

GEOTHERMAL PUBLIC HEALTH ASSESSMENT JOINT FACT FINDING GROUP

STUDY GROUP – 2ND MEETING

February 10, 2013

1:00 – 5:00 pm

Hawaii Academy of Arts and Sciences

Members in Attendance

Jay Bondesen
Al Dettweiler
Dan Domizio
Jim Haefner
LaRee Hiltner

Robert Petricci
Rene Siracusa
Jeff Sutton
Laura Travis
Tom Travis

Also in attendance for portions of the meeting were community members who were invited to ask questions or offer comments at the end of the meeting.

Agenda Items

1. Observations from clinicians
2. Discussion of complaints, claims, allegations
3. Initial discussion on future health studies
4. Comments from community members

MEETING SUMMARY

1. Clinical observations

Doctors Janet Sherman, Sam Ruben, Kaye Kilburn, Charles Dundas, and Dan Domizio offered their experiences and observations on health issues, both in general and as they believe may be linked to geothermal energy production in Puna. Drs. Ruben and Sherman treated patients following the well blowout in the early '90s. Dr. Domizio is a public health specialist and physician's assistant in Puna. Dr. Dundas directs clinics both in Puna and elsewhere.

Dr. Ruben worked for DOH at the time of blowout and saw complaints that included respiratory problems, skin disorders, and stress. He stated that the DOH should have records. Ruben noted that evidence of effects from chronic exposures is confounded by exposure to volcano emissions but was concerned about not having buffer zone on stress and noise. He noted previous studies by Dr. Bruce Anderson and a CDC study on VOG.

Dr. Sherman worked in Puna for 20 years and has done several studies which are in the NIM archives. DOH should also have copies. She asserted that the

connection between observed symptoms and H₂S have been known for decades. Similarly, so is the connection between stress and noise. She stated that the highest priority study would be whatever is recommended by Dr. Kilburn.

Dr Kilburn, who was in town and available to the Study Group, stated that modern health studies have developed elegant ways to measure mental function degradation which is the primary effect of many toxins, including sulfur. He believes a boundary for any study would need to be farther than 5 miles to capture possible effects. Of all sub-populations, he believes babies in utero are likely the most affected, next school children, then older folks that have gotten long term exposures. Dr. Kilburn was not clear as to whether it was necessary to differentiate between sulfur compounds.

Dr. Domizio has spent 12+ years in the community and noted that all manner of problems come in the front door of the clinic for diagnosis and treatment. He noted no specific out of the ordinary patterns to health complaints, except those from Warm Ponds. Although difficult to recognize a pattern, as a clinician he thinks most complaints attributed to PGV have tended to be attributed to noise.

Dr. Dundas coordinates five clinics, including the one in Pahoā. He reviews thousands of charts but does not often see patients directly and has seen no pattern that he would attribute to geothermal energy production or any other pattern indicative of a cluster. He believes VOG is a confounding factor and suggested that any study would need non-VOG and VOG and PGV and non-PGV controls to be valid.

In the discussion that then followed, it was pointed out that lower Puna has lower VOG levels than upper Puna or Hilo and that control groups for studies might be Hamakua and Waimea. Dr. Kilburn responded to a study by Guidotti which questioned the quality control of some of his past studies. Guidotti referenced two studies that cited lack of repeatability in finding diminished brain function as a consequence of chronic exposure to sulfur based chemicals. Dr. Kilburn handed out a suggested list of physiological and psychological tests to measure brain functions and suggested that measurements that are more reliable may lie in cognitive brain function analysis. Dr. Kilburn also noted that brain function tests could be faked, but attempts to do so were obvious.

Concerns about the lack of good exposure data were raised. The group's recommendations can include suggested monitoring improvements which could be linked to recommended studies or simply stand alone to strengthen ongoing data capture. One participant pointed out that after years of reading 3-5 ppb on his own monitor, it now reads zero. Some of the ensuing discussion centered on the aftermath of the 1991 blowout which involved acute exposures to noise and H₂S.

2. Health conditions, complaints, and claims

Keala Carter summarized the information she had gathered on health conditions and complaints she reviewed from Council testimony, DOH records, and records at PGV. Some members of the Study Group believe these complaints from the records are the proverbial tip of an iceberg and many more remain unreported or un-gathered. Other sources exist: inventories done by the women's health group and those being gathered by Puna Pono. Anecdotally, these include skin disorders, pulmonary problems, reproductive problems, stress issues, birth defects, pediatric problems and neurological disorders. Many of these are cumulatively attributed to geothermal energy production starting with the first experimental geothermal well, HGP-A, and continuing through the blowout, and on to PGV's post-blowout operations.

A few early health studies done some 20 years ago after the well blow-out in the early 1990s may still be available through the Department of Health and the National Library of Medicine in Bethesda. Puna Geothermal Venture is required to make reports every six months. They submit these to the Planning Department and to the Department of Health. Historical records may not be complete and are often hard to locate and heavily redacted to protect individual confidentiality. The most current state health surveillance data, State of Hawaii Primary Care Needs Assessment Data Book 2012, can be found at <http://Hawaii.gov/health/doc/pcna2012databook.pdf>

In the discussions that followed, it was noted that the residues from the experimental HGP-A operations have not yet been addressed or mitigated and that the PGV operation is adjacent to the original site. Pictures were circulated showing the encrusted dry pond beds and dead surrounding vegetation. One member of the Study Group raised the question of whether the area has been investigated as a possible superfund which could be contributing to health problems. Most attendees seemed unaware of the site's existence.

Several members of the Study Group have been doing their own review of health complaints, identifying the various nature of complaints and how the complaints were made. Some of these are lodged in law suits that were filed against PGV and then settled. In the discussion that followed, the group concluded that there have been many complaints and some of the complaints may be valid, especially those post-blowout. However, the Study Group agreed to take complaints as an assumption and move forward to discuss possible studies that could validate and give insight to the sources of possible health harms.

3. Defining “health”

In the face of different complaints and assertions against geothermal energy production operations, the Study Group generally believes technical and scientific studies have been insufficient and not received enough government attention. Some of this may be due to the challenges that must be confronted to obtain reliable empirical data and effective remedies and oversight. Some expressed concern that this particular Study Group's recommendations and any future health study may experience the same lack of responsiveness as has

happened in the past. Others, however, are more optimistic that the group's work will be well received. The Study Group then briefly discussed the need for some kind of working definition of health. A general consensus was reached that the World Health Organization's overall definition was too broad to be useful and that whatever definition is used, it needs to be sufficiently broad to include the consequences of noise, stress and other possible cause-effect linkages.

4. Initial thinking on studies

The Group's final discussion of the day focused on each person's initial ideas on the kinds of studies we may ultimately recommend. Ideas included recommendations for:

- An improved and more comprehensive and long-running monitoring of exposures over time.
- A review of the HGP-A site to see if environmental contaminants remain.
- A Kilburn-type study of noise, stress, and exposures to gases and heavy metals
- A water survey all the way to the ocean.
- A possible study of site improvements and monitoring
- A cross-sectional study of the community, then a longitudinal study with comparable analysis from other areas.
- for comparable analysis.
- The identification of health effects and ties to causes with recommendations for community protections.

Any study, it was stated, must be statistically valid, have careful controls, and must address challenging social-economic issues.

COMMUNITY COMMENTS

- Government has failed. Without government taking its appropriate role, the problem cannot be fixed.
- Call California, see how they do it, and adopt their management and safety programs.

- A policy for health and land regulation plus enforcement that is trusted by the people.
- The plant is simply in the wrong place
- Noise is a fact
- Changes in off-shore marine life have been noted. Is there a loss of marine life linked to PGV? We are losing marine life
- Mediation does not work
- Wao Kele O Puna has not been cleaned up.
- Effects from PGV are greater than 10 miles
- PGV supports the health and welfare of the community and has begun an improved website where exposures can be tracked.
- Need good water testing
- Noise is always there and there is a lack of data
- We need a study that determines the impact to see if it is consistent with the permitting conditions, which says “no significant impact on the public.”
- We need an appropriate buffer zone
- The plant needs to be moved

The meeting concluded after 45 minutes of community comments until all who chose to speak were heard. Video and audio tapes of the entire meeting were conducted and the video will be uploaded to YouTube with a link forthcoming.

COMMENTS ON MEETING SUMMARY

- From Rene Siracusa: p. 2 - I think it should be noted that Dr. Dundas has virtually no history in our community, as he has only been here a short time (less than a year?). He is thus not in a position to see any patterns. p. 2 - It appeared to me that Dr. Kilburn WAS clear about the various sulfur compounds, namely that there is no need to differentiate because they act the same on the human body. p. 3 - first word: correct the spelling of Keala's name. P. 4 - add another bullet to Initial thinking on studies, because I remember suggesting that we use Dr. Kilburn's list from his power point, which was printed out and distributed, as a starting point. No one vetoed that, so it should be added.