbed areas to the extent feasible.**

## What you should know about Desert Tortoise

The desert tortoise is the largest reptile in the southwestern United States. It is distinguished by a domed shell. Shell color is brownish, with yellow to tan scute centers. Adults can be over one foot long. Juveniles and hatchlings are smaller but resemble adults. Hatchlings can be as small as 1 ½ inches. Tortoise can live to be 50 to 100 years old and take 15 to 20 years to reach sexual maturity.

Although tortoises have existed for millions of years, the number of these animals is declining. The reasons for the drop in numbers includes loss of habitat through urban development, disease, roads, introduction of exotic plants, increased predation by ravens, and collecting as pets.

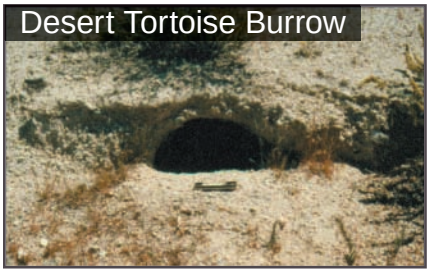
**Legal Protection**

Desert tortoises are protected by the Federal and California Endangered Species Act. Federal and state protection makes it illegal to “take” desert tortoises or destroy habitat without an exemption. Take means to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” If you encounter a desert tortoise DO NOT TOUCH IT – JUST LEAVE IT ALONE! Report the observation immediately to an authorized biologist or desert tortoise monitor.

You can be penalized for damaging tortoise habitat, if it is the result of unauthorized activity. An example is driving off designated roads. Maximum fines are $100,000 for an individual, $200,000 for an organization (include a business/corporation etc.) and up to 1 year in prison.

You and your company are responsible for obeying the law.

**Where Desert Tortoises are Found**
Desert tortoise could be encountered anywhere on the Ivanpah SEGS project. Be particularly watchful on roads. Desert tortoises may be found in burrows up to 30 feet in length. You may walk or drive over a burrow without ever seeing the entrance if you drove off road.




**Tortoise Activity**
Tortoises are most active from mid-February through late June and again during September and October. They may also be active during the summer, but don't range far from their burrows when temperatures are very hot. Tortoises are particularly active during or following rainfall.

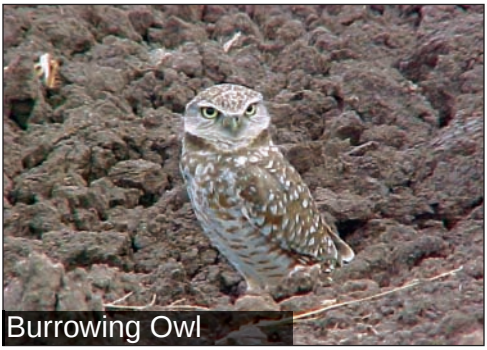
Be aware that tortoises may use parked vehicles and construction equipment for shade during the heat of the day.

Juvenile tortoises may be active throughout the year and at night. Hatchling tortoises are about the size of a silver dollar and may be abundant in the Fall. For this reason, speed limits should be observed in that these small tortoises are hard to see.

## What you must do

- Stay within the fenced construction areas that have been cleared of tortoise and on existing roads. NO CROSS COUNTRY VEHICLE TRAVEL PERMITTED OUTSIDE THE FENCED AREAS WITHOUT THE PRESENCE OF AN AUTHORIZED BIOLOGIST.
- Preconstruction tortoise clearance surveys must be conducted prior to all ground disturbances. Be sure the area has been cleared before starting work.
- Avoid all undisturbed areas and preserve vegetation by staying on designated roads and within the staked project limits.
- Firearms and pets are prohibited while on the job site.

- Remove left-over food and garbage that could provide food for ravens or other predators and place in raven-proof containers. Otherwise, this garbage could attract ravens and other predators that feed on young tortoises.
- Check under/around your vehicle and all equipment before moving it because a tortoise may be using it for shade. If one is observed, the tortoise must be allowed to move away on its own and immediately reported to an authorized biologist or desert tortoise monitor. Only an authorized biologist with a permit for this species can move the tortoise out of the construction area.
- Obey the posted speed limit signs along Colosseum Road and 15 MPH within the project boundary.
- If you encounter a desert tortoise DO NOT TOUCH IT – JUST LEAVE IT ALONE!
- Report any observations of tortoises or incidents involving a desert tortoise immediately to an authorized biologist or desert tortoise monitor.


Burrowing Owl

## Nesting Birds

The ISEGS project site and vicinity supports various nesting opportunities for native raptors (hawks and owls) and songbirds.

**What you should know about Nesting Birds**

Nests may be found in trees, bushes, man-made structures (e.g., electrical towers), or on the ground in burrows (e.g., burrowing owls). Birds generally breed and nest between February 1st and September 1st. Except for a limited few, all birds, nests, eggs, and young are protected under California Fish and Game laws and by the Federal Migratory Bird Treaty Act. An offense is considered criminal and can include substantial fines and possible jail time. Be mindful that not all nests are in trees. Many birds build their nests in human structures and some even make nests on the ground or in burrows, such as burrowing owls.

## What you must do

- Stay out of designated areas that are temporarily off limits due to nesting birds. Work areas will be surveyed for nesting birds prior to and during construction. If an active nest is found, the immediate area will be temporarily off limits.
- If you see nests prior to and during construction, please notify an authorized biologist or biological monitor immediately. Nests may be found in trees, bushes, man-made structures (e.g., storage areas), non-moving equipment, or on the ground in burrows (e.g., burrowing owls).

## Other Wildlife

Other wildlife species are also protected by Federal and State law. These include the Gila monster, snakes, other reptiles, or wildlife. Please report any observations of Gila monsters immediately to the Designated Biologist.

Gila Monster

## What you must do

- All personnel, equipment, and vehicles are to remain inside the identified and cleared work area. Do not enter any area of undisturbed vegetation unless it is inside a fenced and cleared area. If working outside of a fenced area you need to have an authorized biologist or biological monitor present.
- Do not handle, feed, or disturb wildlife. Gila monsters and some snakes are venomous!
- If wildlife is accidentally harmed, immediately notify the authorized biologist or monitor.
- Inform the authorized biologist or monitor about injured, entrapped or dead wildlife observed on site.
- No cross-country travel outside designated and/or fenced areas is authorized. Keep out of designated exclusion areas.
- No fires. Smoke only in posted designated smoking areas. Cigarette butts must be disposed of in the butt containers provided in the designated smoking area.
- Keep fluid spill containment and clean up materials readily available.
- An authorized biologist or desert tortoise monitor will be on site or on call during construction to answer questions regarding desert tortoises and other wildlife.

## Conclusion

Many of the resources found in the project area are protected by state and federal laws. There is the potential for anyone involved with the project to encounter special-status species; particularly desert tortoise and nesting birds. Protect yourself, your supervisor, and your company from legal and financial liability by following the guidelines presented in this brochure.

# Rare Plants at the ISEGS Project Site

**Rusby's Desert Mallow**

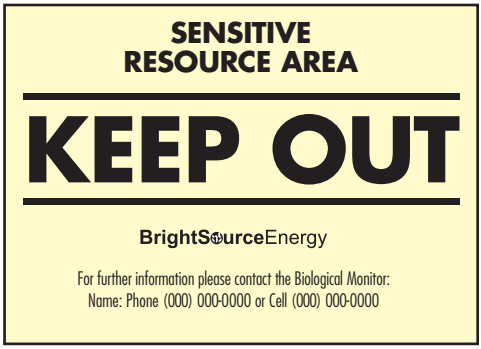
**Mojave Milkweed**

**Desert Pincushion**

**Parish's Club-Cholla**

## Special Status Plant Avoidance and Protection Measures:

- Special Status Plant Avoidance and Protection Area fencing will be installed prior to the commencement of construction. Fencing will be maintained during construction. Restricted areas will be posed with a sign that says to KEEP OUT. (See below).
- Special status plants designated on final project plans as “salvage” will be excavated and transplanted to the Rare Plant Transplantation Area (RPTA). Rare plant salvage will be conducted prior to the commencement of construction.
- No construction activities will occur in Special Status Plant Avoidance and Protection Areas.
- Biological monitors will inspect the Special Status Plant Avoidance and Protection Areas and construction work areas prior to and during construction activities. The Designated Biologist or Environmental Compliance Manager will have the authority to stop work if construction has impacted or will impact a Special Status Plant Avoidance and Protection Area.
- The fencing demarking the Special Status Plant Avoidance and Protection Areas and Rare Plant Mitigation Areas will be maintained in good working operation during the entire construction period.



# Weed Avoidance and Control

Under direction of the Bureau of Land Management, BSE has prepared a comprehensive Weed Control Plan to assure that construction activities, as well as operation of ISEGS, do not promote weed growth in the area, nor lead to the establishment of new weed species in the Ivanpah Valley. Weeds are usually annual plants that prefer disturbed soil conditions, and their seeds commonly hitch-hike on the tires and undercarriage of heavy equipment as well as cars and trucks. They can have devastating effects to local ecosystems because a heavy growth of weeds promotes wildfires in vegetation not adapted to fire. Such a catastrophe could seriously affect the facility, and the surrounding native vegetation may never return after such a fire. Weeds can also poison cattle, and even lead to the local extinction of native plant species. Therefore, for the safety of the facility as well as the health of the surrounding ecosystem, BSE has adopted strict weed control measures that you are required to follow.

These include the following:

- **Vehicle and Equipment Inspection**
  You will be required to stop at an inspection station immediately after you exit I 15 to get to the work site. **If your truck or car is not clean you will be turned around.** You will have to get it washed (including the undercarriage) before you are allowed to drive onto the work site. This also applies to heavy equipment **including** equipment carried on low-boys. The only exceptions will be for water and fuel trucks, and for delivery trucks, that do not leave the pavement off site.
- **Biological Monitors**
  Biological monitors will be present throughout the site. They have the authority to send any vehicle, piece of equipment, or individual off site to be cleaned if they appear to harbor weed-seed. Personal clothing that comes dirty from another site will not be allowed onto the ISEGS site. This also applies to all hand tools that have not been well-cleaned.

- **Exclusion Areas**
  Biological monitors may identify areas where weeds appear to be taking over and, if so they will be cordoned off for weed management measures that may include the application of herbicides. You must not enter these marked exclusion zones.

- **Limiting Disturbance**
  Because weeds thrive on recently disturbed soils, the areas subject to construction disturbance will be kept as small as possible and still allow room for efficient work activities. **No extra work spaces, overland short-cuts, or turn-outs will be allowed without the explicit approval of your construction supervisor and their inclusion in construction plans.**

**Sahara mustard, a weed from North Africa, choking out native desert vegetation.**

# Designated Biologist and Biological Monitors

The ISEGS Designated Biologist is responsible for implementing the project's Biological Resources Management and Implementation Plan (BRMIMP) and providing direct assistance in avoiding impacts to natural resources. **The Designated Biologist has the authority to stop work if activities do not comply with protection measures outlined in the project's BRMIMP.**

## Duties of the Designated Biologist:

- Advise Site Superintendent or Construction Manager on the implementation of the biological resources Conditions of Certification.
- Prepare and supervise the implementation of this WEAP.
- Supervise or conduct monitoring, and other biological resource compliance efforts, including implementation of protection measures.
- Consult with natural resource agencies on potential biological issues and remedial actions.
- Advise project construction workers if there are changes in the environmental protection plans.
- Notify BrightSource Energy and the California Energy Commission (CEC) Compliance Project Manager of non-compliance with any condition and the corrective actions taken, and advise the construction and operations manager when to stop and resume construction in sensitive areas.
- Maintain written records for inclusion in Monthly Compliance Reports.
- Submit monthly and annual compliance reports to the CEC.
- Supervise and support the efforts of the Biological Monitor.
- Coordinate with wildlife agencies for compliance of protection measures.

The Biological Monitors will be on-site during earthwork activities and will clear areas before any and all surface disturbance begins. **The Biological Monitors have the authority to stop work if any violation of mitigation measures occurs in the project area.** Mitigation measures for the project are described in the BRMIMP, available for review from the Compliance Manager.

## Duties of the Biological Monitor:

- Supervise construction in sensitive habitat areas to monitor compliance with mitigation measures.
- Advise BrightSource Energy on how best to avoid adverse impacts to biological resources.
- Assist the Site Superintendent in preparing construction zone limits in sensitive habitats—including flagging and signage.
- Immediately notify the Designated Biologist, BrightSource Energy, and the Environmental Compliance Manager of non-compliance and the corrective actions taken, and advise the construction and operations engineer when to resume construction.
- Notify onsite personnel if there are any changes in the plan.
- Submit monthly and annual reports to the CEC that document implementation of the Conditions of Certification.

## Your Responsibility

- All personnel, equipment, and vehicles are to remain inside fenced areas unless accompanied by an authorized biologist or biological monitor.
- If wildlife is accidentally harmed, immediately notify an authorized biologist or biological monitor.
- Do not handle wildlife.
- Do not feed or disturb wildlife.
- Notify a biologist or the ECM if you observe any of the following:

  - Any injured, wounded, or dead animal

  - Any animal impacting work activity (in harm's way and needs moving)

  - Any breach or tear in tortoise fencing

  - Any breach or tear in fencing surrounding protected rare plant areas

  - A desert tortoise, snake, Gila monster, burrowing owl, nesting birds, raptors or ravens foraging onsite or nesting onsite, coyotes or other large mammal such as a badger.

***Remember: The Designated Biologist and Monitors have the authority to stop work if construction activities are non-compliant.***

# General Work Practices

- Stay in approved work areas (construction zone limits).
- Use only approved access roads.
- Keep out of designated exclusion areas.
- Inspect open trenches for wildlife each morning before starting work.
- Do not litter.
- No pets, firearms or hunting allowed on the project site or in the project area.
- No fires.
- Smoke only in posted and designated areas. Cigarette butts must be disposed of in the butt containers provided.
- Do not feed or disturb wildlife.
- Clean up and report all hazardous material spills immediately.
- Do not discharge water into unapproved areas.
- Protect waterways and storm drains by implementing protective measures, such as silt fencing.
- Report wildlife observations to the Biological Monitor or Designated Biologist.
- Report trapped, injured, or dead wildlife to the Biological Monitor and record the specifics on a Wildlife Observation Form. Forms are available in the Compliance Manager's office and Safety Orientation office.
- Keep fluid spill containment and clean up materials readily available.
- Equipment and vehicle fueling must occur either within a designated refueling area or must use accepted spill protection and be in compliance with the Spill Protection, Control and Countermeasures Plan (SPCC).

***Remember: Always ask before you act.***

# Environmental Laws, Regulations, and Penalties

Many of the resources found in the project area are protected by state and federal laws.

**Federal Endangered Species Act:** Provides protection for federal-listed threatened and endangered plant and animal species. It also prohibits the destruction of habitat critical to their recovery.

**California Endangered Species Act:** Similar to the federal act, it prohibits the take of state-listed endangered and threatened wildlife.

**Migratory Bird Treaty Act:** Prohibits the take of migratory birds. "Take" is defined as to pursue, hunt, take, kill, capture, or harass. This includes eggs, nests, and feathers of any bird, which are fully protected.

**California Fish and Game Code:** Prohibits take of protected plants and animals in California, and protects areas designated as significant habitat.

**The Clean Water Act:** Oversees protection of jurisdictional wetlands and waterways.

The following agencies have regulatory authority in the area and will also monitor construction activities. They could be on site at any time:

- Bureau of Land Management
- County Officials
- California Energy Commission
- California Department of Fish and Game
- U.S. Fish and Wildlife Service
- U.S. Environmental Protection Agency

***Stay out of exclusion zones. They protect sensitive habitats.***

***Violation of state and/or federal environmental laws can result in penalties including fines as high as $100,000 and/or up to one year in jail.***

***Violations can involve corporate and individual penalties.***

***Violations can result in stop work orders and construction delays.***

# Environmental Impacts and Mitigation Measures

**Minimizing construction impacts:**

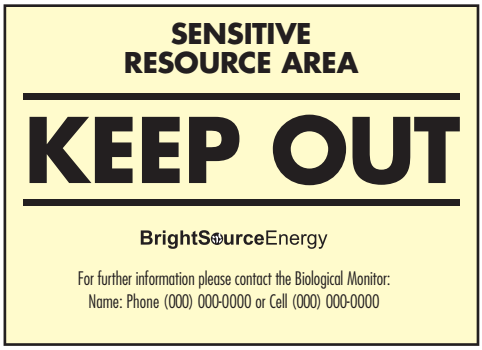
- Open trenches must have escape ramps so animals such as frogs, snakes, and squirrels won't get trapped.
- Minimize the need for restoration by minimizing disturbance.
- Avoid the possible disturbance of nesting birds by staying 500 feet away. Have the Biological Monitor clear the area before you begin any and all work.
- Project construction boundaries are positioned to protect wetlands and sensitive biological resources, and must not be crossed at any time.

**Minimizing operation impacts:**

- Stormwater runoff must not contain hazardous waste, debris, or sediment that could affect biological resources.

**Mitigation Measures as Conditions of Certification:**

- Biological Monitors must be on site or on call during construction.
- Construction exclusion zones must be clearly marked to protect sensitive habitats. Cyclone, silt, and orange fencing with Keep Out signs mark your access boundaries—be aware of your limits.
- Preconstruction surveys must be conducted by the Biological Monitor prior to all ground disturbance.
- Erosion control and revegetation will be implemented for the project according to approved plans.
- Impacts to biological resources will be monitored and reported to the appropriate agencies.



# Cultural Resources

Any trace of past human activity greater than 50 years old may be an important cultural resource. Places or sites where these traces occur are a part of a proud heritage that belongs to all of us. In the general vicinity of the project area, there are archaeological remains that represent over 11,000 years of Native American prehistory and continue until 1769, when Spanish settlement occurred in California. Historical archaeological features, deposits, and architectural structural resources may also be found in the area. Significant cultural resources represent historical events, engineering achievements, and art or architecture styles that define what Americans have experienced. Ethnographic resources are also cultural resources and they may include traditional plant gathering areas, shrines and ceremonial areas, cemeteries, natural landscape features, and ethnic structures or districts. Because these achievements define what we are and affect what we become, the past belongs to us all and we all have a responsibility to help preserve significant cultural resources.

Archaeological and historical sites are a non-renewable resource. Though we are always creating new cultural resources for people of the future to interpret or preserve for posterity, historical and archaeological sites, once destroyed, cannot be recreated.

Archaeological remains are often so fragmentary that it is possible to scrape, dig, or bulldoze right through a buried site without realizing it. Here's what to look for:

- Discolored soil, particularly gray-black soil with a "greasy" feel to it, in an area of lighter colored soils.
- Any animal or human bone. The proper treatment of Native American graves is of great concern. Possession of artifacts or human remains from a Native American grave is a felony (PRC 5097.99).
- A thin layer, or series of layers, particularly dark layers containing charcoal or ash, in an excavation side wall.
- Shell, freshwater or marine, or shell artifacts
- Any unusual concentration of rocks, particularly if they seem to form a pattern (such as a campfire).
- A concentration of small pieces of broken rock, particularly obsidian or chert with sharp edges.
- A concentration of historic-era trash, including bottles, broken glass, broken ceramic, bone, and metal pieces.
- A concentration of brick, concrete, or mortared stone that might indicate a structural foundation.

# Cultural Resources Monitors

A Cultural Resources Monitor may be called upon during the course of construction to observe construction activities. It is the monitor's job to evaluate any cultural resources discovered during construction activities, and to stop work on the project if any important cultural resources are discovered.

The kinds of cultural resources that may be discovered at the site include prehistoric artifacts such as grinding stones, arrowheads, and stone flakes, and historic artifacts such as glass bottles, metal objects, animal bones and building foundations. Human skeletons may also be exposed.

## Examples of Cultural Resources

The following are examples of cultural resources that could be uncovered in the project area. The first seven examples are all stone tools shaped for specific functions.

The first example is a small **hammer stone**. Hammer stones were used for a wide range of tasks and may show wear at one or both ends.

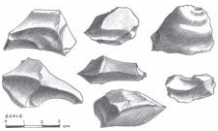
**Hammer Stone**

**Flaked Cobble**

**Flaked cobbles** were used for scraping, digging, or cutting. They can occur in a variety of shapes and sizes with a smooth end for holding.

**Scrapers** had a variety of uses including preparing animal skins, shaping wood, or preparing food. Depending on their function, scrapers come in many shapes and sizes.

**Scraper**



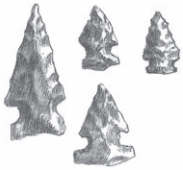
**Lithic Debitage**

Lithic debitage is the waste material produced during the manufacture of flaked stone tools such as knives and projectile points. Debitage may be found in a variety of shapes and sizes, often as a concentration of small flakes of stone.

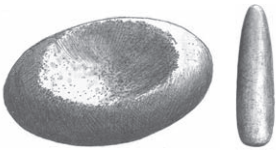
**Flaked Knives**

**Flaked knives** are very distinctive and easily identified by shape and flaking pattern. Flaked knives can be found in a large number of shapes and sizes.

**Projectile Points** are also very distinctive, and are commonly referred to as arrowheads. Projectile points can range in size from one to six inches long and several inches wide.



**Arrowheads**

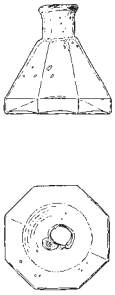


**Mortar and Pestle**

The **Mortar** and **Pestle** were used together as a grinding tool. They were used to prepare foods, pigments, medicines, and potions.

Historic artifacts that may be present include glass bottles, bone, ceramics, metal cans and other metal objects, including wire, nails, and building hardware, as well as the remains of former building foundations and underground utilities.

**Medicine Bottle**



**Glass Ink Bottle**

*Clear glass octagonal ink bottle early 20th century*

**Glass Milk Bottle**

*One quart milk bottle Hester Dairy, San Jose, CA circa 1935*

# Your Responsibility

**If a Cultural Resources Monitor is present when a cultural resource is exposed, he or she will direct you to stop work at the location of the "find."** The ISEGS's Cultural Resource Specialist, Alternate Cultural Resource Specialist, and Cultural Resource Monitors have the authority to halt construction in the area of a discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS. Stopping construction in the vicinity of an archaeological find is an important condition of the project's permit from the California Energy Commission and one with which we expect you to comply. Work may be stopped or redirected for only a few minutes, or it may be shut down for an extended period of time, depending on what is found.

**If a Cultural Resources Monitor is not present when a cultural resource is found, it is your responsibility to stop work and notify your supervisor, and the Cultural Resource Specialist or Cultural Resource Monitor.** Work shall not resume until the construction supervisor and the CRS determine how to redirect the halted work.

It is illegal for you to collect any objects, including old bottles, from public land according to the California Public Resources Code (sections 5097.5 and 5097.9). Disturbing Native American burial sites is a felony under California Public Resources Code Section 5097.99. In addition, the deliberate destruction and removal of cultural resources on private land is prohibited under the conditions of ISEGS's permit from the CEC. The following state and Federal laws and regulations affect the management of cultural resources:

- Archaeological Resources Protection Act
- National Historic Preservation Act
- California Environmental Quality Act
- California Public Resources Code (Sections 5097.5, 5097.9, and 5097.99)

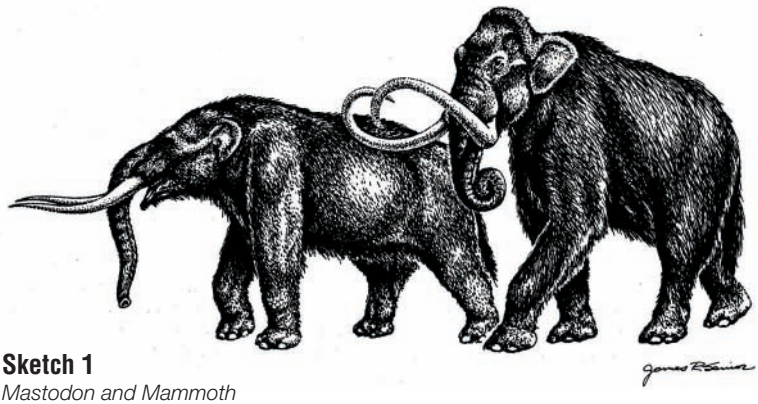
Violations of these regulations can result in federal indictment, and are punishable by civil and criminal penalties, including both fines and/or imprisonment, and could result in the revocation of project certifications, and shut-down of the project at the direction of the appropriate state agency.

Only authorized personnel may handle cultural resources. Notify the Cultural Resources Monitor or Site Superintendent if you think you may have found a cultural resource. Do <u>not</u> touch or move the object.

If you have any questions about these procedures, please ask your Site Superintendent or Cultural Resources Monitor for more information.

# Paleontological Resources

Paleontological resources are fossils; the remains or traces of ancient plants and animals. The past 150 years of scientific fossil collecting in California has resulted in an elaborate record of past life in the State. The first fossils were found during the Gold Rush, and since then scientists have studied the remains of giant reptiles that swam the ocean that once covered California, extinct trees now restricted to Southeast Asia, and the remains of now vanished animals including sabertooth cats, the American lion, ground sloths, camels, mammoth and mastodons (Sketch 1). Fossils also include the remains of plants and animals that still occur in the region such as waterfowl, amphibians, and reptiles such as snakes and lizards. In older sediments, the remains of marine animals can be found including the bones of whales and seals, and the teeth of giant sharks.



**Sketch 1**
*Mastodon and Mammoth*

Since fossils include the remains of animals and plants now extinct, and often represent ecosystems that no longer occur in the region, they are considered non-renewable resources. They are valuable for not only scientific purposes, but also for education. If they are destroyed, or collected by non-scientists, the evidence that these remains provide about past life, including the evolution of these organisms, the ancient ecosystems, and even climate change is lost forever. Fossils are protected by both Federal and State laws and regulations to ensure that they will be available for future generations to study and learn from. For this project, the CEC has mandated that all scientifically significant fossils be salvaged and preserved.

Because fossils may be encountered during excavations, this project includes a paleontological resources protection program managed by a designated Paleontological Resources Specialist (PRS). If a potential fossil is discovered, the PRS will evaluate it to determine whether or not it is a scientifically fossil. **The PRS will have the authority to stop or redirect work in the immediate vicinity of a significant find until the fossils are properly recorded and recovered.**

## Examples of Paleontological Resources

Should significant fossil be encountered, they are likely to be the remains of large mammals that occurred in the Mojave Desert during the Ice Age. Some examples of fossils that may be found on the project site include the teeth and bones of extinct horses and camels, and of mammoths. Remember that they look much less obvious when they are covered with dirt, so be on the lookout for things that look strange, or that look like they might be a bone, or a log, or even sea shells.

**Specimen 1**
*A tooth of the extinct North American horse, about 30,000 years old*

**Specimen 2**
*An elephant rib, which is essentially what a mammoth rib would look like*

**Specimen 3**
*A vertebra of the giant extinct tapir*

**Specimen 4**
*A petrified wood specimen*

# Your Responsibility

BrightSource Energy is committed to the protection of fossil resources. **Remember: it is your duty to help with this protection effort.** If you think you have found a fossil, ***stop work in the immediate area of the find*** and ask your Site Superintendent to notify the Environmental Compliance Manager and/or the Paleontological Resources Specialist so that your "find" can be evaluated as quickly as possible. In the meantime, make sure that the immediate vicinity of the find is staked off for construction avoidance son that others may know to avoid the area.

The following state and federal laws and regulations affect the management of paleontological resources on public lands:

- Federal Antiquities Act of 1906
- Omnibus Public Lands Management Act of 2009
- California Environmental Quality Act
- California Public Resources Code (Sections 5097.5 and 5097.9)

Violation of these regulations is punishable by civil and criminal penalties, including both fines and/or imprisonment, and could result in the revocation of project certification and shut-down of the project at the direction of the appropriate state agency.

# Conclusion

There is the potential for anyone involved with the excavation to find paleontological resources on the Ivanpah SEGS construction site. These resources have considerable value to us all and once removed, that value is diminished. Protect yourself, your supervisor, and your company from legal and financial liability by reporting all possible finds of historic and prehistoric remains.

# Contact Personnel

**TBD**

## Biological Monitors

**TBD**

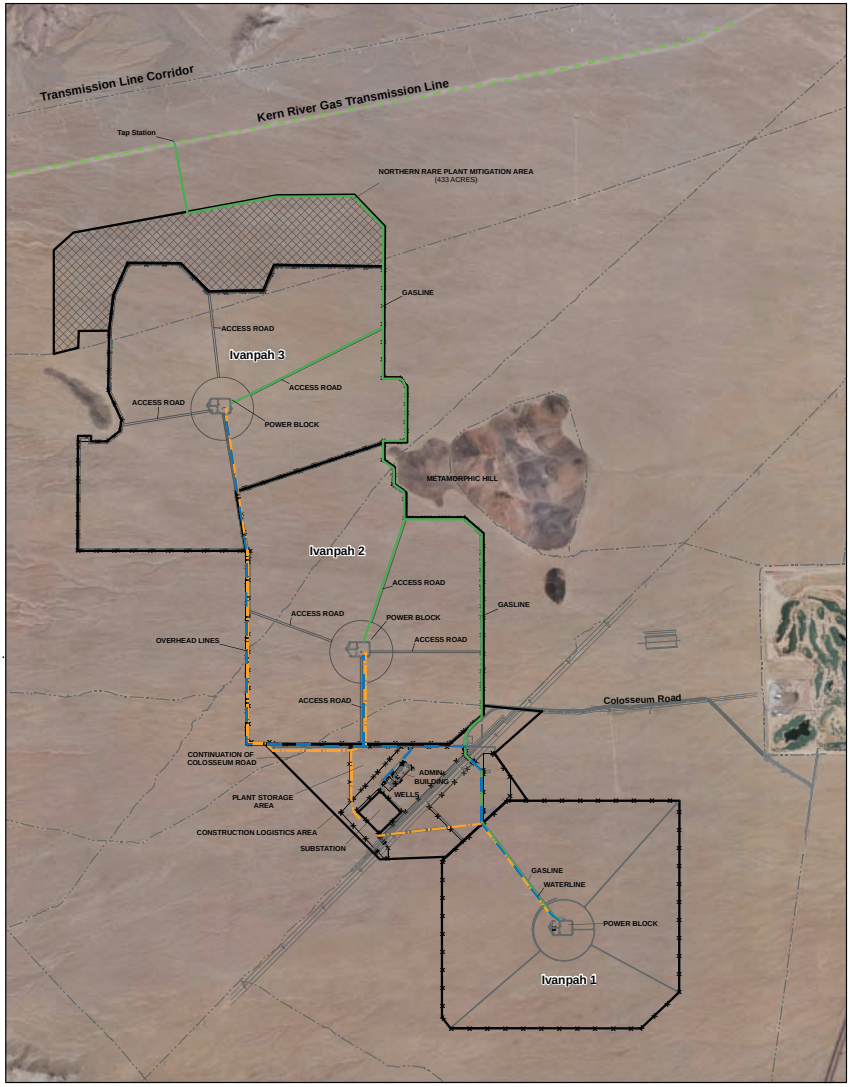
## Cultural Resources Monitors

**TBD**

## Paleontological Resources Monitors

**Designated Paleontological Resources Specialist**, Dr. Geof Spaulding
Cell (702) 524-5860, Office (702) 953-1233

# Ivanpah
# Solar Electric Generation System




LEGEND

Main Utility Features

- Proposed Gen-tieLine
- Proposed Gas Line (50-foot Corridor)
- Proposed Water Line

Project Roads

- Proposed Dirt Roads
- Proposed Gravel Road
- Proposed Paved Road
- Trails

Site Features

- Proposed Fence
- Rare Plant Mitigation Area

N

0 1,500 3,000
Feet

*COCs BIO-6, CUL-5, PAL-4*
*Draft*

# Worker Environmental Awareness Training—Script

# Ivanpah Solar Electric Generating System

**(07-AFC-5C)**

Submitted to the

**California Energy Commission**

Submitted by

**Solar Partners I, LLC; Solar Partners II, LLC; and Solar Partners VIII, LLC**

July 2010

With Assistance from

CH2MHILL
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

# Biological Resources Script

Hi my name is Mark Cochran and I am the Designated Biologist for the Ivanpah Solar Electric Generating System Project or Ivanpah SEGS for short. I am also the Field Contact Representative for all matters concerning the desert tortoise. I will have other biologists assisting me during construction. These are Authorized Biologists and Desert Tortoise Monitors that are specifically trained to survey and handle desert tortoises. I will talk more about that shortly.

I would like to take this time to go over the biological issues associated with this project and your responsibilities as an worker on this project.

BrightSource Energy is committed to protecting environmental resources in and around the Ivanpah SEGS project site. The environmental resources have been identified for the project and measures have been developed to reduce impacts to these resources from the project. Knowledge and practice of these measures are the responsibility of all onsite personnel. Violation of these protection measures can result in costly project delays as well as serious consequences for the responsible individuals. Remember, the Biological, Cultural, and Paleontological monitors are there to help you, always ask before you act. With everyone's cooperation the Ivanpah SEGS project is sure to be a success.

The Ivanpah SEGS project site and vicinity include features that provide habitat for a variety of wildlife and plants. Of particular concern for this project is the desert tortoise.

[INSERT Photo of adult tortoise]

## Desert Tortoise

The Ivanpah SEGS project site and vicinity provide habitat for the federal and state threatened desert tortoise. Desert tortoises are well documented as occupying the project site and vicinity. Any construction activity involving equipment or vehicle movement anywhere in the project site or vicinity is a potential threat to the desert tortoise. All construction activities, project vehicles, and equipment must stay within the delineated boundaries of construction areas that biologists have identified and cleared of desert tortoises. All work areas must be confined to the smallest practical area. Use previously disturbed areas to the extent feasible.

Here is some information on this interesting desert animal.

The desert tortoise is the largest reptile in the southwestern United States. It is distinguished by a domed shell. Shell color is brownish, with yellow to tan scutes (or plates). Adults can be over one foot long. Juveniles and hatchlings are smaller but resemble adults. Hatchlings can be as small as 1 ½ inches.

[INSERT Photo of hatchling tortoise]

Tortoise live as long as people. They can live to be 50 to 100 years old and take 15 to 20 years to reach sexual maturity. For this reason each tortoise represents an important part of this species local population. One 20-year-old female tortoise would have a lot of reproductive life left, if left unharmed.

Although tortoises have existed for millions of years, the number of these animals is declining. The reasons for the drop in numbers includes loss of habitat through urban development, disease, roads, introduction of exotic plants, increased predation by ravens, and collecting as pets.

Desert tortoises are protected by both the Federal and California Endangered Species Acts. Federal and state protection makes it illegal to "take" desert tortoises or destroy habitat without an exemption. Take means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." If you encounter a desert tortoise do not touch it just leave it alone. Report the observation immediately to an authorized biologist or desert tortoise monitor.

You can be penalized for damaging tortoise habitat, if it is the result of unauthorized activity; such as, driving off designated roads. Maximum fines are $100,000 for an individual; $200,000 for an organization (include a business/corporation etc.) and up to 1 year in prison.

**You and your company are responsible for obeying the law.**

[INSERT Photo of a typical tortoise burrow]

Desert tortoise could be encountered anywhere on the Ivanpah SEGS project. Be particularly watchful on roads.

Desert tortoises may be found in burrows up to 30 feet in length. If you drive off-road, you could walk or drive over a burrow without ever seeing the entrance.

Tortoises are most active from mid-February through late June and again during September and October. They may also be active during the summer, but don't range far from their burrows when temperatures are very hot. Tortoises are particularly active during or following rainfall.

Be aware that tortoises may use parked vehicles and construction equipment for shade during the heat of the day; so check under your vehicles before you move them.

Juvenile tortoises may be active throughout the year and at night. Hatchling tortoises are most abundant in the Fall. For this reason, speed limits need to be observed. These small tortoises are hard to see!

[INSERT A SLIDE of the following material highlighted in yellow]

## What you must do

- Stay within the designated construction areas that have been cleared of tortoises and on existing roads. NO CROSS COUNTRY VEHICLE TRAVEL PERMITTED.

- Be sure the area has been cleared before starting work there. Preconstruction tortoise clearance surveys must be conducted prior to all ground disturbances.
- Firearms and pets are prohibited while on the job site.
- Remove trash and food items and place in closed raven – proof containers. Otherwise this trash could attract ravens, which feed on young tortoises.
- Check under/around your vehicle and all equipment before moving it because a tortoise may be using it for shade. If one is observed, the tortoise must either be allowed to move away on its own and immediately reported to an authorized biologist or desert tortoise monitor. Only an authorized biologist with a handling permit for this species can move the tortoise out of the construction area.
- Maintain the speed limit of 20 MPH when driving in tortoise habitat to avoid tortoises that may be crossing the road. Obey the posted speed limit signs.
- If you encounter a desert tortoise DO NOT TOUCH IT – JUST LEAVE IT ALONE!
- Report any observations of tortoises or incidents involving a desert tortoise immediately to an authorized biologist or desert tortoise monitor.]

## [Photo of burrowing owl]

## Nesting Birds

The Ivanpah SEGS project site and vicinity supports various nesting opportunities for native raptors (hawks and owls) and songbirds. Most birds are busy building nests, laying eggs, and raising young in the early spring through mid-summer. Nests may be found in trees, bushes, man-made structures, like electrical transmission line towers), on the ground in burrows, like burrowing owls. Be mindful that not all nests are in trees or bushes. Some birds, like mourning doves and house finches may build their nests directly in or on structures or equipment.

Birds generally breed and nest between February 1st and September 1st. Except for a limited few, all birds, nests, eggs, and young are protected under California Fish and Game laws and by the Federal Migratory Bird Treaty Act. A violation is considered criminal and can include substantial fines and possible jail time.

### What you must do

- Stay out of designated areas that are temporarily off limits due to nesting birds. Work areas will be surveyed for nesting birds prior to and during construction. If an active nest is found, the immediate area will be temporarily off limits.
- If you see nests prior to and during construction, please notify an authorized biologist or desert tortoise monitor immediately.

## [INSERT Photo of Gila monster]

## Other Wildlife

Other wildlife species are also protected by Federal and State law. These include the Gila monster, snakes, and other reptiles. Please report any observations of Gila monsters immediately to an onsite biologist. Remember, do not handle, feed, or disturb wildlife. Gila monsters and some snakes are venomous!

# Special Status Plant Script

My name is Amy Hiss and I am one of the designated biologists for the Ivanpah SEGS Project. I am going to go over the project requirements for protecting the rare plants on the site. Rare plants are those that have special regulatory status.

The following state and Federal laws and regulations affect the management of special status plants:

- California Environmental Quality Act (CEQA), CEQA Guidelines, Section 15380. If a species is not a California or federally listed species it still may be considered endangered, rare or threatened, if the species can be shown to meet the criteria in Section 15380 of the CEQA Guidelines. Plants on the California Native Plant Society (CNPS) Lists 1B and 2 generally meet these requirements.
- CNPS List 1B and 2 plants meet the definitions of Sections 2062 and 2067 (CESA) of the California Fish and Game Code, and are eligible for state listing.
- California Native Plant Protection Act of 1977 (Fish and Game Code Section 1900 et seq.), which designates state rare, threatened, and endangered plants.
- BLM policy in California is to designate all CNPS List 1B plants, unless specifically excluded by the BLM State Director, as BLM Sensitive. Sensitive plant species designated by the State Director will be given the same level of protection as candidate plants and all of the policy statements given for candidate species apply equally to sensitive plant species.

Protecting the rare plants and making sure that the project compliance measures are implemented correctly are the responsibility of all onsite personnel. Every employee on this project needs to comply with these requirements.

BrightSource and Bechtel are committed to protecting environmental resources onsite and they have worked very hard and spent a lot of money to minimize project impacts to rare plants to the maximum degree feasible. Protection of the special status plants onsite is a requirement of the project conditions of certification. Violation of the protection measures can result in costly project delays as well as serious consequences for the responsible individuals or company who caused the infraction. This could include having to pay fines, paying for the cost of construction delays, or for the cost to implement additional remedial measures.

There are four rare plants onsite that need to be protected to be in compliance with the conditions of certification. Two of the rare plants are cactus species, which are present and identifiable all year long. The other two species are perennials but they die back to the ground after spring is over, and you can't see these plants during the rest of the year.

All of the rare plants onsite that we know about have been staked or marked in the field with yellow, orange, or white plastic stakes. If you see an orange stake anywhere onsite that means it is a plant that may be salvaged (dug up and moved to a new area). If you see yellow stakes, it means that this plant needs to be protected (with a fence) and avoided. If you see a white stake, it means this plant is in a mitigation area, which is an area set aside to protect a block of habitat and rare plants within it.

Regardless of the staking color, if you see a protective fence around anything, please stay out of the area. It may not look like anything else but dirt most of the year, but because it is fenced, it means that rare plants are there.

In addition to fencing small rare plant areas in the heliostat array, we have three mitigation areas set aside for the rare plants. Two are in the Construction Logistics Area (CLA), and one is north of Ivanpah 3. These areas will be fenced off from construction and no work can be done in them. Rare plants located in these areas have white stakes.

Here are photos of the plants:

# Rusby's desert mallow (Sphaeralcea rusbyi var. eremicola)

## [INSERT Photographs of Rusby's Desert Mallow]

Rusby's delsert mallow is a small plant (less than a foot and a half tall) that has grey-green leaves and showy orange flowers. There is another common desert mallow present onsite, and telling the rare one from the common one is very difficult. Rusby's desert mallow dies back completely every year. You will not see this plant except in the spring – so the special status plant avoidance and protection area that is fenced may just look like a fenced area with nothing but dirt and shrubs. Plastic stakes were installed near the base of each plant within the fenced areas, and they designate plants that are to be protected and monitored.

# Mojave milkweed (Asclepias nyctaginifolia)

## [INSERT Photographs of Mojave Milkweed]

This rare plant is short (less than 2 feet tall), and it has large, broad green leaves and unusual-looking small pale white to yellow flowers. You will see this special status plant only in the washes, on the bottom of the wash or on the slopes. Mojave milkweed dies back to the ground at the end of spring and you can't see it outside of this time period. In dry years, this plant may not even appear at all.

## Desert pincushion (Coryphantha chlorantha)

[INSERT Photographs of Desert Pincushion]

This rare plant is a small cactus (less than a foot tall) that you can see year-round. It can be very hard to find this species, however, because they blend into the surrounding ground. This cactus flowers in spring, but it may not flower every year. On this project, we will either be salvaging the desert pincushion, which means digging them up and then replanting them in a special area—the Rare Plant Transplantation Area—which is within the Construction Logistics Area, or we will be putting up a fence around them to protect them from construction activities.

## Parish's club-cholla (Grusonia [Opuntia] parishii)

[INSERT Photographs of, Parish's Club-Cholla]

This rare cactus occurs in low-growing "mats" that can be up to 15 feet wide. We will be salvaging a few joints (stems) at each location and replanting them in the Rare Plant Transplantation Area. You really don't want to touch this cactus (or others onsite). Other than the very large spines that this one has, some cactus species have glochids (see photograph of the fruits), which are basically small spines that can go into your skin like fishhooks. They are very painful and hard to remove, and they can also cause a rash.

There is a fifth rare plant onsite, a species of grass called nine-awned pappus grass, (*Enneapogon desvauxii*). This grass has a special life-cycle and is adapted to germinating and growing only after years with summer rains. We aren't going to be fencing this species or implementing other special protection measures for it.

## Conclusion

BrightSource has to monitor these rare plants for several years, to make sure that they are still present after construction is completed. If the habitat within the fenced avoidance and protection areas is damaged, or plants within them aren't there after construction, BrightSource will have to implement additional costly rare plant mitigation (called remedial measures). You must get clearance from the Biological Monitor before initiating work in any fenced area, even if it looks like there is nothing there.

If a rare plant avoidance and protection fence or mitigation area fence is damaged or a rare plant or its habitat may have been impacted, it is your responsibility to notify your supervisor, an Authorized Biologist, or a Biological Monitor. Redirect work away from the rare plant areas until the fence can be repaired and the Biological Monitor arrives.

If you think that you may have found a new rare plant location that has not been salvaged or protected, it is your responsibility to notify your supervisor, the CPM, the Authorized Biologist or the Biological Monitor to determine if the plant does in fact have special status. Remember, special status plants are protected. Plus, finding new special status plant locations may be beneficial in a variety of ways and could help us by understanding more about the ecological requirements of these species or offset biological mitigation and/or monitoring requirements.

# Weed Avoidance and Control

[INSERT Photo of Sahara mustard choking out native desert vegetation]

Now I'd like to talk with you about your responsibilities under BSE's Weed Control Plan for ISEGS. During construction it's important to take measures to assure that excavations and other activities do not promote weed growth in the area, and do not lead to the establishment of new weed species. Weeds usually prefer disturbed soil conditions, and their seeds commonly hitch-hike on the tires and undercarriage of heavy equipment as well as cars and trucks. Newly introduced weeds can have devastating effects on local ecosystems. A heavy growth of weeds promotes wildfires in vegetation not adapted to fire. That kind of catastrophe could seriously affect the facility, and the surrounding native vegetation may never return after such a fire. Weeds can also poison cattle, and even lead to the local extinction of native plant species. So for the safety of the facility as well as the health of the surrounding ecosystem, BSE has adopted strict weed control measures that you are required to follow. These include the following:

# Vehicle and Equipment Inspection

Immediately after you exit I-15 you will be stopped at an inspection station. ***If your truck or car is not clean you will be turned around.*** You will have to get it washed (including the undercarriage) before you are allowed to drive onto the work site. This also applies to heavy equipment *including* equipment carried on low-boys.

## Biological Monitors

Biological monitors will be present at the site and they have the authority to send any vehicle, piece of equipment, or individual off site to be cleaned if they appear to harbor weed-seed. Personal clothing that comes dirty from another site will not be allowed onto the ISEGS site. This also applies to all hand tools that have not been well-cleaned.

## Exclusion Areas

Biological monitors may identify areas where weeds appear to be taking over and, if so they will be cordoned off for measures that may include the application of herbicides. You must not enter these marked exclusion zones.

## Limiting Disturbance

Because weeds thrive on recently disturbed soils, disturbance areas will be kept as small as possible and still allow room for efficient work activities. ***No extra work spaces, overland short-cuts, or turn-outs will be allowed without the explicit approval of your construction supervisor and their inclusion in construction plans.***

It is your responsibility to be aware of these project requirements and comply with them. The biological monitors are there to help. If you have questions about anything, please ask before you act.

Thank you very much for your attention.

[Switch back to Mark Cochran]

[INSERT Photos of Designated Biologists-Field Contact Representatives]

The Ivanpah SEGS project's Designated Biologist-Field Contact Representative is responsible for implementing the projects Biological Resource Management and Implementation Plan and providing direct assistance in avoiding impacts to natural resources. The Designated Biologist-Field Contact Representative oversees compliance with protective measures during construction, operation, maintenance, and decommissioning activities that may result in injury or mortality of desert tortoises. If the Designated Biologist-Field Contact Representative, Authorized Biologist, or Desert Tortoise Monitor identifies a violation of the desert tortoise protective measures, they will halt work until the violation is corrected.

These biologists will be onsite during earthwork activities and will clear all construction areas before any and all surface disturbance begins. The Designated Biologist-Field Contact Representative duties include:

- Advise BrightSource management on how best to avoid adverse impacts to all biological resources.
- Assist the Site Superintendent in preparing construction zone limits in sensitive areas-including flagging and signage.
- Notifying BrightSource management and the Environmental Compliance Manager of a non-compliance and the corrective actions taken, and advice the construction and operation engineer when to resume construction after a stop work order has been issued.
- Notify onsite personnel if there are any changes in the mitigation plans.
- Submit monthly and annual reports to the California Energy Commission that document implementation of the conditions of certification.
- Coordinate and report to Bureau of Land Management and wildlife agencies for compliance of protection measures

Your responsibilities as an employee on this project are:

- All personnel, equipment, and vehicles are to remain inside the identified *and cleared* work area. Do not enter any area of undisturbed vegetation until you have been cleared by the authorized biologist or monitor to proceed.
- No cross-country travel outside designated and/or fenced areas is authorized. Keep out of designated exclusion areas.
- No fires. Smoke only in authorized cleared areas or in vehicles.
- Keep fluid spill containment and clean up materials readily available.
- An authorized biologist or desert tortoise monitor will be onsite or on-call during construction to answer questions regarding desert tortoises and other wildlife.

- Immediately inform an onsite biologist or monitor about injured, entrapped or dead wildlife observed onsite.

It is the responsibility of all project personnel to immediately inform an onsite biologist whenever they encounter an injured animal, an animal nest, or other animal sign onsite that needs to be moved. Wildlife sighting and observations must also be reported to the onsite biologist. The onsite biologist will fill out a Wildlife Observation Form and may need your help.

## General Work Practices

- Stay in approved work areas.
- Use only approved access roads.
- Keep out of designated exclusion areas.
- Inspect open trenches for wildlife each morning before starting work and always leave egress in trenches to allow trapped animals to leave on their own.
- Do not litter. It invites animals to the site.
- No pets, firearms or hunting on the project site.
- No fires.
- Smoke only in authorized cleared areas or in vehicles.
- Do not feed or disturb wildlife.
- Clean up and report all hazardous material spills immediately.
- Keep fluid spill containment and clean up materials readily available.
- Do not discharge water into unapproved areas.
- Protect waterways and storm drains by implementing protective measures, such as silt fencing.

The majority of resources found in the project area are protected by state and federal laws, which include, but are not limited to:

**The Federal Endangered Species Act:** Which provides protection for federal-listed threatened and endangered plant and animal species. On this project the desert tortoise is protected by this Act.

**The California Endangered Species Act:** Similar to the federal act, it prohibits the take of state-listed endangered and threatened wildlife. As previously noted, the desert tortoise is also listed as threatened by this California Act.

**The Migratory Bird Treaty Act:** Prohibits the take of migratory birds. “Take” is defined as to pursue, hunt, take, kill, capture or harass. This includes eggs, nests, and feathers of any bird, which are fully protected.

**The California Fish and Game Code:** Prohibits take of protected plants and animals in California, and protects areas designated as significant habitat.

**The Clean Water Act:** Oversees protection of jurisdictional wetlands and waterways; including the washes in the project area.

The following agencies have regulatory authority in the area and will also monitor construction activities. They could be on site at any time:

- County Officials
- California Energy Commission
- California Department of Fish and Game
- U.S. Bureau of Land Management
- U.S. Fish and Wildlife Service
- U.S. Environmental Protection Agency

Remember to stay out of exclusion zones, they protect sensitive habitats. Violations can result in stop work orders and construction delays.

## [INSERT Keep Out Sensitive Resource Sign]

Mitigation measures as conditions of certification:

- Biologists must be onsite or on-call during construction.
- Construction exclusion zones must be clearly marked to protect sensitive habitats. Cyclone, silt, and orange fencing with KEEP OUT signs mark your access boundaries-be aware of your limits.
- Preconstruction surveys must be conducted by the biologists prior to all ground disturbances.
- Impacts to biological resources will be monitored and reported to the appropriate agencies.

I would like to thank you for your time and participation and I realize this is a lot of information to absorb at once, which is why we have provided you with your Worker Awareness Training Pamphlet. It is yours to keep and refer to as necessary.

# Cultural Resources Script

Hello, my name is Clint Helton, I'm going to speak to you about cultural resources and our obligations regarding their treatment if found during the Ivanpah SEGS construction. I am the Designated Cultural Resources Specialist for the project. Me, and the onsite Cultural Resource Monitors, are your points-of-contact for questions or issues that arise regarding cultural resources for the Project. Our contact information is provided in the Environmental Awareness Program Materials and can also be obtained from the onsite construction manager.

Any trace of past human activity greater than 50 years old may be an important cultural resource. Places or sites where these traces occur are a part of a proud heritage that belongs to all of us. Significant cultural resources represent historical events, engineering achievements, and art or architecture styles that define what Americans have experienced. Ethnographic resources are also cultural resources and they may include traditional gathering areas, shrines and ceremonial areas, cemeteries, natural landscape features, and ethnic structures or districts. Because these achievements define what we are and affect what we become, the past belongs to us all and we all have a responsibility to help preserve significant cultural resources.

Archaeological and historical sites are a non-renewable resource. Though we are always creating new cultural resources for people of the future to interpret or preserve for posterity, historical and archaeological sites, once destroyed, cannot be recreated.

Archaeological remains are often so fragmentary that it is possible to scrape, dig, or bulldoze right through a buried site without realizing it. Here's what to look for:

- Discolored soil, particularly gray-black soil with a 'greasy' feel to it, in an area of lighter colored soils.
- Any animal or human bone. The proper treatment of Native American graves is of great concern. Possession of artifacts or human remains from a Native American grave is a felony (PRC 5097.99).
- A thin layer, or series of layers, particularly dark layers containing charcoal or ash, in an excavation side wall.
- Shell, freshwater or marine, or shell artifacts.
- Any unusual concentration of rocks, particularly if they seem to form a pattern (such as a campfire).
- A concentration of small pieces of broken rock, particularly obsidian or chert with sharp edges.
- A concentration of historic-era trash, including bottles, broken glass, broken ceramic, bone, and metal pieces.
- A concentration of brick, concrete, or mortared stone that might indicate a structural foundation.

## Cultural Resources Monitors

A Cultural Resources Monitor may be called upon during the course of construction to observe construction activities. It is the monitor's job to evaluate any cultural resources discovered during construction activities, and to stop work on the project if any important cultural resources are discovered.

The kinds of cultural resources that may be discovered at the site include prehistoric artifacts such as grinding stones, arrowheads, and stone flakes, and historic artifacts such as glass bottles, metal objects, animal bones and building foundations. Human skeletons may also be exposed.

## Examples of Cultural Resources

The following are examples of cultural resources that could be uncovered in the project area. The first seven examples are all stone tools shaped for specific functions.

The first example is a small hammer stone. Hammer stones were used for a wide range of tasks and may show wear at one or both ends.

Flaked cobbles were used for scraping, digging, or cutting. They can occur in a variety of shapes and sizes with a smooth end for holding.

Scrapers had a variety of uses including preparing animal skins, shaping wood, or preparing food. Depending on their function, scrapers come in many shapes and sizes.

Lithic debitage is the waste material produced during the manufacture of flaked stone tools such as knives and projectile points. Debitage may be found in a variety of shapes and sizes, often as a concentration of small flakes of stone.

Flaked knives are very distinctive and easily identified by shape and flaking pattern. Flaked knives can be found in a large number of shapes and sizes.

Projectile Points are also very distinctive, and are commonly referred to as arrowheads. Projectile points can range in size from one to six inches long and several inches wide.

The mortar and pestle were used together as a grinding tool. They were used to prepare foods, pigments, medicines, and potions.

Historic artifacts that may be present include glass bottles, bone, ceramics, metal cans and other metal objects, including wire, nails, and building hardware, as well as the remains of former building foundations.

## Your Responsibility

**If a Cultural Resources Monitor is present when a cultural resource is exposed, he or she will direct you to stop work at the location of the "find."** The Cultural Resource Specialist and Cultural Resource Monitors have the authority to halt construction in the area of a Discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS. Stopping construction in the vicinity of an archaeological find is an important condition of the project's permit from the California Energy Commission and Bureau of Land

Management and one with which we expect you to comply. Work may be stopped or redirected for only a few minutes, or it may be shut down/redirected for an extended period of time, depending on what is found.

**If a Cultural Resources Monitor is not present when a cultural resource is found, it is your responsibility to stop work and notify your supervisor, the Construction Project Manager, the Cultural Resource Specialist or Cultural Resource Monitor.** Mark the location of the find and block off access to it until the Cultural Resources Specialist or Monitor arrives. Construction in the halted work area shall not be resumed until the construction supervisor and the Cultural Resources Specialist determine how to redirect the halted work. You can use readily available materials such as barrier fencing, barrier tape, or traffic cones to ensure that construction workers and equipment do not enter the area of the find until it has been evaluated. Remember, the area of the find must be protected from potential damage to cultural resources that could be caused by construction activities.

It is illegal for you to collect any objects, including old bottles, from public land according to the California Public Resources Code (sections 5097.5 and 5097.9). Disturbing Native American burial sites is a felony under California Public Resources Code Section 5097.99. In addition, the deliberate destruction and removal of cultural resources on private and federal land is prohibited under the conditions of the Project's permits from the CEC and Bureau of Land Management.

The following state and Federal laws and regulations affect the management of cultural resources:

- Archaeological Resources Protection Act
- National Historic Preservation Act
- California Environmental Quality Act
- California Public Resources Code (Sections 5097.5, 5097.9, and 5097.99)

Violations of these regulations can result in federal indictment, and are punishable by civil and criminal penalties, including both fines and/or imprisonment, and could result in the revocation of project certifications, and shut-down of the project at the direction of the appropriate state agency.

Only authorized personnel may handle cultural resources. Notify the Cultural Resources Monitor or Site Superintendent if you think you may have found a cultural resource. Do <u>not</u> touch or move the object.

If you have any questions about these procedures, please ask your Site Superintendent or Cultural Resources Monitor for more information

Thank you very much for your attention.

# Paleontological Resources Script

My name is Geof Spaulding and I'm the Designated Paleontologist for the Ivanpah SEGS project. Our role, that is, yours and mine, on the project team is to look out for and help protect fossils that may be encountered during project excavations.

Y'all know fossils- they're the remains of prehistoric plants and animals, and they are protected by state and Federal laws. Fossils include animal bones and teeth, and plant remains such as logs and even prehistoric leaf litter. Fossils also include such things as ancient burrows and tracks, and even very small remains such as the bones of birds and rodents, and even seeds.

[INSERT Specimen Shot 1]

Here we see the track of an extinct trilobite preserved in mica-rich shale with a trilobite of about the right size. These animals went extinct some 250 million years ago.

[INSERT Specimen Shot 2]

This figure shows the fragments of two ammonites, which were essentially squids in shells. They lived in the sea that covered most of California until about 65 million years ago, when they became extinct.

Fossils are non-renewable resources because they represent life and environments that no longer exist. If they're destroyed, or taken without proper scientifically controlled collection, the detailed evidence of that past life is lost forever. It doesn't help if the fossil is in somebody's private collection. Scientists won't know that and won't have access to it. However, if properly collected, fossils provide evidence not only of the types of animals or plants that grew here in the distant past, but also valuable data on biological processes, past environments and even climate change.

As important scientific and educational resources, fossils are protected by state and Federal law. It's those laws that require all of us to specifically look for and take steps to protect fossils during excavations at the Ivanpah SEGS. The laws protecting fossils are specific: NO individual can disturb fossils except in the course of their scientific investigation and controlled recovery. So we need to take care during excavations to identify and protect any fossils that may be uncovered until they are examined and removed by a qualified paleontologist.

Important fossils rarely come from soils like those at the Ivanpah SEGS site, but they have occasionally yielded the remains of Ice Age animals and plants, incorporated in the sediment washed out of the mountains and deposited here.

[Insert Sketch 1]

For example, mammoth, as well as ground sloth and the extinct North American camel and horse, lived in the Mojave Desert during the last Ice Age. Fossils you could encounter include the remains of these large animals.

[Insert Specimen Shot 2]

[Insert Specimen Shot 3]

This picture shows a molar of an extinct North American horse, found in Arizona and about 30,000 years old.

[Insert Specimen Shot 4]

And this is the rib of an elephant that would be about the same size and shape as mammoth or mastodon.

From studies of the geology of the site we know that there are areas underlain by sediment that are old enough to contain these types of fossils. And the California Energy Commission requires that we all take measures to preserve these paleontological resources. What you should be looking for is anything that looks strange or different- a bone, or a log, or any other remain that just looks out of place or is shaped strangely. Be on the look-out for anything strange or unusual. If it doesn't look like a rock, it probably isn't a rock and it might be a fossil.

[Insert Specimen Shot 5]

When they are covered with dirt, fossils are never as obvious as these specimens. Here we have a vertebra of the extinct North American tapir, a large animal that looked like a cross between a pig and a hippo.

Insert Specimen Shot 6

Keep in mind that, even if you don't recognize what it is, if it's unusual or found deep in the ground it might be important- such as this fossil walnut, which is actually about 700,000 years old.

[Insert Specimen Shot 7]

Some fossils are scientifically important for what they can tell us of the environment in which these animals and plants lived, such as this fragment of petrified wood. Experts can identify it to the species of tree that grew on an island in the ocean that covered western California some 40 million years ago.

Now remember, if you think you've found a fossil, stop excavation; stake the find off and call your supervisor or the compliance monitor. Staking off the site of the find is important for heavy-equipment avoidance, as well as for the safety of the crew that'll investigate the find. They'll arrive as soon as possible and determine whether you've found something scientifically significant. If so, usually what we'll ask you to do is to stop operations out away from the area where the find has been made, and continue work.

Excavations can continue elsewhere while a fossil find is assessed and removed. Depending on the nature of the sediment, steps might also be taken to remove and save a sample of the dirt for later screening for small bones and teeth. After scientific recovery is completed, you or your supervisor will be informed that you can resume work there. The delay for study and recovery will be kept as short as possible to scientifically treat the find.

So if you think you've found a fossil, leave it where it is, report the find, and divert construction activities away from the find. Stake and flag the find in such a way that others will know not to

enter that area. Use construction avoidance fencing or lathe and tape to create an exclusion zone where the fossil find can be protected until removed, and where the paleontologists can work to clear the find without having to worry about heavy equipment.

If you have any questions at all about your role in protecting fossils that could be discovered here at the Ivanpah SEGS project site, ask your supervisor or call the project paleontologist who's number appears in the brochure you'll be given. They can explain the procedures that I've outlined here. We're here to help you comply with the laws, and to help in making this resource available for future generations to learn from and enjoy.

We're asking for your help. If you can be another pair of eyes, if you can call to our attention any fossils that you think you've found and if you can help in protecting them by following these procedures, we would really appreciate it.

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**List of Paleo Illustrations**

Specimen 1- Trilobite track in biotite rich Bright Angel Shale, with attendant trilobite
Specimen 2a- 2 Ammonites from Cretaceous Austin Chalk
Sketch 1 Mammoth and mastodon (shorter, stockier of the two)
Specimen 3- A tooth of the extinct North American horse
Specimen 4- Elephant rib
Specimen 5- A vertebra of the giant extinct tapir
Specimen 6- Subfossil walnut
Specimen 7- Petrified wood specimen