

Cloud Seeding Instructions –November 1, 2008 – Northern California-Pacific Gas & Electric Company

Greetings!

Cloud seeding activities commence on November 1, 2008 for both Lake Almanor and Mokelumne watersheds. These programs are two of a large number of winter-season weather modification programs which operated last year in California.

PG&E will commence cloud seeding operations on the Pit- McCloud Watershed this year also. Details on that program and seeding instructions will be provided to you shortly.

The key technical contacts remain the same:

Phil Benning (PMB1) is the contact for the Mokelumne Cloud Seeding Program.

Robert (Bob) Hammill (RMHd) and Steve Tissot (SDT3) are the contacts for the Lake Almanor Program.

Please ensure that you send them an e-mail any time you initiate a seed. This keeps them "in the loop".

There are no changes in the Lake Almanor Program this year; however, there are some significant changes in the Mokelumne Program this year:

We added two new seeder locations - Tamarack and Osborne Ridge. We now have a total of seven seeder locations for the upcoming season.

The seven sites are identified as follows: RTU #51-Tamarack , RTU #52-Hermit Springs , RTU #53-Big Meadow , RTU #54-Black Springs , RTU #55-Cole Creek, RTU #56-Upper Bear, and RTU #57-Osborne Ridge. Due to the change in location of the seeder sites relative to the Salt Springs Watershed, the seeding sectors are modified this year. South is now defined as the sector from 150 Degrees to 225 Degrees, Southwest is now defined as 226 Degrees to 250 degrees; Northwest is defined as 251 degrees to 325 degrees.

The project binders are assembled and are now in the Weather Office. With every seeding order, please enter the appropriate data into the Cloud Seeding Order Form and complete a Record of Operating Orders Form. The Record of Operating Orders Form is filed with all supporting meteorological data (see below) in the back of each binder.

Please note in the Lake Almanor Operating Instructions that - similar to the change we made last year - at least one rawinsonde observation is required during each seeding period. Regarding the rawinsonde at Prattville, Steve Tissot and Bob Hammill at Prattville will both fax the data as they have done in the past and will also e-mail the detailed rawinsonde data files to the weather office. Another meteorological reference point is the new PG&E site at Hatchet Mountain near Burney. A heated sonic anemometer is installed on an 80-foot communications tower at the PG&E Communications facility. These data are available via the Campbell Scientific PC208W software.

The meteorological data for the Mt. Reba Tower (Mokelumne) can be viewed via the forecaster console using the Campbell Scientific PC208W software or go to:

http://store.bearvalley.com/bear%20Weather/public_html/weather/public/hourly.htm .

There is a "Cloud Seeding Worksheet" on the PG&E Weather Office Web Page. The cloud seeding worksheet provides the links you need to gather data and send notifications of seeding events to Phil Benning (MOK) and Steve Tissot and Bob Hammill (ALM). The Forecast Soundings Option is a good tool for determining when to start a seed during the overnight hours after the Wx Office closes.

Please use the seeding decision matrix and your judgment to order the burners on via the Tiger Creek Powerhouse or Caribou Powerhouse operators. Keep in mind that you can order a seed to start both during Weather Office work hours (0500-1500) and, in your judgment, during the hours when the office is not staffed (i.e. overnight) if conditions are forecast to meet the decision matrix criteria. For Lake Almanor, when you issue a seeding order, you should anticipate that conditions will remain conducive for seeding for a continuous 12-hour period. Due to the changes in wind direction sectors for Mokelumne, a shorter seeding period than twelve hours is acceptable.

When you issue an order for cloud seeding to either Caribou (Lake Almanor) or Tiger Creek (Mokelumne), please follow each order with an e-mail message to Steve Tissot (sdt3@pge.com) and Bob Hammill (RMHd@pge.com) for Lake Almanor and Phil Benning (PMB1@pge.com) for Mokelumne. We want to notify them so they can double check the burner status of the seeders and also address any communications issues that may occur between the Control Room and the individual seeders. The message sent to them should be simple, such as: "Seed Order SW-1 was issued at 0800 LST today. The seeders were ordered on from 1000LST today until 2200LST tonight".

For each seeding event, it is important to assemble data that supports your decision and shows observed weather conditions. We do file a report with the Office of Atmospheric and Oceanic Research, NOAA, by February 15th and July 15th each year. Having these data makes it easier to address any questions that may arise.

As a minimum, please obtain and save the following for each seeding event:

- 1) The upper air soundings (text format) for those time periods used to make the seeding decision and concurrent with the seeding operation. For Lake Almanor, please save the Medford (MFR), Oakland (OAK), and Reno (REV) soundings. For Mokelumne, please save the Oakland (OAK), Reno (REV), Vandenburg (VBG), and Desert Rock (DRA) soundings.
- 2) Visual and IR satellite pictures at time periods during or as close to the time of the event.
- 3) Tabular rainfall summaries for Northern and Central California.
- 4) The large-scale 24-hour total precipitation summary maps for Northern California.

We would also encourage you to save any other information you think is appropriate.

If you have questions, please refer them to Byron or I.

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