

Before the  
Federal Communications Commission  
Washington, DC

KES COMMUNICATIONS, INC. ) MM Docket No. 93-53  
)  
)  
)  
) File No. BPH-911003MH  
)  
LORI LYNNE FORBES ) File No. BPH-911004MH  
)  
)  
For Construction Permit for a )  
New FM Station on Channel 256C )  
in Waimea, Hawaii )

To: Honorable Joseph P. Gonzalez  
Administrative Law Judge

**OPPOSITION TO MOTION TO ENLARGE ISSUES AGAINST  
LORI LYNNE FORBES**

Lori Lynne Forbes ("Forbes"), by her attorney, hereby submits her opposition to the "Motion to Enlarge the Issues Against Lori Lynne Forbes" filed by KR Partners ("KR") in this proceeding. With respect thereto, the following is stated:

Forbes has proposed to located her proposed station at 19° 42' 56"N, 155° 55' 00" W, at the existing transmitter site of Stations KVHF-TV and K299CS, near Kaupluehu Crater. KR is requested the enlargement of issues in this proceeding based upon an engineering study it has submitted, whereby it claims that Forbes does not have clear line-of-sight to Waimea and consequently, it will be unable to provide a city-grade signal to Waimea (the proposed community of license).

KR's Motion must be denied. Pursuant to Section 73.315(a) of the Rules, each applicant is required to choose a transmitter site so that:

on the basis of the effective radiated power and antenna height above average terrain employed, a minimum field strength of 70 dB above one uV/m (dBu), or 3.16 mV/m, will be provided over the entire principal community to be served.

47 C.F.R. § 73.315(a). Pursuant to Section 73.315(b) of the Rules:

The location of the antenna should be so chosen that line-of-sight can be obtained from the antenna over the principal city or cities to be served; in no event should there be a major obstruction in this path.

47 C.F.R. § 73.315(b) (emphasis added). Under Section 73.313(e):

In cases where the terrain in one or more directions from the antenna site departs widely from the average elevation of the 3 to 16 kilometer sector, the prediction method may indicate contour distances than are different from what may be expected in practice... In such cases, the prediction method should be followed, but a supplemental showing may be made concerning the contour distances as determined by other means.

47 C.F.R. § 73.313(e). The Commission has recognized that line-of-sight is not an absolute requirement. Rush County Broadcasting Co., 20 R.R.2d 783 (1970); Rosamond Radio, Inc., 7 FCC Rcd 3609, 3609-10 ¶ 5 (Chief, Audio Services Div. 1992). In Jesse Willard Shirley, 24 R.R.2d 982 (1972), the Commission held there was no violation of Section 73.315(b) where the city to be served was covered by a 3.16 mV/m contour despite the fact that several hills obstructed line-of-sight into the city. Additionally, although the rule speaks in terms of providing service to the "entire principal community," applicants have been deemed to "substantially comply" with the Rule when service is provided so that at least 80% of the community of license is served.<sup>1</sup> In more recent cases, the rule has been refined to emphasize

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<sup>1</sup> See, e.g. John R. Hughes, 50 Fed. Reg. 5679 (Feb. 11, 1985); George Henry Clay, 3 FCC Rcd 41, 44 n.2 (Chief, Audio Services Div. 1988); Sue A. Underwood and Brenda Stroud, 3 FCC Rcd 153, 156, ¶17 (Chief, Audio Services Div. 1988); Jerry Swink, 3 FCC Rcd 2585,

service to the populated area of a community, by stating that:

the FM Branch does not require waiver of this requirement unless the proposed 3.16 mV/m coverage falls below 80% of the residential area of the principal community.

Chinese Radio Service, 5 FCC Rcd 312, 314, ¶ 12 (Chief, Audio Services Div. 1990) (emphasis added).<sup>2</sup> As the Chief, Audio Services Division stated in granting an application for relocation of WZSH(FM), South Bristol Township, New York:

The engineering statement submitted... states that the area in South Bristol Township that would fall outside the predicted 70 dBu contour of WZSH(FM) is 11.8 square miles, but contains only 18 permanent residences with an estimated population of 46 residents. Due to the heavily forested, undeveloped recreational nature and sparse population of the area of South Bristol Township that would not receive proposed city grade coverage, it should not be deemed a residential area of the population for purposes of 47 C.F.R. § 73.315(a) pursuant to Southwest or Hughes. Thus, . . .it has been determined that your proposal complies with applicable FM Branch policy and does not require a waiver of 47 C.F.R. § 73.315(a) since your proposed coverage encompasses 100% of the residential area of South Bristol Township.

See Attachment 2. Accord, Central Bucks Broadcasting Co., HDQ, MM Docket Nos. 84-850-62 (Chief, Mass Media Bureau Sept. 11, 1984) (where city-grade coverage includes the major population centers and area of highest population density, waiver of city-grade coverage

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¶ 3 (Chief, Audio Services Div. 1988); Visalia Broadcast Limited Partnership, 3 FCC Rcd 2770, ¶ 5 (Chief, Audio Services Div. 1988); Goodlettsville Broadcasting Co., 3 FCC Rcd 6608, 6610, ¶ 15 (Chief, Audio Services Div. 1988); Southwest Educational Media Foundation of Texas, Inc., 4 FCC Rcd 6193, ¶ 4 (Chief, Audio Services Div. 1989).

<sup>2</sup> See also, NJT Limited Partnership, 4 FCC Rcd 7969, 7970, ¶ 9 (Chief, Audio Services Div. 1989). RC Communication, Inc., 5 FCC Rcd 3165, 3167, ¶ 8 (Chief, Audio Services Div. 1990); Rucker Radio, 5 FCC Rcd 3293, ¶ 4 (Chief, Audio Services Div. 1990); Caprock Educational Broadcasting Foundation, 5 FCC Rcd 5170, ¶ 2 (Chief, Audio Services Div. 1990); Rancho Mirage Radio, 5 FCC Rcd 721, 723 n.3 (Chief, Audio Services Div. 1990); New Song Communications, Inc., 5 FCC Rcd 3949, ¶ 2 (Chief, Audio Services Div. 1990).

rule is warranted).

If an applicant opts to make a "supplemental showing" under Section 73.313 of the Commission's rules, such showings:

should describe the procedures used and should include sample calculations. Maps of predicted coverage should include both the coverage as predicted by the regular method as well as predicted by a supplemental method. When measurements of area are required, these should include the area obtained by the regular prediction method and the area obtained by the supplemental method.

47 C.F.R. § 73.313(e).

***KR's Inadequate Showing Does Not Comply With the Commission's Rules***

First, as a basic threshold matter, KR has failed to submit the basic information necessary to evaluate its showing. KR's engineer provided no sample calculations so that a competent professional could evaluate the accuracy of his conclusions -- as a result, diffraction losses are stated without any apparent basis. Similarly, no map is included whereby it can be verified what community boundaries are being used for Waimea to support his overall conclusion that "no" part of Waimea would be served by a city-grade contour. In this respect, KR's showing is similar to those found in Kings Beach, CA and Fallon, NV, 6 FCC Rcd 4375 (Chief, Allocations Branch 1991), where a petitioner submitted a TechNote 101 terrain study, alleging that an allotment would not provide the required city-grade service to the proposed community of license, but that the Commission rejected, stating:

Rule Section 73.313 provides for the submission of such propagation methods as Tech Note 101 to supplement, but not supplant, the Commission F(50,50) curves when the terrain departs widely from average terrain, as it appears to do here. For such use to be valid, however, Section 73.313 mandates that the proponent must describe the procedures used in employing the

study as well as the assumption made and the methodology employed. The proponent also must provide sample calculations. [The proponent] does not do any of this. It only declares that Tech Note 101 was used to calculate the diffraction losses. Such failures alone its allegations of a received signal of less to 70 dBu. [The proponent] also does not attempt to show the extent of the alleged faulty coverage. It does not show, for example, the boundaries of [the community of license] and the extent to which the 70 dBu signal allegedly is lacking. Therefore, even if its showing were permissible, [the proponent's] Tech Note 101 analysis is invalid, because it does not comply with the standards set out for use of alternative propagation methods.

*Id.* at 4376 ¶ 5. Similarly, as the Commission stated in Cresswell, OR, 4 FCC Rcd 7040 (Chief, Policy and Rules Div. 1989):

For the showing to be at all useful, the procedures used in preparing the study must be described as well as the assumptions made and the methodology employed, and, in addition, sample calculations must be provided.

*Id.* at 7041 ¶ 9. The same deficiencies exist in KR's showing.<sup>3</sup> Therefore, KR has simply not met its burden under the Rules.

#### *Visual Inspection of the Site*

From a more substantive standpoint, it has been determined conclusively that KR's results are simply inaccurate. A Consulting Engineer located in Hawaii, Mr. Clayton Caughill,

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<sup>3</sup> See also, Margaret C. Schaller, 5 FCC Rcd 5329, ¶ 4 (Chief, Audio Services Division 1990) where the Commission stated:

While supplemental showings to demonstrate deficient city coverage may be considered by the Commission pursuant to 47 C.F.R. § 73.313(e), the methodology must be technically correct and must clearly and convincingly establish that, contrary to the results obtained using the predicted contour method, the community of license will not receive the requisite city-grade coverage.

was retained by Forbes. He personally is familiar with the transmitter site proposed by Forbes, and personally confirms that although the terrain is irregular at points near the location of the transmitter site in the direction of Waimea, the actual, literal terrain is such that there is no terrain obstruction in the direct path to Waimea. Engineering Statement at 1. In fact, from Waimea, the Forbes transmitter site can be seen.

### ***Terrain Plots***

To confirm this visual information, Forbes' Consulting Engineer also conducted three additional studies. First, to ascertain the overall accuracy of KR's Engineering Consultant's single terrain plot, Forbes' Consulting Engineer determined the exact location of Waimea, obtained copies of the most recent and therefore most accurate terrain data for the area, and ran additional terrain plots every at six key locations in Waimea from the Forbes transmitter site at Forbes' proposed location on the tower.<sup>4</sup> Engineering Statement at Attachment 2. As seen in the Engineering Statement, these terrain plots verify that there is no terrain shielding (and therefore no "major obstruction") between Forbes' proposed site and various population centers and centers of commerce within the community of Waimea. Engineering Statement at 2.

### ***Shadow Study***

Second, a shadow-study was run based upon Forbes' proposed center of radiation

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<sup>4</sup> The locations chosen are the Hawaii Preparatory Academy in Waimea at 32.63°; the Waiaka Power Plant in Waimea at 33.21°; Highway 190 and 19 Intersection in Waimea at 36.75°; the Waimea Fire Station at 37.37°; the Waimea-Kohala Main Building at 37.51°; and the western edge of the Puukapu Homesites at 40.02°.

utilizing the coordinates of her proposed site. The study accesses the terrain data for the area and plots as solid lines those locations where shadowing of some degree would occur. As seen in the Engineering Statement at Attachment 1, although predicted shadowing of some degree would occur at locations before and beyond the community of Waimea due to the proximity of Kaupluehu Crater, the study verifies that there would be no shadowing within the community of Waimea, itself. Engineering Statement at 2. As Forbes' Consulting Engineer states:

Therefore, under those circumstances, the FCC's standard prediction method within Waimea remains accurate, and it is expected that a full city-grade signal would be provided to the entirety of Waimea.

Engineering Statement at 2.

***Listening Test***

Finally, as a means to verify the accuracy of the computerized data plots and profiles and the local terrain data, Forbes' Consulting Engineer arranged for a field listening test to be made based upon the operation of Station K288CS which, as noted above, is an FM translator already located and already operating from Forbes' proposed site. That existing, operating station operates at a power which only is a minuscule fraction (.00026) of the power proposed by Forbes in her application (38 kW vs. 10 kW), with a center of radiation five meters below that proposed by Forbes -- as a result, that existing station would even more affected by any terrain obstruction as may exist. A car equipped with a standard FM radio capable of receiving Station K288CS was driven from Kona (near the Forbes transmitter site) toward Waimea. The following results were obtained:

Entering Waimea from the direction of HPA and Kawaihe on Highway 19 (Kawaihae Road), I turned left onto Laelae Road. The signal was clear for the length of Laelae Road. As I turned

onto a short street named Kupai Place, the signal was only fair and not completely clear. I then continued to the end of Laelae Road (also sign reads Laelele) and turned onto Puuki Place, where the signal was barely receivable. The changes appear to follow the direction which my vehicle is driven, and may result from the directional characteristics due to receive antenna mounting. I was about to continue, proceeding through Waimea toward Hilo on Highway 19, when the station abruptly left the air.

Engineering Statement at Attachment 2. The "outages" of service experienced in the direction of Waimea essentially match those predicted by the shadow study, and a full, strong, undistorted signal was received in Waimea, again, just as predicted by the shadow study and the terrain profiles. At the power proposed by Forbes (which is 3800 times that of the "test" translator), a signal level of 80.81 dBu (which is 3.5 times that which is required under the Commission's rules) will be provided over the community of Waimea. Therefore, based upon this on-site study of the local terrain and their effect on local propagation of signals, it has been established that there is no "major obstruction," no inability to provide city-grade service, and there is no lingering question of fact that needs to be resolved in a hearing.

#### *Deficiencies in KR's Study*

KR's engineering study appears to have suffered from at three deficiencies. First, its engineer did not enjoy any on-site familiarity with the site and the local terrain that he could factor into his analysis. Second, it is not at all clear that KR's engineer used the proper boundaries for the community of Waimea, and could have instead been evaluating the effect of the local terrain on certain of the areas for lie before, beyond, or to the side of Waimea. A detailed map showing the actual boundaries of Waimea is attached hereto at Figure 2 to the Engineering Statement. Finally, it appears that he inadvertently mixed together two incompatible databases. As stated in Attachment 3, which is a copy of U.S. Geological Survey Bulletin

1875-B, existing maps of Hawaii are based on the Old Hawaiian Datum ("OHD") rather than North American Datum, while computerized data uses "North American Datum -- 1983" ("NAD-83"). The correction factors that must be used are shown in Attachment 3. Since the data generated by the two datums are not compatible, it was incorrect for KR's Consulting Engineer to use map data (based upon OHD) for the first seven kilometers and computerized data (based upon NAD-83) for the remainder of the path. Engineering Statement at 3.

***Conclusion***

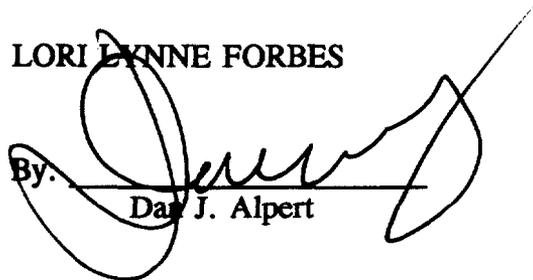
In short, KR's showing did not satisfy the Commission's Rules and further, when a full showing is presented (including using proper coordinates, performing multiple terrain profiles, engaging in a visual inspection of the actual site, and conducting receiving tests, and engaging in full explanations of the methods used and that data employed) it is seen that there is no terrain obstruction preventing service to the community of Waimea from the Forbes site, and that no issue questioning this matter is warranted in this proceeding.

WHEREFORE, it is respectfully requested that the "Motion to Enlarge the Issues Against Lori Lynne Forbes" be denied.

Respectfully submitted,

LORI LYNNE FORBES

By.

  
Dan J. Alpert

1250 Connecticut Ave., N.W.  
7th Floor  
Washington, DC 20036

May 18, 1993

**ATTACHMENT 1**

239

FEDERAL COMMUNICATIONS COMMISSION

WASHINGTON, D.C. 20554

JAN 27 1989

IN REPLY REFER TO:

8920-GRM

Linda Blair, Esquire  
Harvey J. Schulman, Esquire  
Ginsburg, Feldman, and Bress, Chartered  
1200 Connecticut Ave., NW  
Washington, D.C. 20036

In re: WZSH(FM), South Bristol Township, NY  
The Great Lakes Wireless Talking Machine Co.  
BPH-851220ID  
Petition for Reconsideration

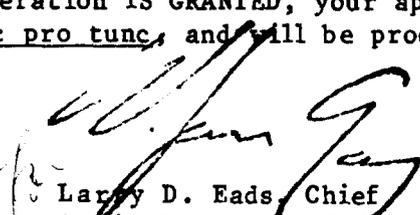
Dear Counsel:

This is in reference to the January 19, 1987 Petition for Reconsideration of the December 12, 1986 action of Chief, FM Branch which dismissed the above captioned application.

The FM Branch dismissed the application because the proposed relocation of the WZSH(FM) transmitter would no longer afford a city-grade (70 dBu) signal to all of South Bristol Township, pursuant to 47 C.F.R. § 73.315(a). However, the FM Branch no longer requires a waiver of the requirement unless the proposed city grade coverage falls below 80% of the residential area of the principal community. See Southwest Communication, Inc., Reference 8920-HVT released July 16, 1986, citing John R. Hughes, 50 Fed. Reg. 5679 (1985).

The engineering statement submitted as Exhibit 1 to your petition states that the area in South Bristol Township that would fall outside the predicted 70 dBu contour of WZSH(FM) is 11.8 square miles, but contains only 18 permanent residences with an estimated population of 46 residents. Due to the heavily forested, undeveloped recreational nature and sparse population of the area of South Bristol Township that would not receive proposed city grade coverage, it should not be deemed a residential area of the principal community for purposes of 47 C.F.R. § 73.315(a) pursuant to Southwest and Hughes. Thus, on review it has been determined that your proposal complies with applicable FM Branch policy and does not require a waiver of 47 C.F.R. § 73.315(a) since your proposed coverage encompasses 100% of the residential area of South Bristol Township.

Accordingly, your petition for reconsideration IS GRANTED, your application IS REINSTATED AND ACCEPTED for filing nunc pro tunc, and will be processed routinely.



Larry D. Eads, Chief  
Audio Services Division  
Mass Media Bureau

cc: Steven D. Gavin, Esq.

**ATTACHMENT 2**

**Lori Lynne Forbes**  
**Engineering Statement**  
**Response to Petition to Enlarge Issues**

**Channel 252C, Walmea, Hawaii**

**May 17, 1993**

**Caughill-Palitz, Inc., Honolulu, Hawaii 96826**

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**1750 Kalakaua Ave., #3-120 (800) 222-4274 / (808) 941-3618**



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**Lori Lynne Forbes**  
**Engineering Statement**  
**Response to Petition to Enlarge Issues**  
**Channel 252C in Waimea, Hawaii**  
**May 17, 1993**

**Declaration**

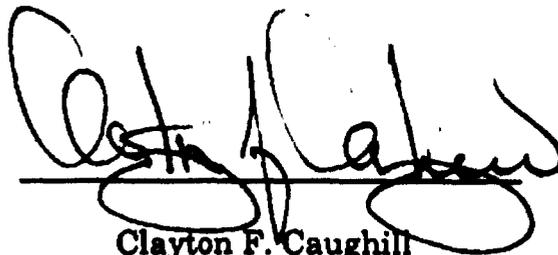
I, Clayton F. Caughill, declare and state:

That I am certified by the Society of Broadcast Engineers as a Professional Broadcast Engineer, the holder of an FCC General Radiotelephone Certificate, and that my qualifications are known to the Federal Communications Commission;

That I am President of the firm Caughill-Palitz, Inc., and that firm has been retained by Ms. Lori Lynne Forbes, applicant for Construction Permit for Channel 252C in Waimea, Hawaii, in the matter of a Petition to Enlarge Issues filed before the Commission by KR Partners, whose application is mutually exclusive;

That I have carefully examined the Engineering Statement and attachments prepared on behalf of KR Partners by Mr. William P. Suffa, P.E. dated April 14, 1993 which were filed as Attachment 2 of the KR Partners petition;

That all materials in this Engineering Statement with attachments were prepared by me or under my direct supervision, and that all facts contained herein are true of my own knowledge except wherein stated to be on information and belief, and as to those facts, I believe them to be true.

A handwritten signature in black ink, appearing to read "Clayton F. Caughill", written over a horizontal line. The signature is stylized and cursive.

Clayton F. Caughill  
Executed on this 14th day of May, 1993

**Lori Lynne Forbes**  
**Engineering Statement**  
**Response to Petition to Enlarge Issues**  
**Channel 252C in Waimea, Hawaii**  
**May 17, 1993**

### **Engineering Statement**

Attached hereto as Attachment 1, is the Forbes 3.16 mV/m contour, computed according to Section 79.313(c) of the Commission's Rules and using the WGS-72 3-second digital terrain database. The coordinates of the community of Waimea (also known as Kamuela) are those of the Kamuela Post Office. boundaries shown on the attached enlarged map, attached as Exhibit 3 show the entire community of Waimea. To the west, on Kawaihae Road, is the adjacent community of Waiaka, which includes the Hawaii Preparatory Academy campus. It is usually included in references as part of the Waimea community.

I am personally familiar with the Forbes antenna site, that of KVHF-TV. I have visited the site on several occasions. There is an irregularly shaped line of craters and lava flows which protrudes upward in the direction of Waimea community. The terrain of the area rises rapidly and is extremely irregular in elevation, including both the land upon which the KVHF-TV site is located, and the terrain of the crater line identified in the presentation made by Mr. William P. Suffa, P.E. on behalf of KR Partners as providing terrain shielding between the KVHF-TV site and Waimea.

Based upon my 1992 personal examination of the site and the surrounding terrain, at the height at which the KVHF-TV antenna is located, it does not appear that it will be terrain shielded in the direction of Waimea, when viewed from the site at ground level.

To further confirm that visual observation, I ran a terrain profile study using the reference coordinates for Waimea (which resulted in the same 37 degree True bearing to Waimea as identified by Mr. Suffa, and shown in the original Forbes application). That terrain profile graph is included as Figure 1, attached.

In addition, I ran terrain profile studies from the Forbes site coordinates to coordinates for the Waiaka Power Station at the Western extremity of the

Waimea/Kamuela area, to several locations within the Waimea community (as identified on the various profile graphs), and to a group of residences defining the approximate end of the Waimea populated area on the eastern side. They are included as Attachment 2 to this Statement. All of this information shows no terrain shielding.

To further confirm that data, a radio shadow map was made using the WGS-72 3 second digital terrain database. The computer program is designed to plot a line wherever any shadowing would occur along a path from the transmitter site to a location 30 feet above the ground, which is the FCC's criteria. The shadow map that was generated is attached hereto and labeled Exhibit 1. Waimea is shown on the map, and it is located approximately 42.6 km. As seen, although operations from the proposed site would result in some shadowing close-in to the site, in the range of 3 to 5 kilometers, the Waimea community itself receives no shadowing, whatsoever. Therefore, under those circumstances, the FCC's standard prediction method within Waimea remains accurate, and it is expected that a full city-grade signal would be provided to the entirety of Waimea.

Since the Forbes site is an existing transmitter site, a final study was performed to determine whether service from the stations currently operating at the Forbes site suffer from terrain obstruction or shadowing within the community of Waimea. Specifically, Station K288CS operates from the Forbes site at a power of 10 watts (which is .00026 of the power proposed to be used by Forbes), at a center of radiation of 1737 m. AMSL (which is five meters below the height proposed by Forbes). Therefore, if obstructions caused by the terrain result in reductions in service from the Forbes site, those obstructions would have an even more destructive effect on the existing low-power translator. K288CS rebroadcasts signals from KRTR, Kailua-Honolulu and KVHF-TV rebroadcasts signals of UHF TV station KOBN, Kailua Hawaii, both on the island of Oahu.

I contacted Mr. David Fransen, Jr., General Manager of Station KLEO, Kahaluu, Hawaii. Mr. Fransen is a personal acquaintance. I consider him to be proficient technically, and certainly reliable to perform listening tests. I asked him to drive from Kailua, Kona to Waimea on Thursday, May 13, 1993 with his car radio tuned to 105.5 MHz., and to carefully record K288CS reception details, including mileage points if and where reception faded or returned.

Mr. Fransen's attached statement indicates that signals from the K288CS translator could be heard in the Waimea area. Our tests were cut short when an a Hawaii Air National Guard Helicopter crashed into major high voltage power trunk lines connecting the windward and downtown sections of Oahu. These lines also provide service to the transmitter site for both KRTR and KOBN. Both stations were off the air for an extended period and then returned to the air on emergency equipment operating at very low power.

Both KVHF-TV and translator station K288CS could receive no signal to rebroadcast and ceased operation. Low power operation by the Oahu stations is expected to continue for an extended period while Hawaiian Electric repairs the major cross-island power link which feeds the Oahu tower site. As a result, more detailed listening tests could not be submitted in the time allowed for this response.

In those areas driven by Mr. Fransen, including the Hawaii Preparatory Academy campus, Puuki Place and along Laelale road in Waimea, Mr. Fransen reported reception of K288CS signals before the Oahu stations' signal failure. At

applicant's site coordinates were determined by surveyors using data more accurate and methods of affixing coordinates more modern than the Old Hawaii Datum.

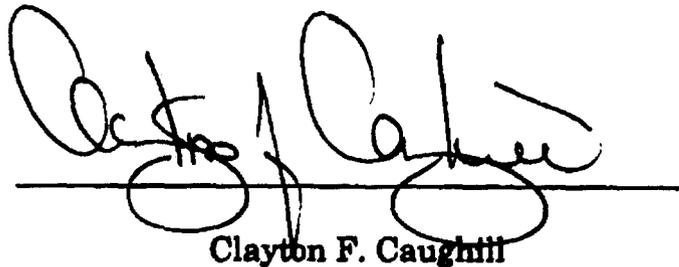
In Conclusion, we have performed an obstruction study consisting of a radio shadow analysis and a radio path analysis in a manner consistent with methods acceptable by the FCC, using the most accurate terrain data available.

We have supported this study with listening tests as thoroughly as possible given the limited time and conditions available to us, with a typical receiver in the proposed community of license, and we have inspected both sites on various occasions, where Mr. Suffa has not.

There is no indication that Mr. Suffa is familiar with the accepted boundaries of the community of Waimea. While some shadowing will occur in areas outside Waimea; according to the attached radio shadow map within Waimea itself and the populated areas adjacent to Waimea, there is no shadowing.

Our information shows that the Commission's standard prediction method accurately depicts service to Waimea in excess of 3.16 mV/m.

Signed,



Clayton F. Caughill

Executed this 17th Day of May, 1993

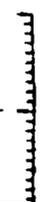




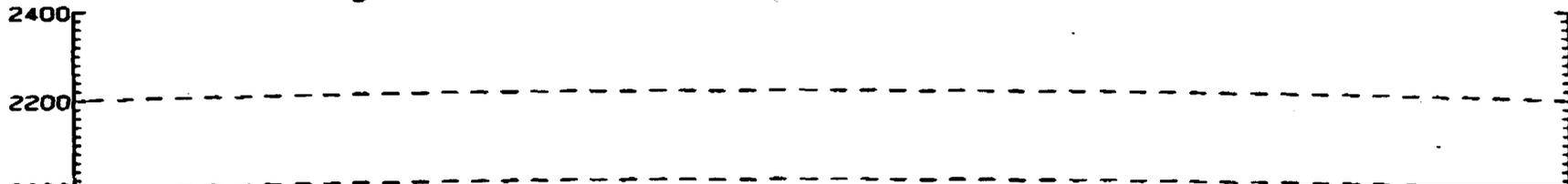
Site: KVHF TV Ant  
N 19 42 56 W 155 55 0  
Ant. Elev. (AMSL): 1742.0 m  
Path azimuth: 36.96 degs.

Frequency: 100.0 MHz  
Path Length: 42.8 km  
Total Path Loss: 108.7 dB  
Excess Path Loss: 3.6 dB

Site: Waimea, HI  
N 20 1 24 W 155 40 12  
Ant. Elev. (AMSL): 907.9 m  
Path azimuth: 217.05 degs.



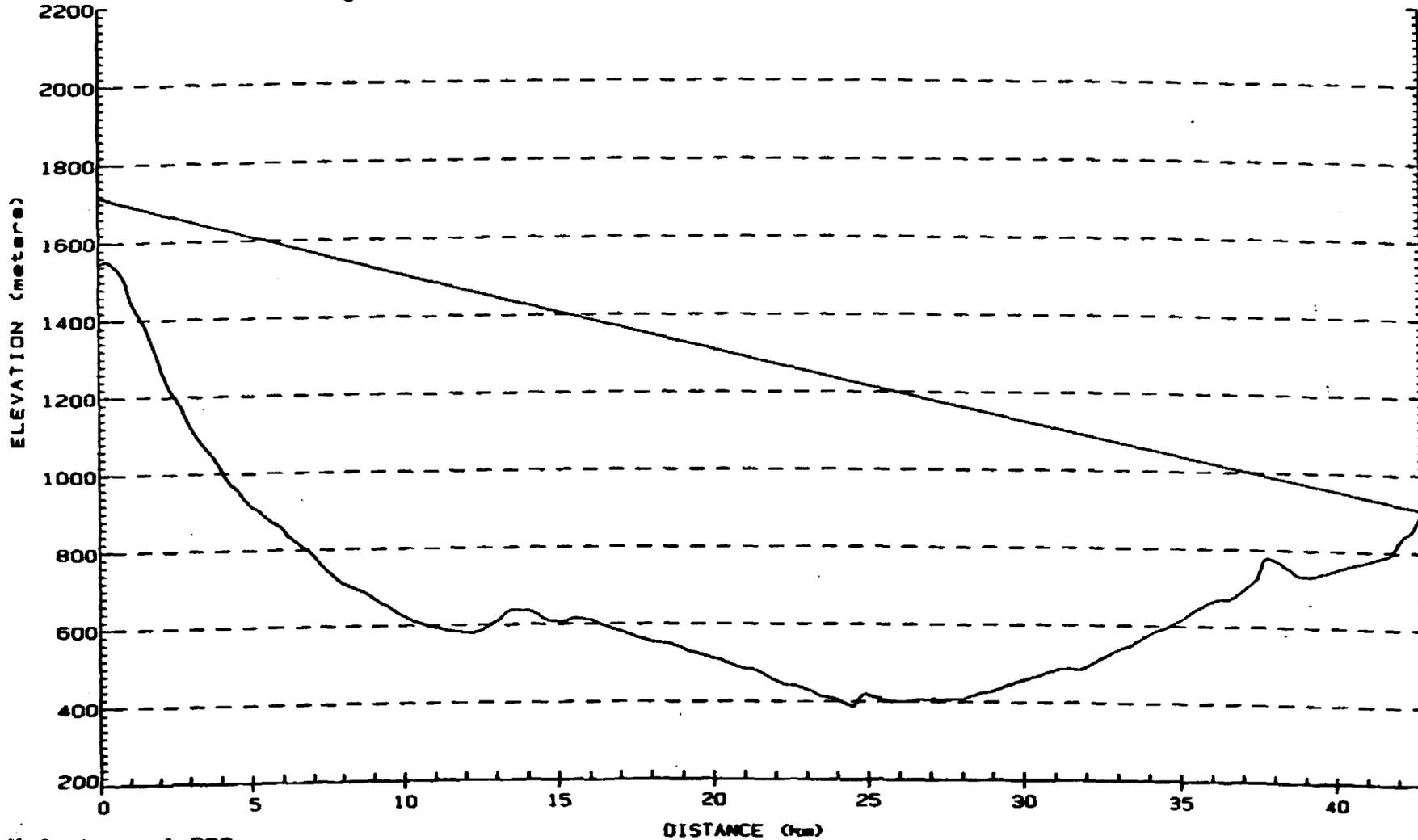
2200



Site: KLUA Antenna  
 N 19 43 15 W 155 55 16  
 Ant. Elev. (AMSL): 1717.0 m  
 Path azimuth: 36.96 degs.

Frequency: 100.0 MHz  
 Path Length: 42.8 km  
 Total Path Loss: 105.1 dB  
 Excess Path Loss: .0 dB

Site: Waimea, HI  
 N 20 1 43 W 155 40 28  
 Ant. Elev. (AMSL): 907.9 m  
 Path azimuth: 217.05 degs.



K factors: 1.333  
 Fresnel Zone: .60  
 3 Second Database - WGS 72  
 Rain loss: .0 dB  
 Urban loss: .0 dB  
 Foliage loss: .0 dB

Caughill-Pelitz, Inc. Consulting Engineers Honolulu, Hawaii, USA	

<h1 style="margin: 0;">RADIO PATH</h1> <p style="margin: 0;">Application</p> <p style="margin: 0;">April 29, 1993</p>	Exhibit E-2
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**AFFIDAVIT OF DAVID R. FRANSEN, JR.**

**I, David R. Fransen, Jr. depose and state that:**

**I am employed as Station Manager for Station KLEO, Kahaluu, Hawaii and that I have experience in the fields of radio station programming and engineering. That I have been**