Thank you for your comment, Genne Nelson.

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Comments on Programmatic Environmental Impact Statement
to Evaluate Solar Energy Development on Public Lands

I commend the U.S. Bureau of Land Management for extending the comment period on the development of a Programmatic Environmental Impact Statement for Solar Energy Development on public lands after the maps of proposed study areas were released. It is easier to comment on potential site impacts when you actually know where the sites are located. I also commend the agency for taking a programmatic approach which will streamline processing of future solar development by defining general policies and mitigation strategies. Commonalities in the areas considered for solar development in the desert Southwest make this approach possible, but site-specific review for environmental differences will always be needed. Standard policies and environmental requirements also provide the solar developers with information that can facilitate their early planning stage and economic evaluation of projects.
I am also glad the BLM recognizes the importance of public land to people who live in communities surrounded by public land. Solar energy will provide benefits to millions of American. But development of utility-scale solar energy projects has the potential to have dramatic effects on not only the environment, but on the people who live near them. Rural communities that live within large tracts of public land should not bear a disproportionate burden of impacts to their quality of life for the benefit of people hundreds of miles away. Mitigation measures should protect critical components like air quality, water resources and visual resources of residents who live in the wide-open spaces.
My comments will be divided between those environmental issues that are common to the desert Southwest, and those specific to the propose site in Nevada identified as Amargosa Valley which is where I live.

Comments Relevant to the Desert Southwest

Water
Part of the reason the desert Southwest is favorable for solar energy development is the fact that it is a desert. Rainfall is slight, cloudy days are few and sunny days abundant. Consequently water resources are limited. Congress passed the Energy Independence and Security Act of 2007 which required that "…the Secretary of Energy shall transmit to Congress a report on the results of a study on methods to reduce the amount of water consumed by concentrating solar power systems." [1] The fact that congress commissioned the Department of Energy (DOE) to study water conservation measures suggests Washington recognizes the need to address water issues in the desert Southwest where solar resources are optimal.
The DOE studied four types of concentrating solar power technologies: parabolic troughs, linear Fresnel, power towers, and dish/engine. Of these, only parabolic-trough technology is currently in commercial use in this country. All but dish/engine technology use a conventional steam generation process that requires cooling in order to function. Conventional technology uses water to cool the systems. For those locations that have surface water resources, water can be circulated once through the plant and returned to the natural source. This elevates the temperature of the water with potentially significant environmental impacts, including increased evaporative loss. Recycled cooling, which would be necessary in locations like the Great Basin that lack surface water resources, essentially loses all the water resource to evaporation. Considering that the report indicates water-cooled concentrating solar plants use 500 to 650 gal/MWh, this would be a major impact on desert water supplies.
The results of the DOE report show dry cooling technology would consume about 10% of the water required for a wet-cooling system. That water savings would result in a loss of power output through loss of efficiency and an increased cost for the

dry-cooling system that would translate into a 2-10% increase in power generation costs. The actual amount would depend on the specific environmental conditions of the plant location. Certainly solar power generators would choose to use the more cost-effective plant designs. However, every energy sources carries a price. If the American people want renewable energy, then they must be willing to pay for a new technology that doesn't create other major environmental impacts. If water resources are not protected, and groundwater basins decline, the future of solar-generated power would be in peril. Furthermore, if a goal of the BLM is best use of resources, then requiring dry-cooling technology in the desert Southwest will preserve water for a larger number of solar-energy plants.

I believe the only responsible approach to solar energy in the desert Southwest is dry cooling. Certainly wet cooling should be prohibited, and hybrid wet/dry cooling only considered under special circumstances, such as waste-water recycling. Since water supplies in the desert are precious, I recommend that the BLM require that monitoring sites be selected both near and far field to solar facility water resources (wells for ground-water sources, flumes or other stream flow measurements for surface water). Plant usage should also be metered. This would provide early warning if water resources are more negatively impacted than design projections. Monitoring information should be made available to the public.

Air Quality

Due largely to the limited rainfall in the desert Southwest, the environment is strongly impacted by wind erosion. Construction and development in cities like Las Vegas, Phoenix, Tucson, Albuquerque and others create significant dust problems if controls are not implemented. Significant grading and leveling of the site is required during construction of solar facilities. Those solar technologies that use oils for heat transfer have a flammability potential that causes them to eliminate all vegetation from the solar collection facility. This disruption of the natural desert floor insures the availability of dust to wind erosion.

Wind storms are common in the desert and can cause significant to total loss of visibility which is major hazard to motorized traffic. The greater the amount of disturbed land present, the more significant the dust hazards become. Since plant designs call for large blocks of land (on the order of square miles) for the solar collection array, this can create a major wind erosion problem. All solar projects should incorporate verifiable dust control technology into their plant design. Installation of downwind air quality monitor stations should be required to insure compliance.

Dark Sky

I remember almost thirty years ago when I was attending school in Tucson that light pollution was already an issue for the National Laboratory at Kitt Peak located sixty miles away. Growth in the desert has continued and protection of the dark sky has become an important issue in recent years. The cloudless desert nights give some of the best amateur astronomic views in the country, if not encroached upon by development. Solar facilities that use mirrors need to keep them clean to optimize solar power generation. But cleaning must be done at night, which can significantly impact rural dark skies. Minimization of light pollution should be required of solar facilities in rural residential areas and in close proximity to designated land reserves like state and national parks, wildlife refuges, and wilderness areas.

Residential Impacts

A solar-energy plant is an industrial operation. BLM should not approve development of these facilities in close proximity to private property owners out of consideration of their safety and quality of life. Reasonable buffer zones should be part of the defined mitigation for plant sites in proximity to existing communities.

The impacts of housing facility workers in remote locations should be considered and plans provided before permits are granted for plant construction. Impacts of developing infrastructure for these operations must also be considered, especially when in close proximity to existing rural communities. Development of land for private housing may adversely affect ground-water supplies beyond the sustainability of desert hydrologic systems. The shorter-term impacts of a large work force of construction workers should also be considered

Like any other industrial facility, solar plants are designed for an expected functional life. Decommissioning of the facility at some future time is part of the original plan. It has long been the policy of governing agencies to require reclamation bonds for mining operations across the west. This practice should also hold true for solar-energy generation plants. Significant changes will be made during site development and future restoration of the site should be guaranteed by posting financial assurance. Along the same line, consideration should be given to the experience and track record of the solar-energy provider that insure honest commitment to power development over speculator interests.

Comments Relevant to Amargosa Valley, Nevada

Water

One hydrologic factor that should be considered as part of the EIS process specific to Amargosa Valley is the legacy contamination of ground water located beneath the Nevada Test Site. An agreement was reached between the State of Nevada Division of Environmental Protection (NDEP) and the U.S. Department of Energy (DOE) in 1996 defining a process by which underground contamination would be predicted and a system of monitoring well installed to insure compliance (under authority of the Federal Facility Agreement and Consent Order). [2] The state determined that radionuclide (RN) contamination of ground-water resources that exceeded safe drinking water standards should not leave the boundaries of the Nevada Test Site. Since that time, the Environmental Management Program of the DOE Nevada Site Office has conducted data collection and modeling for the Underground Test Areas (UGTA) subproject. Five underground test areas are located within the Nevada Test Site. The Corrective Action Units (CAUs) are studied and modeled independently and are at different stages in development. The location of the site for which this PEIS is being conducted is down-gradient of the Pahute Mesa Test Area.

The first iteration of transport modeling for the Pahute Mesa CAU was completed in 2007 [3 and 4]. Part of the findings of this

study found “The Phase I transport model predicted potential migration of RNs exceeding the contaminant boundary standard off Pahute Mesa within the 1,000-year time frame. The dominant flow path for predicted transport was characterized by convergence of groundwater flow directly south of Pahute Mesa and thence along the western flank of the resurgent dome of the Timber Mountain caldera complex…” (p.9). [5] It was further noted that “Uncertainty in the flow model evaluated during the modeling also suggested alternate flow paths with somewhat less distant RN transport” (p.9). [5]

An open house was held in Beatty in February of this year to acquaint local residents with the results of the Phase I modeling, and the plans for Phase II drilling scheduled to start in 2009. In the meeting announcement the DOE noted “The Pahute Mesa Computer Model predicts migration of tritium and carbon-14 off the NTS within 50 years of the first nuclear detonation (1966) in the Western Pahute Mesa region”. [6] Phase II drilling to collect more data for model comparison and further refinement of the Phase I model commenced in May of this year and is ongoing at the present time. The first well drilled, ER-20-7 encountered tritium that exceeded safe drinking water standards, confirming model prediction of RNs at this location. [7] This first well is located less than a mile from the NTS boundary.

It will be several years before the second round of data collection will be completed and remodeled. However, one critical aspect of the modeling program makes it important for the work that the DOE is doing be considered in this EIS—the models they are running are steady state (p.50). [5] They are predicting the migration of radionuclides based on existing water usage—quantity and point of withdrawal-- in the area. Sites for solar applications on BLM land extend up the U.S. Hwy 95 corridor from Amargosa almost to Beatty. This is an area (excluding NVN-084359 and NVN-085653) that is largely undeveloped hydrologically except for U.S. Ecology and some scattered monitoring wells installed by the Bullfrog Mine operations of the 1980-90s.

In November of 2008 the Nevada State Engineer ruled that in light of evidence that “the ground-water basin was being depleted” in Amargosa Valley, any future requests to change the point of diversion of water rights closer to Devils Hole would be denied [8]. This decision is currently being contested, but if upheld, it is likely that new water supply wells will be developed across the upper Amargosa Valley farther from Devils Hole and beyond the twenty-five mile radius established by the Order. Most of the solar application sites are in this area (as is the PEIS site). This change in existing hydraulic withdrawal from the Amargosa basin will no longer be reflected in the DOE models of ground-water contamination. I feel it is important for the BLM to begin dialog with the DOE UGTA subproject (Mr. Bill Wilborn is the subproject manager) to discuss the potential changes in the hydrologic system that may be created by development of solar energy in the Amargosa Valley. The cumulative effects over time could change the rate and direction of contaminant flow and those results need to be considered early in the process. With models currently in place, even though they are in the process of modification, the potential impacts of changes in the basin could be reviewed in a preliminary manner.

I was a member of the Community Advisory Board for six years while the CAB evaluated the adequacy of the UGTA approach to defining contaminant migration. Among our findings was the fact that Beatty was the community at highest risk for contaminant migration due to the steeper hydraulic gradient between that town and Pahute Mesa. How would moving points of ground-water diversion into the upper Amargosa basin affect that risk? The DOE has a monumental task to define ground-water contaminant transport in a largely fracture-controlled flow system from a site larger than the state of Rhode Island. As a downstream resident of the NTS, my community has a vested interest in understanding, as one resident put it, “the nature of the beast.” The only source of domestic water is from the ground and insurance of the safety of that source is vital to the future of the local communities. Free-flowing springs in Oasis Valley and Ash Meadows are unique ecosystems in the Great Basin / Mojave Desert and they also deserve protection. It is in everyone’s interest to investigate the impact of changes in the ground-water system before solar plants begin operation up the length of the valley.

One other consideration—Amargosa Basin is closed to new appropriations of water rights due to the State of Nevada’s policy to limit water use to perennial yield. When I first saw the solid line of solar applications extending from Amargosa almost to Beatty, my first thought was “put them in Crater Flat so no one will have to see them”. I have driven past Daggett and Kramer’s Corner over the years and it isn’t my idea of desert visual esthetics. But I was later discussing life in Amargosa with a USGS hydrologist that I have worked with over the years while on the CAB. He made an interesting remark that stayed with me because of my earlier desire tuck the mirrors away in Crater Flat. He basically said that Nye County should be mad at DOE about the legacy contamination. Crater Flat is basically a virgin ground-water basin with very few assigned water rights, and yet it is directly down gradient of the Pahute Mesa underground test area. Using the Nevada Water Rights database, I come up with a little over 700 AFA either certified, permitted, or reserved with another 915 AFA pending action. Considering the finite availability of water in Amargosa, this looks like a pretty good source of untapped water, if you don’t consider the impact of new pumping on contaminant migration. Should future solar operations be unable to obtain water rights in the Amargosa Basin, it would be nice to know whether water resources can be safely considered for use from adjacent basins to the area.

Again, I appreciate the opportunity to offer comments and suggestions to the development of the PEIS for solar-energy development on public lands. I am in favor of the concept renewable solar energy and have been a long advocate of wise use of public lands. But the benefits of renewable energy must weighed against other environmental impacts. The greatest obstacle to overcome in solar-energy development is impacts on scarce water resources. I am sure with careful study, reasonable mitigations can be implemented to balance environmental impacts and allow wise and sustainable solar-power development to go forward.

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Sources

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