

ORIGINAL

Arizona Corporation Commission
DOCKETED



0000108403

March 12, 2010

MAR 16 2010

RECEIVED

Hualapai Valley Solar

DOCKETED BY	<i>[Signature]</i>
-------------	--------------------

2010 MAR 16 A 10:36

Docket Control Number: L-0000NN-09-0541-00151

AZ CORP COMMISSION
DOCKET CONTROL

To whom it may concern:

This section is from my testimony in front of the Line Siting Commission in January 2010.

- 1) Hualapai Valley Solar submitted a copy of a map of the project that was filed with Docket Control, Local Mohave County Library and Lewis and Roca. It is filed under Section 17 of the Hearing Exhibits book. "I make reference to Section 2 and Section 17 again. Exhibit "A" clearly shows that this development does not fully lease / own all of the proposed project land." As of today's date they have been and are still working on this acquisition. But yet Mohave County and Hualapai Valley Solar along with Lewis & Roca clearly knew that this and yet have proposed this project incorrectly to the citizens of Mohave County."
- 2) I refer to Section 15, the City of Kingman and Mr. Greg Bartlett signed a Memorandum of Understanding for the sale of the effluent to Hualapai Valley Solar. But on that day Mr. Greg Bartlett was in a meeting at the Attorney General's Office going over the rules of the hearing set for January 12 thru January 14, 2010, from 3:00 to 4:45 pm. The City of Kingman council does not meet until 6:00 pm. So when did Mr. Bartlett actually sign this document? Since I was present at the same meeting. I make reference to the City of Kingman Agenda for January 4, 2010.
- 3) I make reference to the "outdated technology" that Hualapai Valley Solar will be using. Under section 6, page 11. Hualapai Solar makes reference to SEGS I & SEGIS II in California. SEGS I had an explosion and toxic fumes filled the air. Per Hualapai Valley Solar they are **not** in a "Fire District", they are located 27 miles from the City of Kingman. By the time the fire department gets to the scene it will be too late to protect the wildlife, the desert, the air, the citizens from all the hazardous and toxic fumes that will

be released in the surrounding area and not to mention the City of Kingman.

- 4) The last section is over 23 pages of question that I have on the "Hearing Exhibits" binder dated January 2010. These questions have not been answered, since I was not allowed to be an intervener.

Sincerely

Susan A. Bayer

As an alternative, the Applicant may build a 500-MW photo-voltaic (PV) generating facility. The interconnection Gen-Tie alternatives will be the same for the PV project as for the CSP project.

Maps of the Project site and detailed information about project facilities and technology are contained in the Application, which is available for inspection at the following locations:

- Docket Control Center of the ACC Phoenix Office at 1200 West Washington Street, Suite 108, Phoenix, Arizona 85007;
- Mohave County Library - Kingman, 3269 N. Burbank Street, Kingman, Arizona 86402; 928-692-2665; and
- Lewis and Roca LLP, 40 N. Central Avenue, Suite 1900, Phoenix, Arizona 85004.

Each county and municipal government and state agency interested in the proposed Project and desiring to be a party to the proceedings shall, not less than ten days before the date set for hearing, file with the Director of Utilities, Arizona Corporation Commission, 1200 West Washington Street, Phoenix, Arizona 85007, notice of intent to be a party.

Any domestic non-profit corporation or association formed in whole or in part to promote conservation of natural beauty, to protect the environment, personal health or other biological values, to preserve historical sites, to promote consumer interests, to represent commercial and industrial groups, or to promote the orderly development of the area in which the Project is to be located and desiring to become a party to the proceedings shall, not less than ten days before the date set for hearing, file with the Director of Utilities, Arizona Corporation Commission, 1200 West Washington Street, Phoenix, Arizona 85007 a notice of intent to be a party.

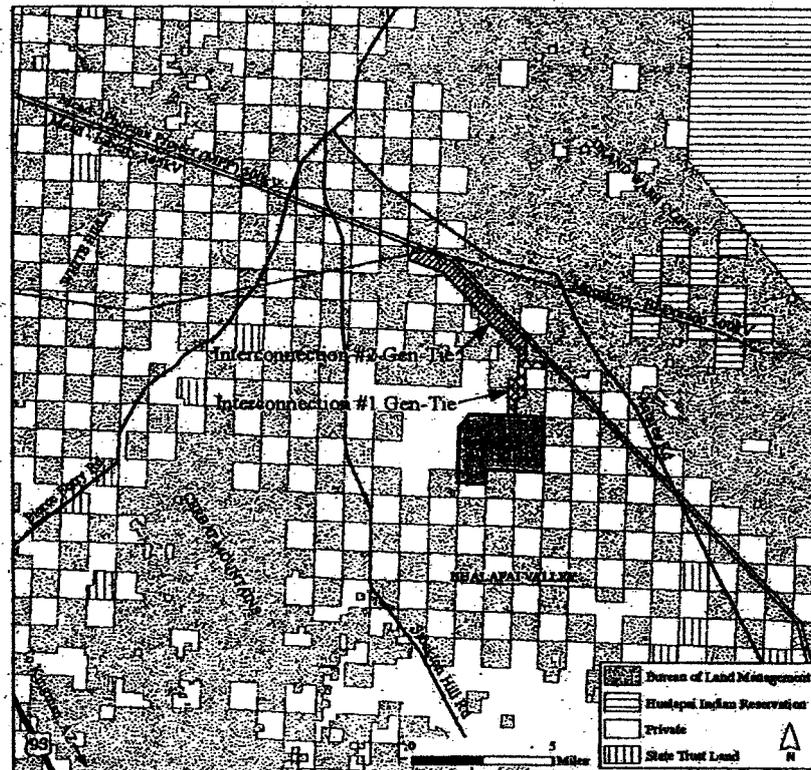
The Committee or its Chairman, at any time deemed appropriate, may make other persons parties to the proceeding.

Any person may make a limited appearance at a hearing by filing a statement in writing with Docket Control of the Arizona Corporation Commission, 1200 West Washington Street, Phoenix, Arizona 85007, and the Chairman of the Committee at 1275 West Washington Street, Phoenix, Arizona 85007, not less than five days before the date set for hearing. A person making a limited appearance shall not be a party or have the right to present testimony or cross-examine witnesses.

This proceeding is governed by Arizona Revised Statutes Sections 40-360 to 40-360.13 and Arizona Administrative Code R14-3-201 to R14-3-220. No substantive communication not in the public record may be made to any member of the Committee. The written decision of the Committee will be submitted to the Arizona Corporation Commission pursuant to Arizona Revised Statutes Section 40-360.07. Any person intending to be a party to the proceedings on these matters before the Arizona Corporation Commission must be a party to the proceedings before the Committee.

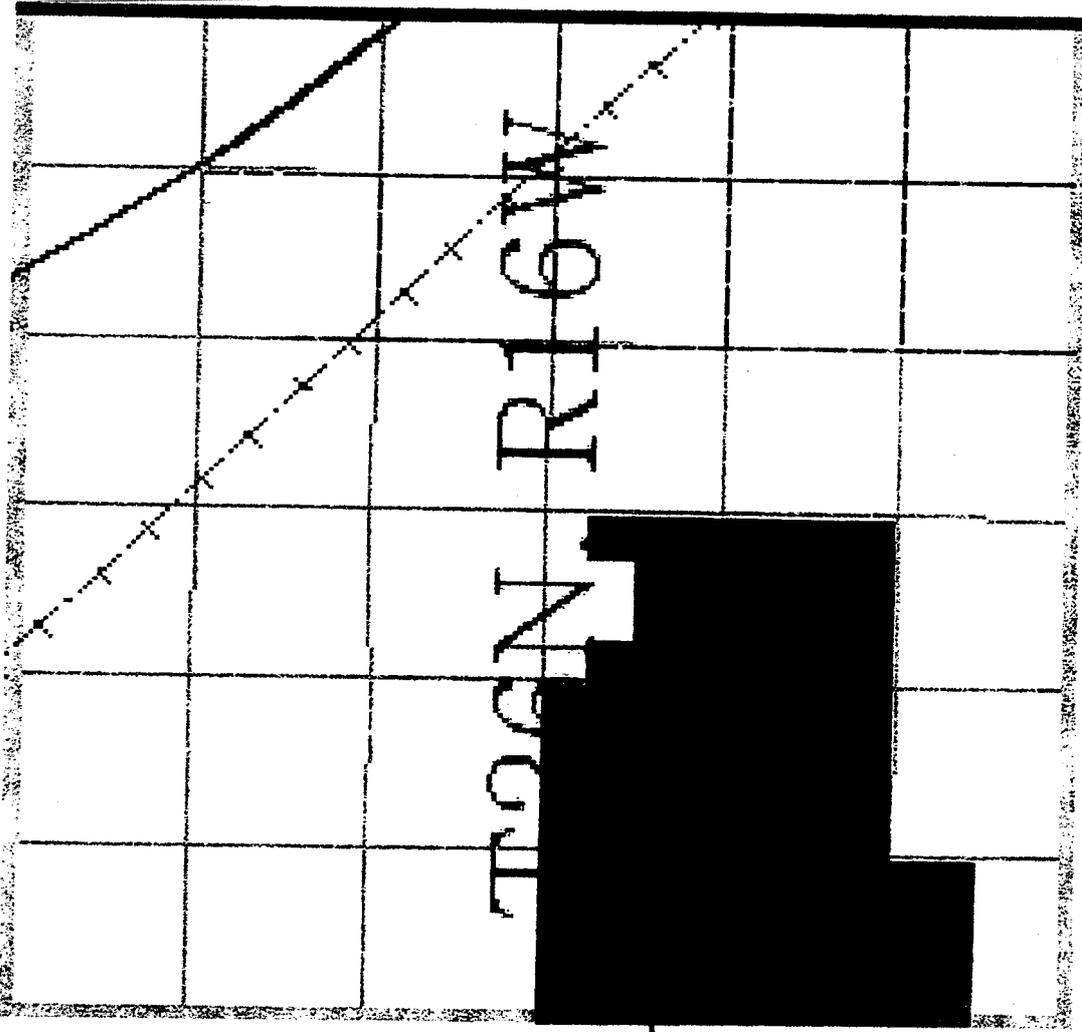
ORDERED this 24th day of November, 2009.

/ s / John Foreman
John Foreman, CHAIRMAN
ARIZONA POWER PLANT AND TRANSMISSION
LINE SITING COMMITTEE
ASSISTANT ATTORNEY GENERAL



refer to Section 17

Exhibit "A"



Section
2
Exhibit
A Section
17

Evaluation of a request for the approval of a MAJOR AMENDMENT TO THE MOHAVE COUNTY GENERAL PLAN for Sections 19, 20, 28, 29, 30, and N 1/2 of Section 31, and Section 21 excluding N 1/2 N 1/2 and SE 1/4 NW 1/4 and SW 1/4 NE 1/4 thereof, in Township 26 North, Range 16 West to change the land use designation from a RDA (Rural Development Area) land use designation to an RDA, RI (Rural Development Area, Rural Industrial) land use designation and amending Exhibits VI.4 and VI.6 of the General Plan to match, consisting of approximately 6.3 square miles in the Mohave County General Area, Mohave County, Arizona.

**CITY OF KINGMAN
MEETING OF THE COMMON COUNCIL
Council Chambers
310 N. 4th Street**

6:00 P.M.

AGENDA

Monday, January 4, 2010

REGULAR MEETING

CALL TO ORDER & ROLL CALL—ALL MEMBERS PRESENT

INVOCATION will be given by Chaplain Dave Patriquin of the Kingman Fire Department Honor Guard

PLEDGE OF ALLEGIANCE

THE COUNCIL MAY GO INTO EXECUTIVE SESSION FOR LEGAL COUNSEL IN ACCORDANCE WITH A.R.S.38-431.03(A) 3 TO DISCUSS ANY AGENDA ITEM. THE FOLLOWING ITEMS MAY BE DISCUSSED, CONSIDERED AND DECISIONS MADE RELATING THERETO:

1. APPROVAL OF MINUTES

The Regular Meeting minutes of December 21, 2009. **MOTION TO APPROVE WAS PASSED BY A VOTE OF 7-0**

2. APPOINTMENTS

2010 Municipal Utility Commissioner Appointments

The Municipal Utility Commission met on December 17, 2009 to review its membership and applications for reappointment and replacement to the Commission. Stuart Anderson and Marvin Yarbrough's second terms both ended on December 31, 2009, with Stuart Anderson not seeking another term. Marvin Yarbrough was recommended for a third term. This will require a supermajority vote of the Council. David Amspoker's first term ends on December 31, 2009. He is willing to serve a second term and was recommended for reappointment by the Commission to serve such term. Craig Schritter indicated that he will be resigning to accept an appointment to the Planning and Zoning Commission, leaving a two year term unfilled. The Commission interviewed Kathleen Murray and Dustin Lewis and recommends they be appointed to fill the vacancy of Stuart Anderson for a three year term and fill the remaining two year term for Craig Schritter. **The Commission by a vote of 6-0 recommends reappointments and appointments of:**

- 1. Marvin Yarbrough for reappointment by supermajority vote of Council**
- 2. David Amspoker for reappointment**
- 3. Kathleen Murray for appointment through December 2012**
- 4. Dustin Lewis for appointment replacing Craig Schritter through December 2011**

MOTION TO REAPPOINT YARBROUGH WAS APPROVED BY A VOTE OF 7-0

MOTION TO REAPPOINT ANSPOKER WAS APPROVED BY A VOTE OF 7-0

MOTION TO APPOINT MURRAY WAS APPROVED BY A VOTE OF 7-0

MOTION TO APPOINT LEWIS WAS APPROVED BY A VOTE OF 7-0

approving operations on the site. Staff recommends scheduling a Public Auction of Parcels IV-U-B-E and IV-U-B-C-a at the Kingman Airport and Industrial Park for the January 18, 2010 regular City Council meeting. MOTION TO APPROVE AFTER CHANGING THE DATE TO JANUARY 19, 2010 WAS PASSED BY A VOTE OF 7-0

i. **Property Management Agreement between the City of Kingman and the Kingman Area Chamber of Commerce**

The Property Management Agreement between the City of Kingman and the Kingman Area Chamber of Commerce is due for renewal. The agreement requires the Chamber to collect all rents and remit them to the City, maintain the property, assist the City in advertising vacant space and assist in screening applicants, and assist the City in enforcing rules and policies, as well as amending rules and policies as needed. If signed, the agreement will expire on December 31, 2012. Staff recommends that Council allow the City Manager to sign the Property Management Contract with the Kingman Area Chamber of Commerce. MOTION TO APPROVE WAS PASSED BY A VOTE OF 7-0

6. **OLD BUSINESS**

Memorandum of Understand (MOU) For Sale of Effluent to Hualapai Valley Solar LLC

The City of Kingman has been approached by Hualapai Valley Solar regarding the sale of effluent produced by the upgraded Hilltop Wastewater Treatment Plant. The City of Kingman previously provided a non-binding letter indicating desire to provide the effluent. The City staff has met with a representative of HVS and negotiated an MOU for Council review and approval. Staff requests that Council provide direction to staff for modifications or authorize the Mayor to sign the MOU. MOTION TO APPROVE WAS PASSED BY A VOTE OF 7-0

7. **NEW BUSINESS**

a. **Letter of Support for the Kingman Route 66 Association Grant Application**

Chris Durkin, of the Kingman Route 66 Association has requested a letter of support from the City of Kingman to submit along with a grant application. The grant they are applying for is through the Arizona Department of Commerce and will be used for their Historic Sign Restoration Project. Staff requests direction from Council. MOTION TO APPROVE WAS PASSED BY A VOTE OF 7-0

b. **Resolution No. 4653 – Water Service To An Unsubdivided Parcel Identified as Tax Parcel 320-11-139 for a Carl's Junior Restaurant**

On December 17, 2009, the Municipal Utility Commission reviewed a request from Jeff Dietz for water service to an unsubdivided parcel identified as Tax Parcel 320-11-139. This water service request is for development of a Carl's Junior Restaurant on the 0.9 acre property at 3440 Stockton Hill Road, just north of Brake Masters. Resolution No. 4653 grants water service to parcel 320-11-139 for the subject restaurant. The Utility Commission voted 6-0 to recommend approval of water service to the subject unsubdivided parcel. The Commission voted 6-0 to recommend approval of water service to Tax Parcel 320-11-139. Staff recommends approval of Resolution No. 4653. MOTION TO APPROVE WAS PASSED BY A VOTE OF 7-0



Section 6

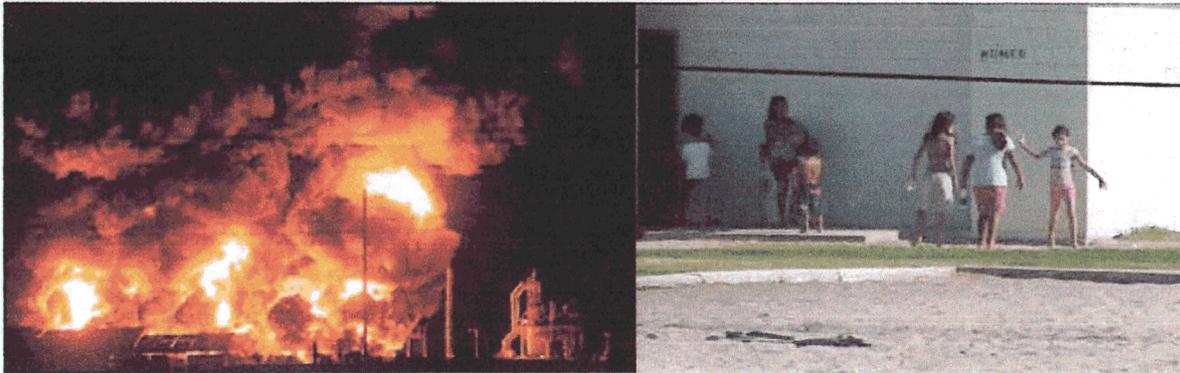
pg 11

exhibit

not in a

Fire District

Amargosa Valley - Solar Millennium



^(Left) Daggett solar thermal plant explosion, 1999; notice the mirrors at lower left ([Photo by Lara Hartley](#)). (Right) Kids at park in Amargosa Valley by elementary school which would be less than 1 and 1/4 miles from the proposed solar mirror field of Solar Millennium's plan.

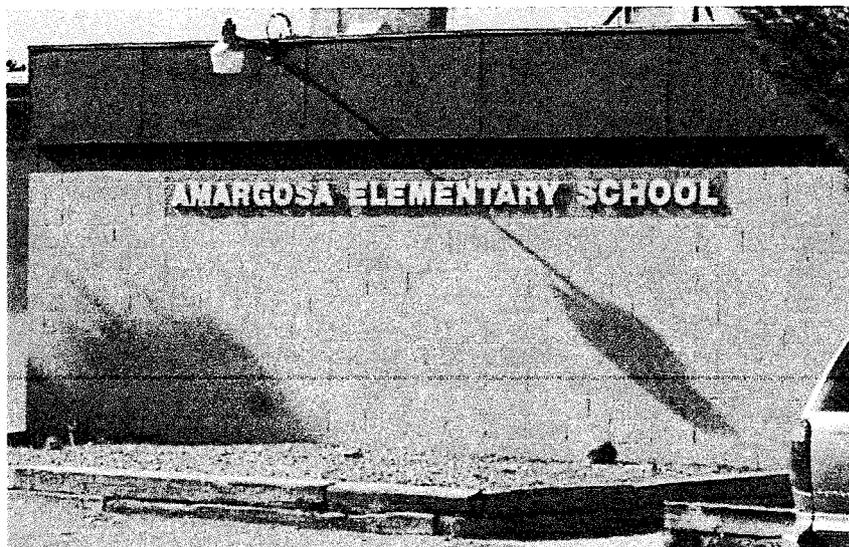
Explosion Dangers: Solar Industrial Projects and Schools Do Not Mix!

August 18, 2009 - Amargosa Valley, Nevada

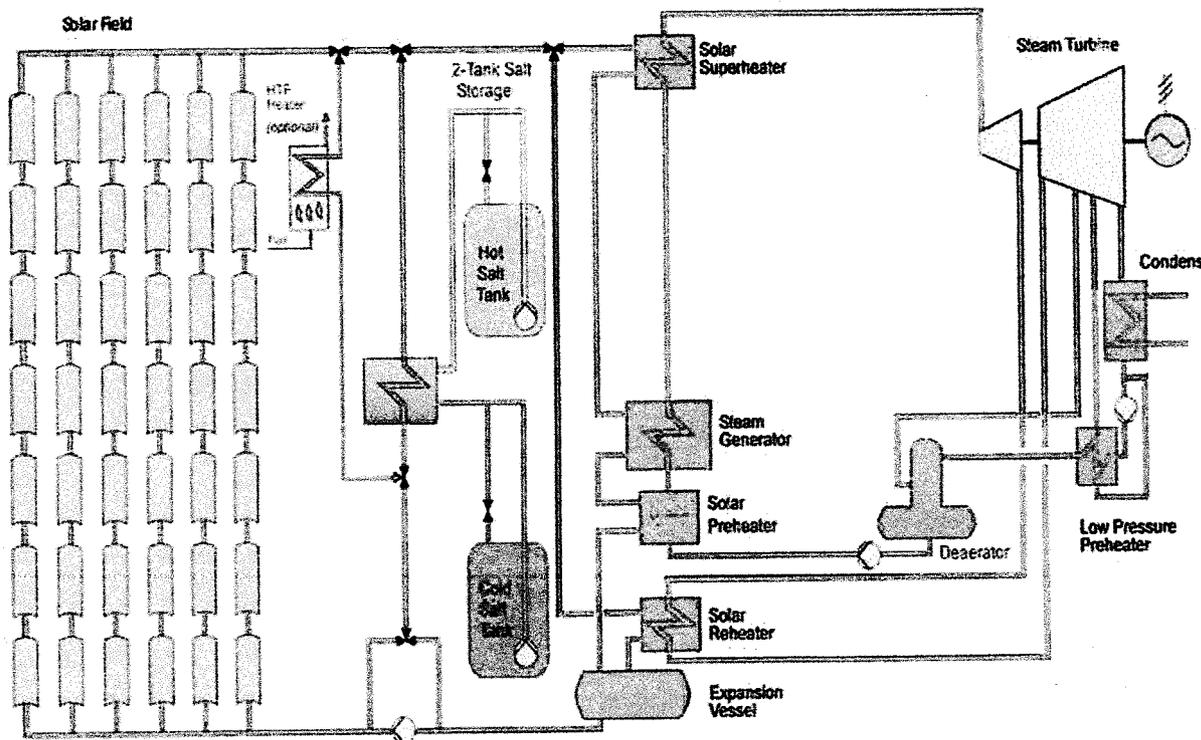
That was the message of many residents at a Bureau of Land Management (BLM) scoping meeting in the town of Amargosa Valley, Nye County, Nevada. They were well organized and vocal about the dangers of having a huge industrial solar thermal project in the midst of their community on the flat desert along the Amargosa River, surrounded by public lands that are being increasingly snatched up for renewable development in a new land rush.



^Scoping meeting. The community center was crowded.

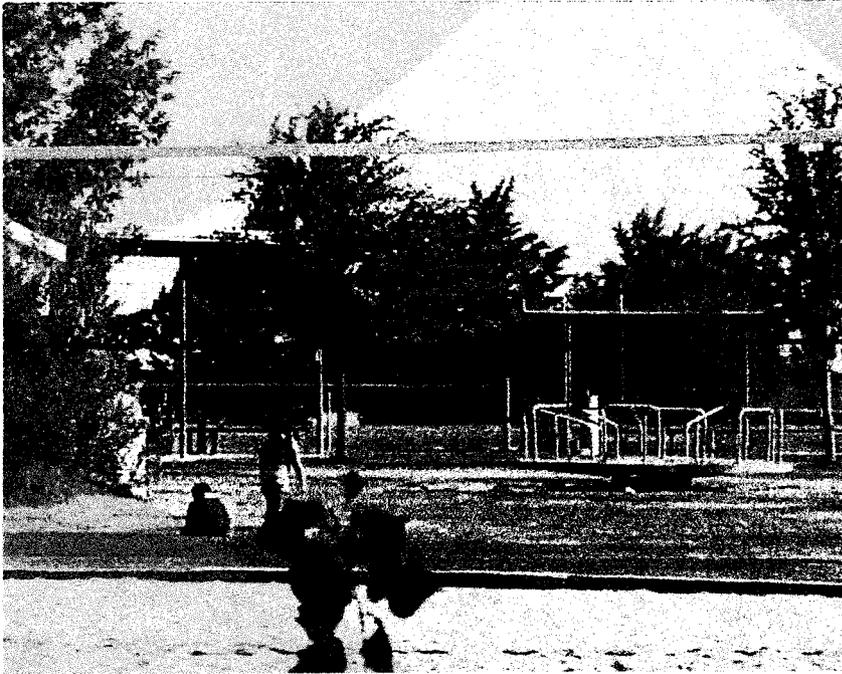


The German company Solar Millennium AG wants to lease 7,810 acres of BLM land that intermingles with the town, placing giant parabolic mirror fields with superheated oil (Therminol) on 4,350 acres, within a quarter mile of many homes, and less than a mile and a quarter from Amargosa Elementary School and a park. Two power blocks would also be within these fields, including two thermal storage tanks in each, containing molten salt - an experimental technology - as well as large steam turbine engines like those used in conventional fossil fuel plants.



Plant Schematic Diagram (with Thermal Storage)

(From Solar Millennium's Plan of Development pdf)



Many residents voiced concerns about explosion and fire dangers from such a power plant, citing the 1999 explosion at the Daggett SEGS Solar 1 plant . The SEGS 1 plant used new molten salt thermal storage technology developed in the 1980s, and initially had 3 hours of thermal energy storage that was used to dispatch to peak period. But the storage system was damaged by an explosion and was not replaced (source: National Renewable Energy Laboratory -http://www.nrel.gov/csp/troughnet/power_plant_data.html). (See below.)

This plant had a nameplate maximum capacity of only 13.8 megawatts (MW). Solar Millennium is seeking 242 MW. The heat transfer fluid **Therminol** will be used in Solar Millennium's design, similar to the Caloria oil that burned uncontrollably all night at SEGS 1. Pipe ruptures in the parabolic trough fields are a hazard.

Several residents stood up to speak about how the local volunteer fire department would not be able to handle an oil spill or fire involving specialized chemicals. Who will supply the needed equipment to cope with this industry? One man said a quarter-mile buffer zone was needed between the plant and residences at least. Questions were raised about how to evacuate the school in the event of a fire at the solar plant. Someone commented that he doubted that the execs of Solar Millennium would live so close.

Also, some pointed out that the mirror construction area was right across the street from the school, and surrounding a park: how much truck traffic would be going on the school road? Will kids be hit? "Why here?" the person demanded to know.

"There is a political frenzy to rush these plants for the economy, but at what cost?" asked an audience participant. "We are not guinea pigs. Maybe BLM did not realize that homes were so close, we urge you to find a way to move this plant," the person said, addressing the BLM managers. "We need solar power, but just not in our yard!"

A resident who told us she lived a mile from the proposed plant handed out sheets with photos of the explosion at Daggett, and had a color poster with comments, but she was not allowed to show the poster during the proceedings of the meeting.

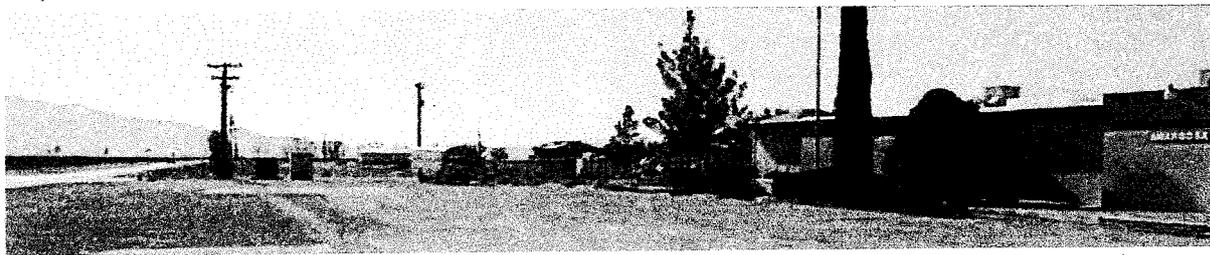
The draft Environmental Impact Statement will be out after January 1, 2010, according to Greg Helseth, BLM Renewable Energy Project Manager

One man reminded the panel that Amargosa Valley was developing an area plan that called for a quiet, rural place.

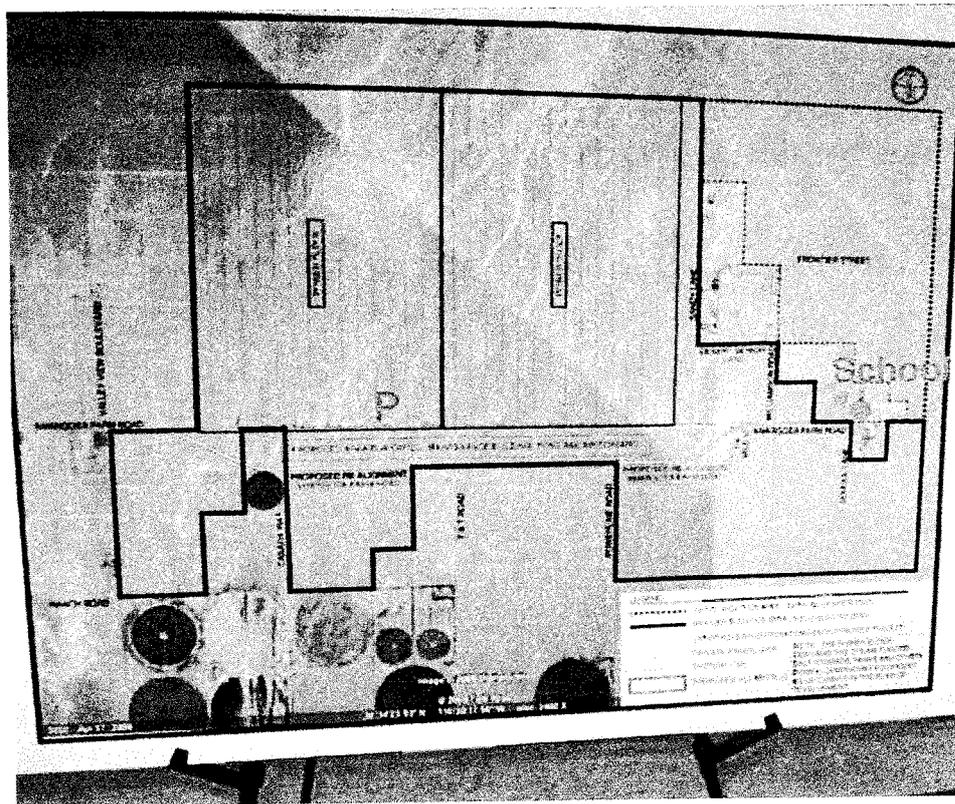
Jan Cameron, chairman of the Amargosa Town Board, stood up and explained that the area plan was approved after two years work on it. She would like to see some solar development north of Frontier Road, to bring jobs and energy, but the safety of people needed to be considered. "A lot of an EIS is bugs, bunnies and bushes and not so much the human concerns." There would also be many infrastructure impacts to town, as well as the issue of water, she said.

A 33-year resident declared, "I love this desert," but went on to say how there seemed to be more protection for pupfish than for people. The crowd applauded strongly.

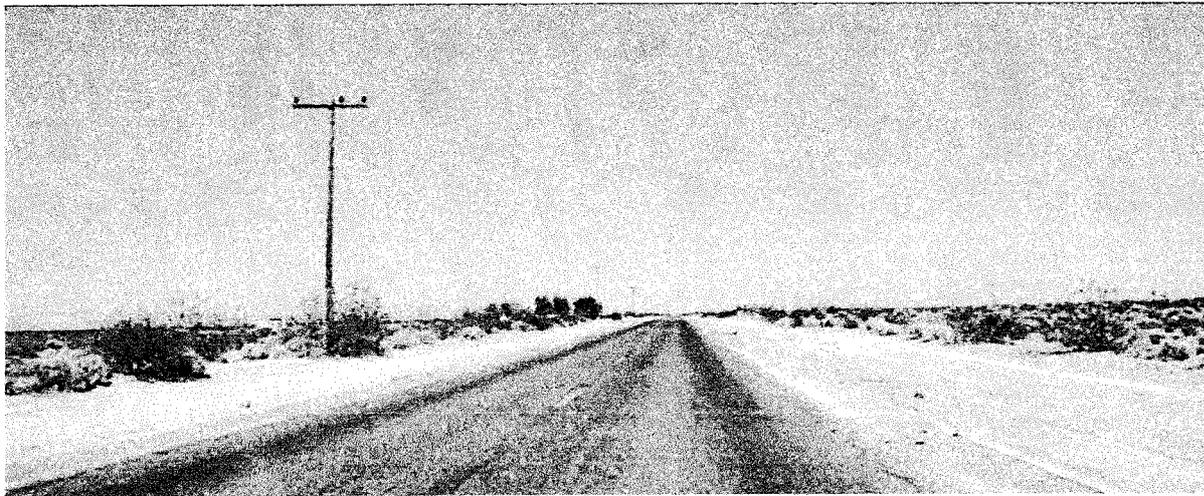
The brochure describing Solar Millenium's Andasol 1-3 plants in Spain, similar to the Amargosa Valley proposal, states, "No residential buildings are located adjacent to the site of the power plant" (source: The Parabolic trough power plants Andasol 1 to 3: The largest solar power plants in the world -- Technology premiere in Europe, pdf, page 10). This was apparently a concern in Europe -- why not in the U.S.?



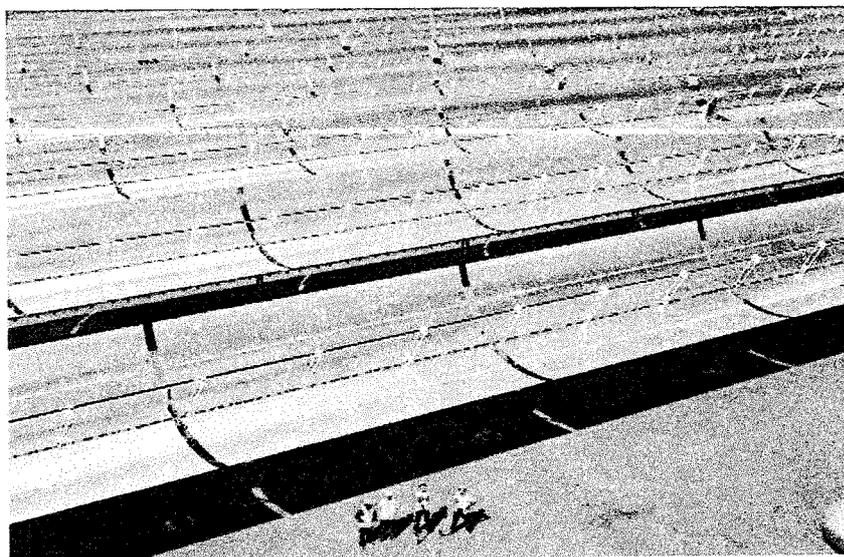
^School and creosote desert beyond that would be the solar field of Solar Millennium's development.



^The applicant Solar Millennium had this poster at the scoping meeting, showing a revised project boundary. The mirror fields lie less than 1 and 1/4 mile from the school, park, senior center, and community center. Irrigated fields lie to the south of the project, and homes scattered throughout the area. **P** = photo location below.



^Amargosa Farm Road now, at location marked **P** on map above, driving eastbound. Under Solar Millennium's plan this would be rerouted and the area used for offices and buildings next to the solar field to the left in the photo.



^Solar field: giant parabolic mirrors 30-feet across of Andasol 1, Solar Millennium's test plant in Spain which they will imitate in Amargosa Valley if permitted.



^Home next to the proposed solar field.

Many residents of Sandy Lane spoke up. One woman told how they were right across the street from the project. "We feel like we're in the way of Solar Millennium," she said. She explained how the company could have chosen any area around the valley when they filed

in 2007, but chose to locate right in the middle of town. They developed their plan in secrecy, and did not share it until May 2009 (see our report on this meeting >>here). Another resident pointed out how BLM had a backlog of applications for more solar projects, that filled thousands of acres of the valley, so it would be difficult to relocate.

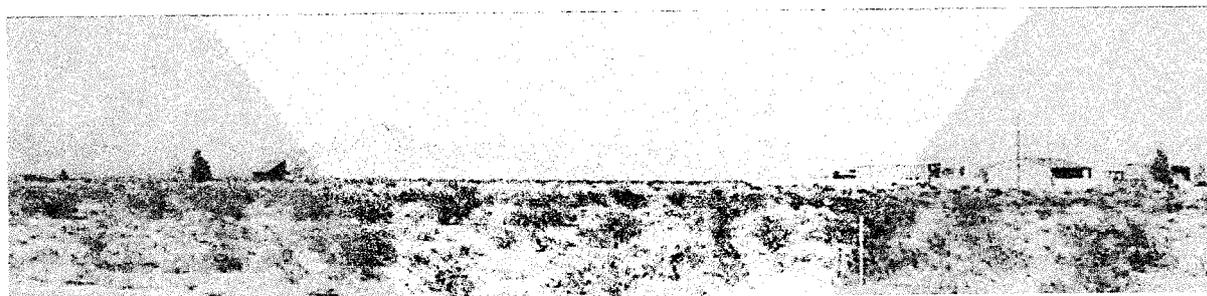
Las Vegas BLM Renewable Energy Project Manager Gregory Helseth confirmed that he was dealing with 57 applications in Nevada, trying to dissolve ones when the companies were no longer interested. He will be meeting with CoGentrix soon, he said, to work on reducing their application number. Yes, he agreed that Solar Millennium was "locked in" by CoGentrix to the north. But he explained that BLM receives "memos from Washington" telling them they cannot stop accepting applications.

"It will be an eyesore right in the middle of town," a resident said.

Another Sandy Lane resident explained how the project would also be right across from her porch, where she sits in the morning with coffee, watching the colors of the sunrise on the mountains. If Solar Millennium gets approval to build, she would instead see the glare of mirrors. "It should be five miles out!" She was also concerned about the heat and dust from "our horrendous winds out here." She said the church was also on the boundary of the project. "This is home, this is life." Several people clapped.



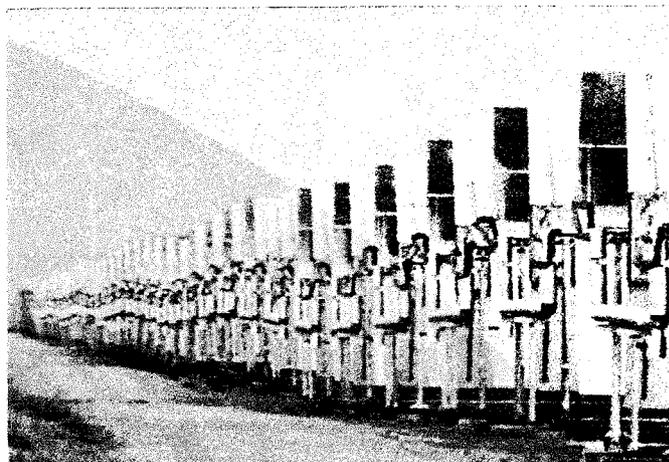
^Andasol 1, Spain, the first parabolic trough power plant in Europe generating electricity since December 2008.



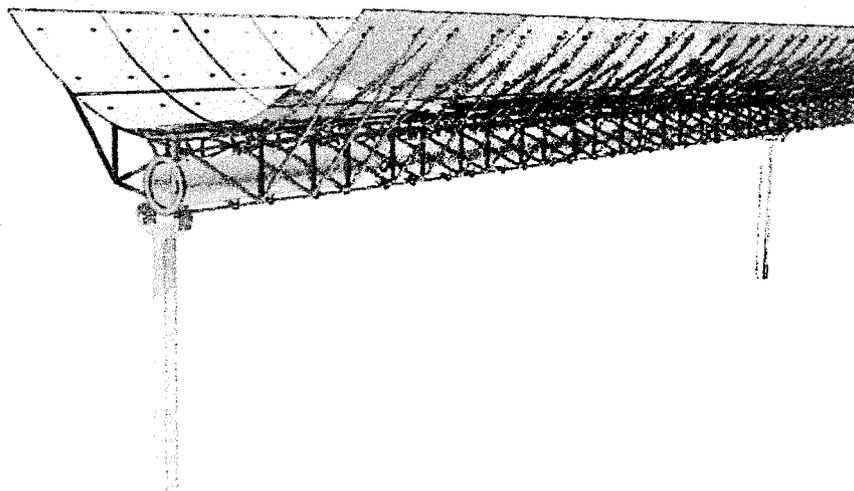
^BLM land with open desert interspersed with private land.



^Residences next to the project boundary.



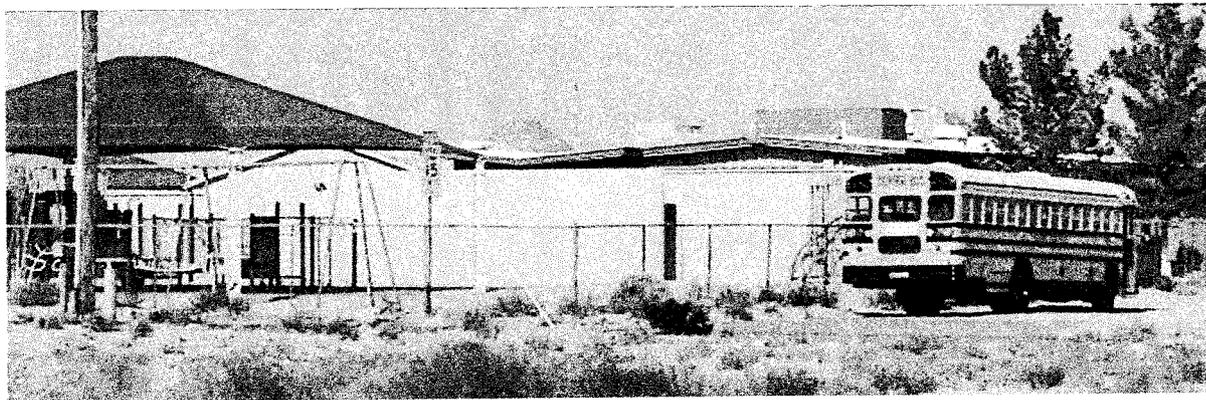
^Parabolic trough field.



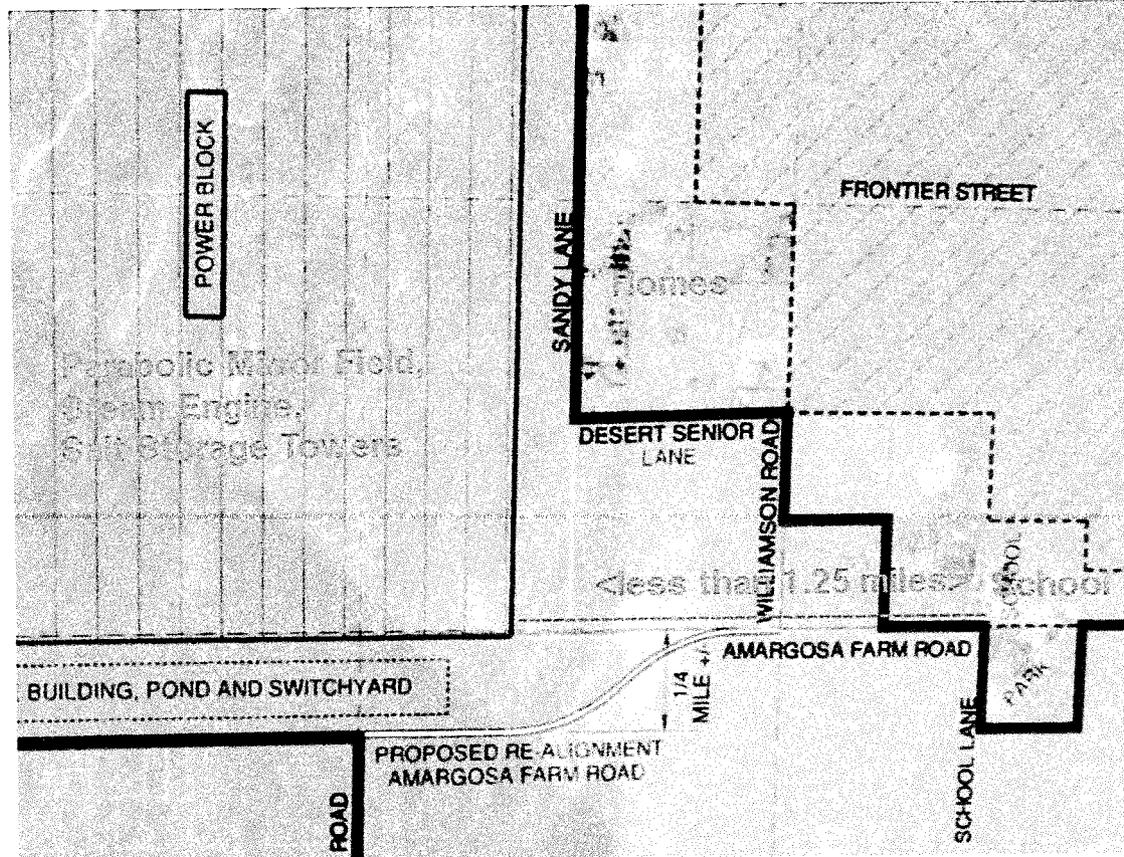
^Parabolic trough mirror (from Solar Millennium's [Plan of Development](#) pdf).



^Park across from school along Amargosa Farm Road, which will become the main entry point for trucks delivering building materials for Solar Millennium's proposed energy development.



^Elementary school along Amargosa Farm Road, in the path of industrial solar.



^Too close for comfort: homes and school near power plant that will use superheated hydrocarbon oil, molten salt, and other chemicals, some quite toxic. The park across from the school will be surrounded by a maintenance yard and pre-construction area.

Water, Dust, Impacts to the Town

Other concerns raised by audience members included dust control, flooding of Forty-mile Wash that crossed the proposed solar field, harmful chemicals getting into the groundwater and drinking supply, and will Valley Electric raise rates when required to buy this new electricity? Another question pointed to how Arizona BLM has forms that the public can send in to recommend previously disturbed areas and brownfields to site solar and wind developments so that pristine desert habitats are not destroyed -- Nevada BLM should consider similar programs.

Mr. Guerra, a 30-year resident of town said Solar Millennium should pay it's way in Amargosa Valley, as it impacts the roads and services. The company should help pay for upgrades to the fire station, medical clinic, Beatty High School where students bus to. Other residents had voiced concerns over the size of the project overwhelming Amargosa Valley. Will Solar Millennium be busing in a workforce? asked one man. He pointed out that often the original understanding of the company with a community is not passed on when the company is sold. Guerra also told BLM it needed to put out a Spanish translation of the plan so that the many Spanish-speaking workers in the community could better participate in the process.

Brian Brown, running the China Ranch date farm downriver in Tecopa, California, came to represent of the Amargosa Conservancy. He pointed out that a wet-cooled system that Solar Millennium wants for its solar plants is not sustainable in this region, "one of the driest places in the nation, in a basin already in overdraft." There are threatened and endangered species along the river -- a "world-class" suite of species." This project would be the first on the way to making the whole valley a huge industrial zone, of 60,000 to 70,000 acres. The environmental effects of this would go on for hundreds of years. If this amount of desert were scraped, the dust problem would be negative, he said. Many in the audience applauded.

A retired Vegas Valley Water District employee and resident of the nearby town of Crystal added that contaminated groundwater from the atomic test site to the northeast was flowing faster than expected, during recent test measurements. It has not yet left the test site boundary, but the man wondered if high-production wells were put in at Solar Millennium's site would increase the movement of this water toward town. "Use wind, save our most precious resource -- water," he said.

Tribal Concerns

The Timbisha Shoshone Tribe was represented by Barbara Durham. "It seems like yesterday we were having to protect our rights and our land, and here we are again," she said, referring the proposed Yucca Mountain Nuclear Waste Repository in an arm of the valley about 20 miles to the northeast.

The Timbisha have a trust parcel of land south downriver at Death Valley Junction, so they are quite concerned about the water usage of Solar Millennium's plan. "I will say our tribe is in favor of alternative energy, but I think we're going to have to support the people of Amargosa Valley on how this is going to affect them and us down the road," Durham said.

This area was used by the Shoshone and Southern Paiute, so they also had issues with potential cultural sites on the project area.

Durham scolded the BLM about how the government agency said it was in consultation with tribes over the project. "We haven't talked at all, haven't even begun consultation with BLM," she told BLM representatives on the panel. "We have a government-to-government relationship with the BLM," she pointed out. "We need to start talking."

Durham also said that clearing the ground for the project is a concern for the Tribe, as well as loss of plants and animals on the desert. "A lot of residents have talked about the eyesore this is going to cause and the heat that's going to radiate from it. I'm not sure how that's going to go, but I'm sure it's going to be a problem in the future."

Supporters in the Minority

A few people in the audience were for the proposal, citing potential jobs. Funeral Mountain Ranch owner Bill DeWit voiced his support. "I own a lot of property south of Farm Road, right next to the plant." He did not mind the close proximity. "The economic impact will be beneficial to the valley," he went on. "Kids go to university and don't come back here. We need projects like this for economic development." Several people clapped.

Darrel Lacey, a Nye County representative, also read a statement supporting Solar Millennium on the grounds that it

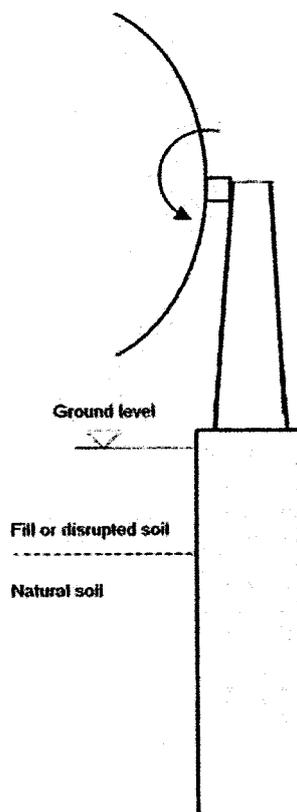
would increase jobs and tax revenues. He said the county would work on addressing the water issues, fire response, dust control, and buffer zones and fences next to residences.

Also see story in the Pahrump Valley Times >> [here](#).

Explosion Dangers of Solar Thermal



<The fire still smolders and burns more than 14 hours after it started. (Photo by Lara Hartley)



^Cement foundation of parabolic mirror, buried in the ground, with surrounding soil bare (from Solar Millennium's [Plan of Development pdf](#))

From the National Renewable Energy Laboratory:

SEGS I

Location: Mojave Desert, Daggett, San Bernardino County, California.

First Year of Operation: 1985

Type: Solar electric generating station (SEGS) with parabolic troughs; solar steam generation with natural gas superheating, including three hours of thermal energy storage.

Fossil fuel: Natural gas **Net Output:** 13.8 MW

Principals: Sunray Energy, Inc. (owner/operator), Luz (developer), Southern California Edison (utility PPA).

Solar Technology: Luz LS-1 and LS-2 collectors

Project Type: Public Utility Regulatory Policies Act (PURPA) Qualifying Facility IPP with special Standard Offer 2 (SO-2) type power purchase agreement to Southern California Edison.

Operational Dispatch: Solar operation during sunny hours. The plant initially had 3 hours of thermal energy storage that was used to dispatch to peak period. The storage system was damaged by fire in 1999 and was not replaced.

Special Incentives: Federal and state investment tax credits, solar property tax exclusion, accelerated depreciation.

Status: Daily operation. The two-tank thermal energy storage system used mineral oil (Caloria) heat transfer fluid to store energy for later use. It operated between 1985 and 1999.

SEGS II

Location: Mojave Desert, Daggett, California

First Year of Operation: 1986

Type: Solar electric generating station (SEGS) power tower; solar steam generation and solar superheating; auxiliary natural gas boiler to provide backup capability during low and non-solar hours.

Fossil fuel: Natural gas **Net Output:** 30 MW

Status: 2009 being dismantled and no longer in use (Barstow Daily Dispatch [2009](#)).



<The SEGS 1 fire burning high temperature oil used to transport heat from the troughs to a thermal storage tank. There have apparently been TWO FIRES here. One fire was caused by a natural gas problem in the power block; an earlier fire was due to overheating the oil (human error) and was caused by a trough tube leak (according to Red Rock Energy, <http://www.redrock.com/hello.htm>)

In February 1999 a massive explosion shook the plant and surrounding area. It was just a few miles from photographer Lara Hartley's place, and she drove over to take pictures (see

http://www.digitalstoryteller.com/STV02/hartley_0002.html). She reported that 900,000 gallons

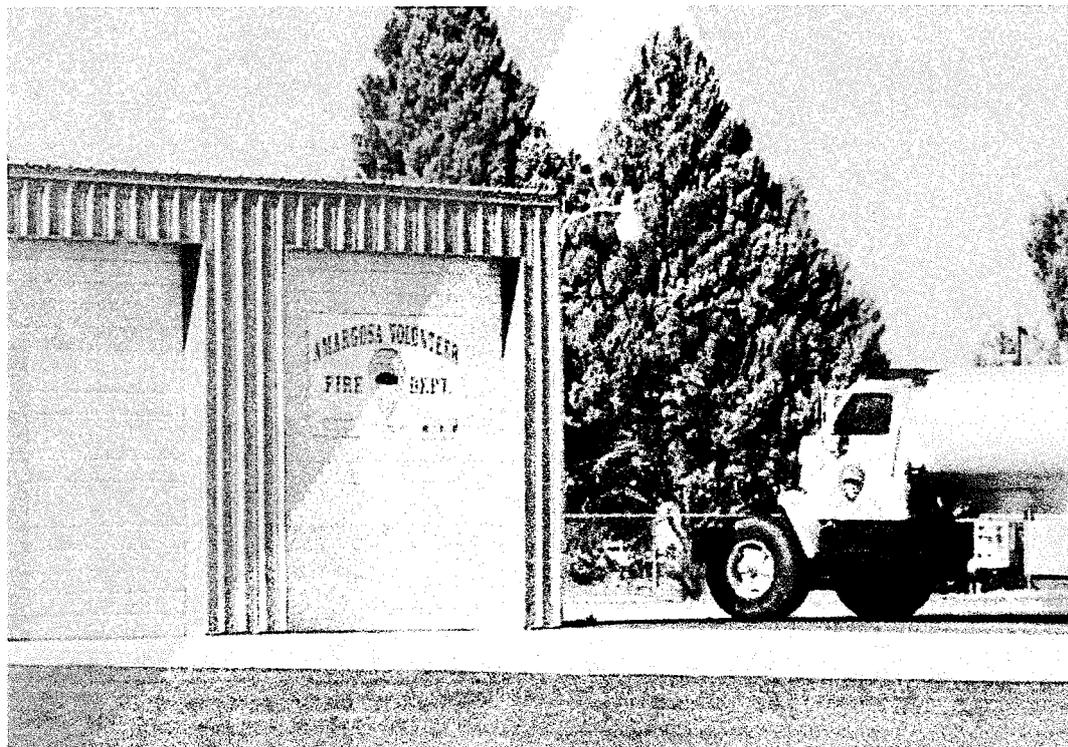
of mineral oil burned. "Huge flames and black clouds roiling into the night sky," she wrote. Firefighters had to wear gas masks to avoid the toxic fumes.

Solar Millennium will use a new higher temperature heat transfer fluid — a eutectic mixture of biphenyl-diphenyl oxide (Therminol VP-1 or Dowtherm A). In recent years, a new indirect thermal energy storage (TES) approach has been developed. This approach takes advantage of the experience with the storage system used in the Solar 2 — a molten-salt power tower demonstration project — and integrates it into a parabolic trough plant with the conventional heat transfer fluid through a series of heat exchangers. The thermal energy storage system is charged by taking hot, heat transfer fluid (HTF) from the solar field and running it through the heat exchangers. Cold molten-salt is taken from the cold storage tank and run counter currently through the heat exchangers. It's heated and stored in the hot storage tank for later use. Later, when the energy in storage is needed, the system simply operates in reverse to reheat the solar heat transfer fluid, which generates steam to run the power plant. It's referred to as an indirect system because it uses a fluid for the storage medium that's different from what's circulated in the solar field.

Several parabolic trough power plants under development in Spain plan to use this thermal energy storage concept. For future parabolic trough power plants, a number of alternative approaches are being considered for reducing the cost of the thermal energy systems. A two-tank indirect thermal energy storage system is relatively expensive — its primary disadvantage. The expense is due to the heat exchangers and the relatively small temperature difference between the cold and hot fluid in the storage system (source: [National Renewable Energy Laboratory](#)).



^A fire investigator looks over the burned out remains of the fuel tanks (Photo by [Lara Hartley](#))



^Amargosa Valley's volunteer fire department. Residents say this would not be able to handle chemical fires of the type that Daggett experienced.

Material Safety Data Sheet (source: www.energy.ca.gov)

Product name: **ENERGOL® VP1** Heat transfer fluid, synthetic oil in the pipes collecting heat from the parabolic trough reflectors.

FIRE FIGHTING MEASURES:

Fire point: 127 C

Hazardous products of combustion: carbon monoxide (CO); carbon dioxide; hydrocarbons.

Extinguishing media: Water spray, foam, dry chemical, or carbon dioxide.

Unusual fire and explosion hazards: None known.

Fire fighting equipment: Firefighters, and others exposed, wear self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.

Miscellaneous advice: This product is not classified as a fire-resistant heat transfer fluid. Precautions to avoid sources of ignitions should be taken. Precautions against ignitions and fire should be taken with this product. Chronic exposure has been reported to cause headache, fatigue, nausea, indigestion, abdominal pain, tremor, central and peripheral nerve damage and liver injury.

Environmental Toxicity to Fish: Rainbow trout (*Oncorhynchus mykiss*) 7.6 mg/l (lethal); Fathead minnow (*Pimephales promelas*) 24 mg/l (lethal).

DISPOSAL CONSIDERATIONS:

US EPA RCRA Status: This material when discarded may be a hazardous waste as that term is defined by the Resource Conservation and Recovery Act (RCRA), 40 CFR 261.24, due to its toxicity characteristic.

Department of Energy Sandia Laboratory Tests on Therminol:

(Source: THERMOCLINE THERMAL STORAGE TEST FOR LARGE-SCALE SOLAR THERMAL POWER PLANTS, publication on U.S. Department of Energy, Office of Scientific and Technical Information:

<http://www.osti.gov/bridge/servlets/purl/761869-hh1dP8/webviewable/761869.pdf>

"[Image] Solar Two, an example of a Central Receiver Solar Power Plant. Central receiver power plants, often referred to as power towers, use molten nitrate salts as their heat transfer fluid. Surrounding the tower are thousands of slightly-concave sun-tracking mirrors called heliostats. The receiver is located at the top of the tower. All the heliostats reflect and concentrate the sunlight onto the receiver. At Solar Two the molten salt experienced temperatures between 290°C and 560°C. Solar Two was a 10MW, test solar power plant that was connected to the power grid in Southern California. Southern California Edison (SCE) was the head of a consortium of utilities that demonstrated Solar Two with SNL and the DOE. Solar One was the first large-scale central receiver power plant to be constructed and tested. It was located at the same site as Solar Two. The difference was Solar One used a water-steam receiver and an oil-rock thermocline storage system. Solar Two substituted molten salt as the heat transfer fluid instead of water and also molten salt as the storage medium instead of the oil.

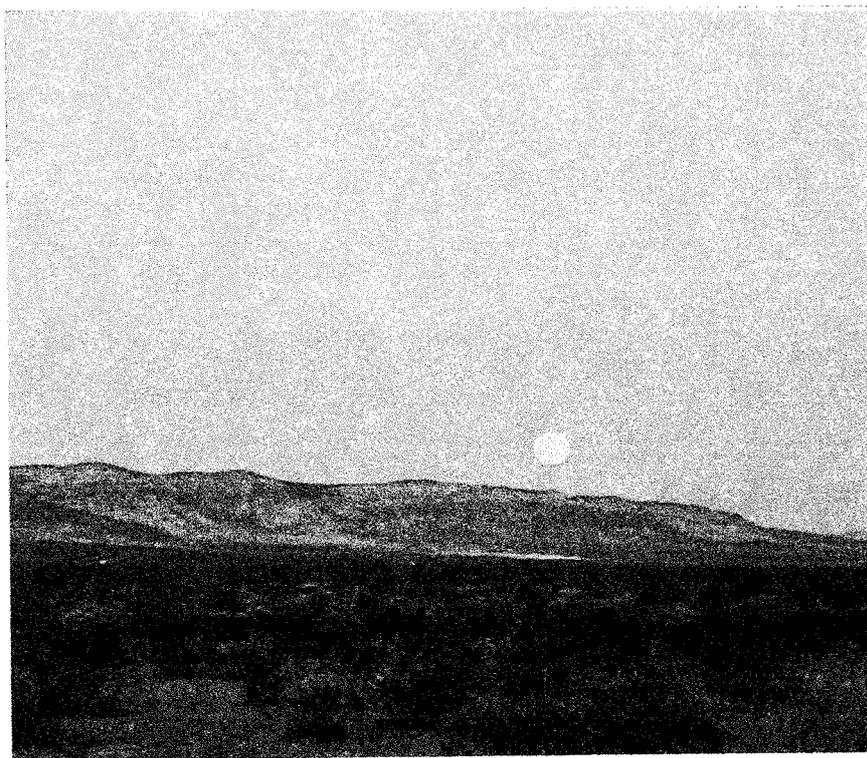
"[Image] Solar Energy Generating System (SEGS) four through seven, an example Parabolic Trough Solar Power Plants. These plants are more commercial than central receiver power plants. In the mid-1980s SCE signed a thirty-year contract to buy electricity from nine SEGS plants that would be constructed. An Israeli company called Luz developed the majority of the technology for these parabolic trough power plants. SNL did some supportive testing. Today these plants are connected to the utility power grid and serve tens of thousands of homes and businesses in Southern California. Construction of the SEGS power plants began in the mid-1980s and finished in the early 1990s. [Image] Heat Collection Element (HCE), a sun absorbing tube. The heat transfer oils travel through this tube and heat up due to the concentrated sunlight. These plants consist of many rows of parabolic-shaped mirrors to concentrate sunlight onto a tube that runs along the focal point of the mirrors. Temperatures in SEGS Two-Nine reach 390°C, and the heat transfer fluid is a synthetic oil called Therminol. In SEGS One a mineral oil called Caloria is used as the heat transfer fluid. The SEGS One plant runs its power cycle at temperatures of 220°C and 310°C. In SEGS One there are two tanks that provide some storage for the power plant. These two tanks house the heat transfer fluid, Caloria. In SEGS Two-Nine there is no storage because Therminol can reach higher temperatures than its Caloria counterpart at SEGS One. The power cycle temperatures at SEGS Two-Nine are 290°C and 390°C. The higher temperatures yield a higher efficiency in the steam turbine. Additionally the Therminol boils at 260°C and atmospheric pressure. Thus, it must be pressurized. The cost of a pressurized storage tank is not practical in the SEGS Two-Nine plants.

"Solar Two used a two-tank system. There was a hot tank 560°C filled with just molten salt, and a cold tank containing molten salt at 290°C. The molten salt was used in Solar Two because it can reach higher temperatures than the mineral oil, Caloria, used in Solar One. The molten salt can reach 560°C whereas Caloria's peak temperature is 310°C. A higher temperature yields a more efficient cycle, thus the substitution of molten salt for mineral oil made sense. One of the largest challenges for large-scale solar thermal power plants taking off commercially is their large cost compared to the cost of conventional power plants such as coal. Currently, the average coal power plant produces electricity for a cost of \$0.02-\$0.04 per kWh. Solar power plants produce electricity for a cost of \$0.12 per kWh....

"**Salt/Oil Safety Test:** This test explored the reactivity between Therminol and Caloria, and the molten nitrate salt. The molten salt used in this test was a commercially available mixture of 48% CaNO₃, 7% NaNO₃, and 45% KNO₃. Its freezing point 87°C – 130°C. This mixture is sold under the name Hi-TEC XL. The composition of these molten nitrate salts can be altered without much change on its material properties. For example, this Hi-TEC XL would behave very much the same in metal heat treating processes as would a mixture with different

concentrations of CaNO_3 , NaNO_3 , and KNO_3 . The factor that varies with changes in the concentration of the constituents is the melting/freezing temperature. Therminol and Caloria are currently used as the heat transfer fluids in the SEGS solar trough power plants in southern California. Therminol is a synthetic oil; Caloria is a mineral oil. Since the intention of the thermocline is to provide thermal storage for the Solar Trough power plants, we needed to investigate the reactivity between the oils used in the SEGS plants and the molten salt. It is possible that the oils could come into contact with the molten salt at the operating temperature of 400°C due to a failure in the oil-to-salt heat exchanger. The subsequent reaction could cause a dangerous result such as a fire or explosion.

"The Therminol caused rapid bubbling and steaming when introduced into the salt. Bubbling continued for one minute and twenty seconds until the Therminol was completely boiled off. The bubbling is desirable because a failure in a Therminol-to-salt heat exchanger could be detected with a sensing mechanism that identifies a pressure rise. There were no flames. The Caloria caused similar result as the Therminol. It bubbled and steamed for three minutes before all the Caloria was boiled off. Again this was satisfying because we witnessed no flames or explosion. After the Caloria boiled off we surrounded and covered the beaker with insulation in order to maintain the temperature of the salt at 400°C for the next experiment. Immediately upon covering the beaker we saw flames seeping through the gaps in the insulation. Right away we removed all the insulation from the beaker. The surface of the salt maintained the flame for just over two minutes. The flames we saw in the Salt/Caloria safety test motivated us to repeat the salt/Therminol safety test, but this time implementing a spark plug in the headspace of the beaker. The Caloria vapors, mixed with oxygen from the air, caught fire when trapped by the insulation. Perhaps the Therminol would have reacted the same way had it been covered in its original test. The objective of this test was to determine if containing Therminol vapors and providing a spark would cause the vapors to ignite. The Therminol vapors did ignite. Thus we deduced that if the temperature is above the boiling point of the oil (260°C for the Therminol and 320°C for the Caloria), then oil vapor will be present. If this vapor is contained and oxygen is available, then the oil vapors can ignite. If salt storage systems are to be incorporated into the Solar Trough power plants, care should be taken to monitor the oil-to-salt heat exchanger in case of a leak. **A fire could result.** One positive note was that both the Salt/Therminol and Salt/Caloria safety tests showed no signs that an explosion would occur. The flames in both tests ceased after a few minutes. The oil vapors just needed to burn off."



^Full moonrise over Amargosa Valley.

Amargosa Valley - Solar Millennium

Explosion Dangers of Solar Thermal

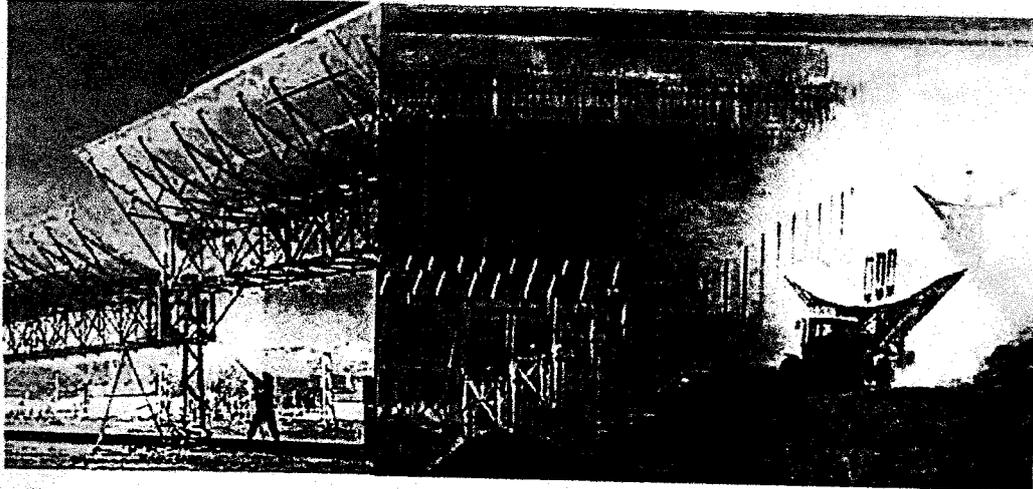
At the Bureau of Land Management scoping meeting held August 18 in the town of Amargosa Valley, Nevada, we were handed these sheets by a local resident. She told us she lives a mile from the boundary of what would become a huge industrial solar thermal power plant using parabolic trough mirrors that collect heat from sunlight in tubes containg the synthetic oil Therminol. In 1999 a similar solar plant using a similar heat transfer oil exploded, causing a large fire. Residents of Amargosa Valley worry a similar accident could endanger their school, town, and residences. See our story on the BLM scoping meeting >>[here](#).

section 6
pg 11
exhibits

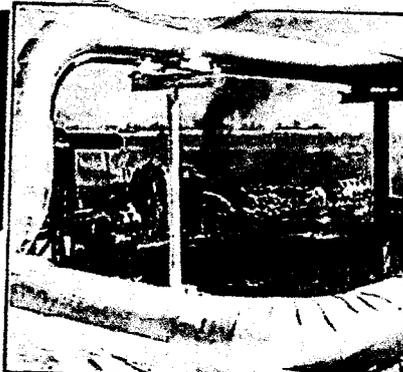
SOLAR POWER PLANT EXPLOSION

"Massive explosion shook the plant and surrounding area"

*Photos from Solar Millennium's annual report, (Pg. 44)
Example of Solar Millennium's dust abatement.*



A fire burns out of control at the Sunray Inc. solar plant in Daggett, CA after a massive explosion shook the plant and surrounding area. This photo ran five columns on Saturday morning in both the Desert Dispatch and the Daily Press.



The fire still smolders and burns more than 14 hours after it started. Photo By Lara Hartley



Firemen talk with company officials during the fire in which 900,000 gallons of a mineral oil burned.

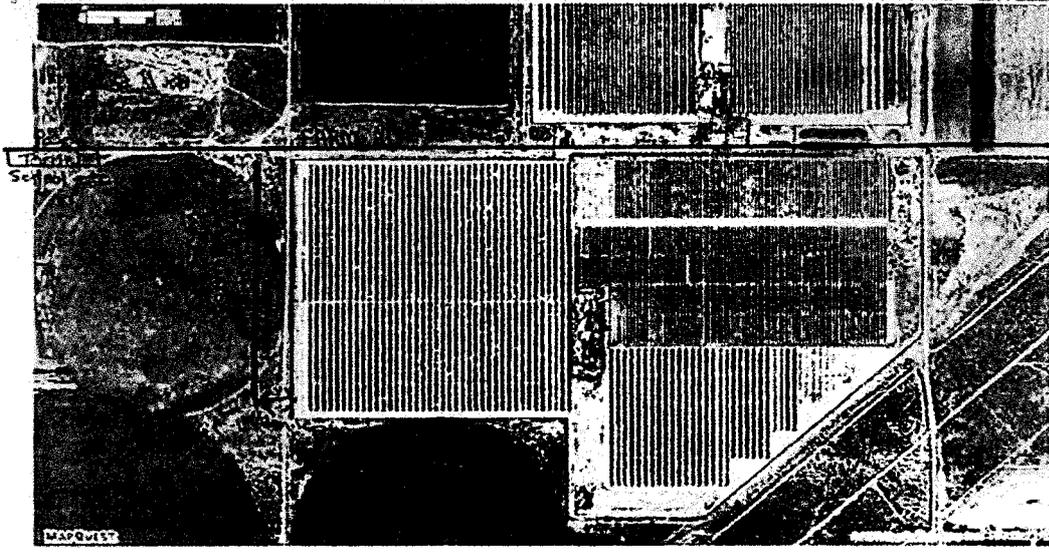
*Massive explosions - burning
toxic oil fumes - fire spreading
inevitable destruction and
deaths for surrounding
residents and our town.*

*BLM allowing Solar Millennium
to build this or any similar
dangerous plant anywhere
within 5 miles of our town
or homes is insane!*



A fire investigator looks over the burned out remains of the fuel tanks. Photo By Lara Hartley

THIS IS THE PLANT THAT EXPLODED BURNING 900,000 GALLONS OF TOXIC OIL

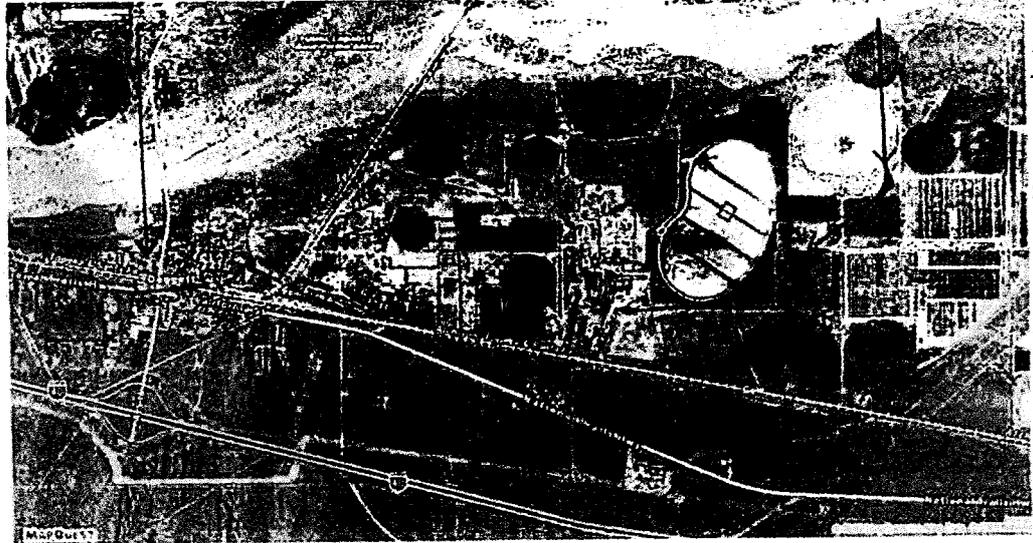


Above photo is a blow up of the solar plant below

USING THIS SOLAR PLANT IN DAGGETT CA. AS AN OVERLAY TO THE AMARGOSA AREA WE CAN SHOW WHERE THE AMARGOSA TOWN AND SANDY LN. ARE LOCATED IN RELATION TO THE PLANNED SOLAR MILLENNIUM PLANT.

OLDEST SMALL TOWN AND RESIDENTIAL AREA IS 3 TO 4 MILES FROM SOLAR PLANT IN DAGGETT CA

THIS DOT IS WHERE AMARGOSA TOWN CENTER AND RESIDENTIAL AREA WOULD BE RELATIVE TO SOLAR MILLENNIUM PLANT



THIS IS THE PLANT THAT EXPLODED WE WOULD BE DEPENDING



HOME.....Solar Millennium Scoping Meeting 8-2009.....Solar Millennium Meeting 5-2009

This section is a list of Questions that pertain to all the “Hearing Exhibits” for Hualapai Valley Solar Project dated January 2010. For submittal to:

Arizona Power Plant and Transmission Line Siting Commission.

It has been broken down by the sections and page numbers as are in the Hearing Exhibits binder.

The Applicant shall make all reasonable efforts to minimize the use of groundwater during construction and operation of the Project and use for cooling and all other non-potable water uses effluent to the extent it is made available by the City Of Kingman from its Hilltop Waste Water Treatment Plant and can be transported to the Project site. The Applicant may utilize groundwater for potable uses and as a back-up to effluent when effluent is not available from the City of Kingman or when transmission of the effluent is interrupted from the Hilltop Waste Water Treatment Plant to the Project. Total water use shall not exceed 3,000 AF of acceptable quality water, on an average annual basis.

#20. ... The Applicant shall notify the Arizona Corporation Commission in writing of the type of solar technology, the number and nameplate rating and fuel type of all generators, if PV, whether crystalline silicon or thin film and whether fixed or single axis trackers are to be used, and which Gen-Tie option and which transmission line interconnection will be used. Applicant shall require its EPC contractor to report the total number of its employees, as well as the number from Mohave County and the State of Arizona.

Page 2, Line 14 <insert>

The Arizona Building Trade Council was represented by Israel Torres of the Torres Consulting and Law Group, LLC, and provided a presentation pertaining to the Arizona construction trade unions and available manpower to build the proposed Project with local construction workers.

Page 8, Line 20 <insert>

23. Applicant shall make good faith efforts to continue to partner with Mohave County workforce development personnel on job training and/or apprenticeship programs for Mohave County residents and to encourage its contractors to utilize qualified local construction workers to construct the Project, as noted in Mr. Bartlett's testimony (pages 23:19-27:9).

24. Within ninety (90) days of the Commission decision granting this Certificate, the Applicant shall make good faith efforts to commence discussions with the Arizona Building Trades Council on how to encourage the utilization of qualified local construction workers for the construction of the Project.

Questions on Hualapai Solar Exhibits

Section : Applicants notice of filing:

- 1) Hualapai Valley Solar published their notice of filing: The page shows all of Section 21 is included, is this correct?
- 2) But the resolution passed by the Board of Supervisors states lots are excluded in Section 21.

- 3) It appears that Hualapai Valley Solar published the notice of filing incorrectly?

Section 4: Direct Testimony of Greg Bartlett

Page 2 You indicate your business address as: 85 Hamilton Street, Cambridge, MA

- 1) Is this correct?
- 2) Are there any other business / corporations that you are involved with at this location?

- 3) Can you provide the names of these Companies Mr. Bartlett.

- 4) You state that you are the Managing Director and Co Founder of Mohave Sun. LLC, the parent company of Hualapai Valley Solar? Is this correct?

Page 3 You indicate that you are a Hughes Scholar, published writer.

- 1) Can you tell us the name of the books you wrote?

Page 5 You indicate Mitchell Dong is Executive Director, of Mohave Sun LLC, and Hualapai Valley Solar, LLC. Is this correct?

Page 6

- 1) Is Mitchell Dong involved with other companies, other than what is indicated.

- 2) Is Mitchell Dong owner of Chronos Assest. Management Inc?

Page 12 Photo voltaic mentioned

- 1) Your application with Mohave County for this project was for a Concentrated Solar, is this correct?

- 2) Why are you indicating now Photo voltaic?

Page 13

- 1) No active residential development. Have you taken under consideration Rhodes at Red Lake?

Page 14: WWTP – Hilltop

- 1) The waste water treatment plant is 40% completed to date. How many gallons per day do they make right now?
- 2) Will their Federal Grant regulations prevent you from getting the water?
- 3) The water was granted for golf courses & recreation first was it not?
- 4) All of the waste water is evaporating?

Page 15

- 1) Have you reviewed the Grant application made to the government for the construction of the waste water treatment plant?

- 2) Are there water use restrictions on those grants?

Page 16

- 1) There are not enough sewers to provide the effluent needed to HVS. Many of the homes in the area are on septic, not sewer.

- 2) Also many of the homes in North Kingman are new, the grandfather clause would take over & preserve septic systems for years.

Page 19

- 1) Wouldn't the alternative connections prevent Arizona receiving the electricity?

Page 28

- 1) You indicate a Visitors Center. Which site route access do you plan on using to get to this center?

- 2) **You have stated that this project will add the County in attracting and promoting projects that generate renewable energy. Breaking the county's mandate for 'No Water' cooled power plants sets a precedence for others to sue if not allowed.**

Section 4

pg 31

1) How many letters of protest against the project were received?

pg 32

1) ~~What~~ What is the name of the local water utility that ~~is~~

2) Is this the Neal Family?

3) These are the same water companies that are under investigation by the ACC and also ADEQ

pg 33

1) Photovoltaic confirms to Mohave County General Plan 3.5 Concentrate Solar Plants do not is this correct?

Section 5
Refer to Labor Status

Section 6 Mike LaRow

pg 2

1) What is Miter Inc?

2) Who owns it?

pg 4 How long does it take these mirrors and oil tubes to cool?

Section 6

pg 5 Is it true where the water
 * D⁺ droplets hit the hot pipes &
 the TDS to particulate matter?

2) The TDS as of 12/30/2009 in
 project area was 1559/772
 parts per million.

3) ~~Bats will sonar in on them~~
~~Bats will sonar in on them~~
~~Bats will sonar in on them~~

pg 6 Rhode @ Red Lake Housing
 Development

1) ADWR states water available.
 Are there any other water studies
 that you referred to?

pg 6

response

pg 8 DOE (Water to Dry Cooled)

1) Would the 5% loss not be off set by the .64¢ per 1000 gallons of effluent, and the 20-30 miles of pipeline to be installed and the up keep of the pipes?

pg 10

Did the P&Z and BAS consider water usage, and the mandate that states "No water" cooled plants. Why not?

Are you in a fire District?

Pg 11 SEGS (Dage + CA)
Segis I exploded did it not?

2009 Segis II is closed & being dismantled

* And yet you are using the same
proven technology on top of a salt
bed

Pg 12

D

~~IS A TRUE~~

If a Photovoltaic cost's less
than a wet cooled CSP why
not ~~make~~ make HUS Photovoltaic
and the money saved can be
used to pave Antares Rd
as the alternative route?

Section 8 William Victor

1) Who paid Montgomery and Associates?

pg 2 ① Are you not the same Co. that
pg 3 worked on the "Prozada"
~~Sub~~ Subdivision by Developer
Jim Rhodes in Golden Valley
~~located~~ located on the Sacramento
Aquifer?

2) Did your Co. / Firm work on
Griffith Energy on the I-40
Corridor?

Total time for
assumed ~~###~~ ||
estimate ~~###~~ ||

~~###~~
~~###~~
⑤

pg 5
1)

The city of Kingman is located
in the Hualapai Aquifer, is this
correct?

pull
my
reference

~~###~~ ~~The Desert Community has~~
~~wells correct?~~

pg 7
to pg 7

IS the groundwater flow's
North into Lake Mead. IS this
~~###~~ contributing to Lake Mead's
Decline?

Pg 7



2) If Kingman well fields are in depletion and water flows North, if ~~and~~ thus sinks the proposed wells they require, will this also contribute to Lake Meads Decline



3) Mr Victor in ~~your~~ your section you have used the word assumed 7 times. Do you have any facts to clarify your assumptions?



More Pg 7

pg 7

4) Mr Victor you have also used the word estimated 7 times. Do you have facts to clarify your estimates.

pg 9 ~~Mr Victor is it not true that the USGS report on the ^{ground} ~~water~~ ~~in the Hualapi, Sacramento and Del Norte Aguilars is done.~~~~

1) Mr Victor you state that the Kingman wells increased at a 3% rate. Yet Kingman's growth has been at a higher %.
Did you take this into consideration?

pg 10
1) You make reference to the Hwy 93 Corridor Area Plan?
Are you aware this was tabled at the request of ADOT and another Concentrated Solar Facility

pg 11
1) ADWR has the ability to take HUS committed Demand into account. Did you take into consideration the Rhodes / Mandrian Subdivisions completions?

2) Is it fair to say that it would be Hualapi Valley 1st, Rhodes and Mandrian 3rd in who

pg 11 continued

gets water?

- 3) Then what happens to the individual parcel owners, they can't ~~split~~ ~~split~~ split their land because they don't have the water? ~~split~~ ~~split~~

Section 10 environmental

- 1) Mailer notices sent to property owners within one mile of the project. About how many residents are within 1 mile of the project?

pg 8

RDA Designation - Yet Jim Rhodes is projecting an urban land use with small lots - Yet none of these land splits have occurred is this correct why?

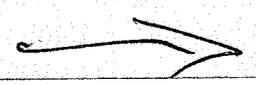
pg 9

Has the infrastructure been planned

1) by Mohave County within the next 5 years. - for proper infrastructure for Industrial Development?

* Supervisor Gary Watson said NO! No plans now or in the future.

2) Or is the Mohave County taxpayers picking up the tab yes or no



Pg 9
#14

3) Does Mohave Sun own all of Section 21 in the proposed project area?

Pg 9
is this correct

4) You state that there is no local, state & federal developments in the vicinity? ~~Yes that is~~

~~to miles to the north Phase II of a proposed water farm.~~

Yes or No?

- 5) Yet 6 miles to the North of the vicinity is Phase II of a proposed Wind Farm.
• Why did you not consider this

Section 12

pg 3

- * 1) ~~While~~ While you are working on this project - who signs your checks? (pay stubs?)
DOE?
WAPA?
BLM?

pg 4

- 1) Were you ever there at the proposed site at dusk?
Like 6pm or 7pm
yes or no



pg 4

* 2) Did you complete your survey prior to this hearing?

3) How many bats did you see out at ~~the~~ proposed Hualapi Valley site?

pg 5 Cooling ponds

1) Do you understand that sitting water attracts the "Mohave Green" snake and other ground species? They will smell this water for miles

pg 7
D

Will there be much glare from these mirrors?

A) Your Demo shows a section of glare.
IF this is glare, is the rest of the project's glare understated?

pg 8

1)

The NEPA application is not done, and this hearing is premature and the findings are unstable - is this correct?

Section 15

Signed Memorandum of Understanding

1) Mr Bartlett on Jan 4, 2010
were you at the Attorney General's
office for a pre-hearing
yes or no

2) ~~was~~ The meeting lasted from
approx 3⁰⁰ - 4³⁰
correct
yes or no

3) So when did you sign the
memorandum of Understanding?

4) - The City of Kingman ~~at~~ City
Council executive session @ 6⁰⁰
only approved the Memo of
Understanding

see
Deering
on this

Did the mayor sign then?

Section 17

- BOS resolution excludes parcels in Section 21
Why did you publish in 2 newspapers an inaccurate ~~design~~ notice

- Resolution also uses ~~Smart Growth~~ (ARS 11-823 C-3)
Growing Smart as in the 3.5 of General Plan