

RAS 13312

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March 26, 2007 (8:45am)

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
Pa'ina Hawaii, LLC)
)
Materials License Application)
_____)

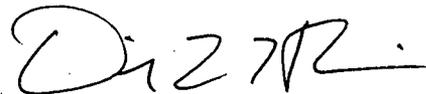
Docket No. 30-36974-ML
ASLBP No. 06-843-01-ML

NOTICE OF FILING ORIGINAL SUPPLEMENTAL DECLARATION OF
GEORGE PARARAS-CARAYANNIS, Ph.D. IN SUPPORT OF INTERVENOR
CONCERNED CITIZENS OF HONOLULU'S CONTENTIONS RE:
DRAFT ENVIRONMENTAL ASSESSMENT AND DRAFT TOPICAL REPORT

Attached hereto is the original, signed supplemental declaration of George Pararas-Carayannis, Ph.D., filed on March 19, 2007 in support of Concerned Citizens of Honolulu's Contentions Re: Draft Environmental Assessment And Draft Topical Report.

Dated at Honolulu, Hawai'i, March 23, 2007.

Respectfully submitted,



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TEMPLATE = SECY-037

SECY-02

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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**SUPPLEMENTAL DECLARATION OF GEORGE PARARAS-CARAYANNIS,
Ph.D. IN SUPPORT OF CONCERNED CITIZENS' CONTENTIONS RE:
DRAFT ENVIRONMENTAL ASSESSMENT AND DRAFT TOPICAL REPORT**

Under penalty of perjury, I, Dr. George Pararas-Carayannis, hereby declare that:

1. I have over 40 years of experience in the field of natural disaster risk assessment. Details of my education and experience relating to natural disasters, along with a true and correct copy of my resume, were set forth my original declaration.
2. I have reviewed Pa'ina Hawaii, LLC's Answer to Concerned Citizens of Honolulu's contentions, paying particular attention to the declaration of Gray*Star, Inc. Vice President and Chief Operating Officer Russell N. Stein. Nothing in Pa'ina's materials provides any reason to alter my opinions about the serious public safety threats posed by Pa'ina's choice of irradiator site, which is susceptible to flooding by tsunamis and hurricanes, wind damage by hurricanes, and liquefaction by earthquakes. The risk of releases of radioactive materials due to these natural phenomena could easily be avoided by locating the site inland and on solid ground, rather than unconsolidated fill.
3. In its Answer, Pa'ina improperly relies on the notation on the current Hawai'i State Civil Defense tsunami evacuation maps to refute my conclusion that the

proposed irradiator site is at risk of flooding from tsunamis. As noted in the report attached to my original declaration as Exhibit "9," the current evacuation maps are based on maps I helped prepare in 1967, which relied primarily on historical tsunami data using empirical methods, rather than numerical modeling. This method tends to underestimate the potential impact of a tsunami, including inundation limits and runups. Thus, the notation on the Civil Defense maps that the rise in water levels within Ke'ehi Lagoon should not exceed four feet is unsupported.

4. Moreover, Pa'ina ignores that the data on which the current tsunami evacuation maps are based predate the massive alterations of Ke'ehi Lagoon caused by dredging the lagoon for construction of Honolulu Airport's reef runway, which began in 1973. As I explained in my report, both the presence of the Reef Runway and the deepening of Ke'ehi Lagoon through dredging could increase resonance effects and cumulative pile-up of a tsunami at the apex of the basin, which is at the end of Palekona Street, where Pa'ina proposes to place its irradiator. Pa'ina has failed to conduct any numerical modeling, which is the only accepted means to reveal the full effects of dredging the lagoon and altering the shoreline.

5. As for Mr. Stein, he provides no reason to question my conclusions that the proposed site for Pa'ina's irradiator is unsafe because of its vulnerability to natural disasters. At the outset of his declaration, he admits he has no background in disaster risk analysis and that he cannot evaluate the potential likelihood and severity of disaster incidents that may impact the site of the proposed irradiator. Stein Decl. ¶ 7. Despite his lack of expertise, Mr. Stein asserts that all potential effects of all natural hazards at the site, no matter how severe, have been accounted for through the irradiator design, and

there could never be a release of radioactive material into the environment. Mr. Stein's statements lack any support; there is simply no evidence his generic irradiator design would provide adequate protection under the unique conditions at issue in this case: construction on a landfill site, with substrata of unconsolidated, alluvial, and storm surge sediments, that lies within a tsunami evacuation zone and is vulnerable to flooding by hurricane surges.

6. Mr. Stein fails to account for the fact that construction of a critical facility on a landfill site next to the sea is not the same as construction at higher elevation, at a safer location and on firmer ground. There is no material strength or strain compatibility between the different alluvial deposits of a landfill location. What holds the landfill material is not internal strength, but simply cohesion and friction of one type of material against another type of material. It is this friction and cohesion that renders some degree of strength to a landfill site. The strength depends on how hard the materials are pushed together, like two pieces of sandpaper rubbing together. This strength can diminish significantly by the ground accelerations (horizontal and vertical) of an earthquake, or by the flooding effects of tsunami or hurricane surge.

7. As recognized in Pa'ina's Geoanalytical Report, the site where Pa'ina proposes to put its irradiator is comprised of "an eight-foot-thick zone of fill consisting of silty sand and gravel," with the lower five feet of fill "soft or very loose." Below these layers of loose soft material are storm surge deposits to a depth of about 36.5 feet. Such landfill areas are extremely susceptible to ground liquefaction. The Marina District of San Francisco suffered great damage during the 1989 Loma Prieta earthquake because it

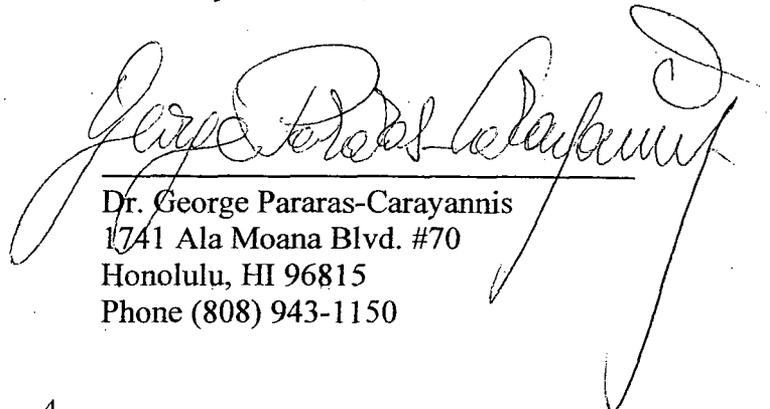
was located on such unconsolidated sediments on land reclaimed following the 1906 San Francisco earthquake.

8. Mr. Stein makes an unsupported general statement that support beams, I-beams, and backfill material surrounding and at the bottom of the pool will anchor the irradiator in the event of storm surges or liquefaction. There is no indication, however, that Mr. Stein's design specifically considered how the pool can be anchored in "soft or very loose" sediments or the effect of hydrostatic forces on the irradiator pool due to elevated water levels from tsunamis or hurricane surges. Such questions cannot be answered based on a generic design. Analysis of the facility's safety must take into account the characteristics of the proposed site, which is particularly vulnerable to natural disasters, but, to date, Pa'ina has failed to present any such analysis.

9. In summary, as I determined through my risk assessment and stated in my prior declaration, hurricanes, tsunamis, and earthquakes pose a real risk at the proposed irradiator site that merits rigorous review. Mr. Stein neither refutes this position nor demonstrates that such a rigorous review has been undertaken.

I declare under penalty of perjury that the factual information provided above is true and correct to the best of my knowledge and belief, and that the professional opinions expressed above are based on my best professional judgment.

Executed at Athens, Greece on this 15th day of March, 2007.



Dr. George Pararas-Carayannis
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CERTIFICATE OF SERVICE

The undersigned hereby certifies that, on March 23, 2007, a true and correct copy of the foregoing document was duly served on the following via e-mail and first-class United States mail, postage prepaid:

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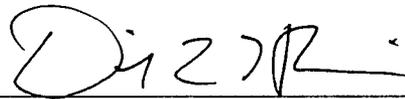
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Dated at Honolulu, Hawai'i, March 23, 2007.



DAVID L. HENKIN
Attorney for Intervenor
Concerned Citizens of Honolulu



EARTHJUSTICE

Because the earth needs a good lawyer

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INTERNATIONAL JUNEAU, ALASKA OAKLAND, CALIFORNIA
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TRANSMITTAL LETTER

TO: Office of the Secretary VIA FIRST CLASS MAIL
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
Attention: Rulemakings and Adjudications Staff

FROM: David L. Henkin

DATE: March 23, 2007

RE: Pa`ina Hawaii, LLC (Materials License Application), Docket No. 30-36974-ML,
ASLBP No. 06-843-01-ML

ENCLOSURES	DATE	DESCRIPTION
Original and two copies:	3/23/07	NOTICE OF FILING ORIGINAL SUPPLEMENTAL DECLARATION OF GEORGE PARARAS-CARAYANNIS, Ph.D. IN SUPPORT OF INTERVENOR CONCERNED CITIZENS OF HONOLULU'S CONTENTIONS RE: DRAFT ENVIRONMENTAL ASSESSMENT AND DRAFT TOPICAL REPORT

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REMARKS: