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JAN 16 1998
FCC MAIL ROOM

January 15, 1998

Dr. Robert Cleveland
Office of Engineering and Technology
Federal Communications Commission
2000 M Street, N.W., Suite 266
Washington, DC 20554

Re: ET Docket 93-62
Disabilities Issues Task Force
Cellular Phone Taskforce Appeal of Feb. 2, 1997 Discrimination Complaint

Dear Dr. Cleveland:

Enclosed is the Affidavit I have sent to the High Court in Ireland in a cell phone case. I sent you the draft of this Affidavit as Exhibit #3 of our "Ex Parte Comments" on December 21, 1997.

Sincerely,

Arthur Firstenberg

Arthur Firstenberg
President

P.S. Regie Siberski, who is electrically sensitive and a member of the Cellular phone Taskforce, tells me she has been in contact with you on this issue since at least the early 1980's.

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January 15, 1998

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William Caton, Acting Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, DC 20554

Re: ET Docket 93-62
Disabilities Issues Taskforce
Cellular Phone Taskforce Appeal of Feb. 2, 1997 Discrimination Complaint

Dear Mr. Caton:

Enclosed are 5 copies of the Affidavit I have sent to the High Court in Ireland in a cell phone base station case. I have this day mailed one copy Express Mail to Dr. Robert Cleveland in the Office of Engineering and Technology. This is the Affidavit, of which I sent a draft to the FCC as Exhibit #3 of our "Ex Parte Comments" on December 21, 1997 in the above proceedings.

Sincerely,

Arthur Firstenberg

Arthur Firstenberg
President

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List A B C D E

THE HIGH COURT

Record No._____

BETWEEN:

FRANK SZABO (A MINOR) SUING THROUGH HIS MOTHER AND NEXT FRIEND DORIS SZABO, EILISH WALSH (A MINOR) SUING THROUGH HER MOTHER AND NEXT FRIEND GERALDINE WALSH, SIOBHAN WALSH (A MINOR) SUING THROUGH HER MOTHER AND NEXT FRIEND GERALDINE WALSH, ANDREA GORDON (A MINOR) SUING THROUGH HER MOTHER AND NEXT FRIEND TRIONA GORDON, ALLISON GORDON (A MINOR) SUING THROUGH HER MOTHER AND NEXT FRIEND TRIONA GORDON,

Plaintiffs

and

ESAT DIGIFONE LIMITED, IRELAND, THE ATTORNEY GENERAL, THE MINISTER FOR PUBLIC ENTERPRISE AND EMPLOYMENT, THE MINISTER FOR HEALTH AND THE MINISTER FOR THE ENVIRONMENT,

Defendants

SUPPLEMENTAL AFFIDAVIT OF ARTHUR FIRSTENBERG

I, Arthur Firstenberg, residing at 2610 Glenwood Road, Brooklyn, New York 11210, United States of America, aged eighteen years and upwards, make oath and say as follows:

1. I make this Supplemental Affidavit from facts within my own knowledge, save where otherwise appears and whereso otherwise appearing I believe the same to be true.

2. I won a Westinghouse scholarship award for laboratory research in electrophysiology, specifically potassium and amino acid transport, at Downstate Medical Center, State University of New York in Brooklyn, where I was a Research Fellow for 4 years, from 1966 through 1969.

3. I was a National Merit Scholar at Cornell University. I earned a bachelor's degree in 1971 with a major in mathematics, a minor in physics, and With Distinction In All Subjects.

4. I attended medical school at the University of California, Irvine, California College of Medicine from 1978 through 1982. I left in good standing, and ranked in the top half of my class. I left due to an illness which is pertinent to the matter which concerns this Court.

5. I was graduated from two schools of psychophysical integration in New York City, and have been in private practice since 1985 as a health consultant with special interest in electromagnetic injury.

6. I am a member of the national honor society Phi Beta Kappa.

7. My publications include, "The Effects of Radiant Energy on Living Organisms: A Review of the Literature," 19 pages, California College of Medicine 1981; a chapter in Ecotones: Creative Perspectives on Ecological Issues, Belinda Subraman, ed., Vergin Press, 1994; Microwaving Our Planet: The Environmental Impact of the Wireless Revolution, Cellular Phone Taskforce, 1996, 1997; and articles in journals such as Electrical Sensitivity News, Our Toxic Times, Heavy Metal Bulletin, Health Map Magazine, and Earth Island Journal.

8. I am President of the Cellular Phone Taskforce, a worldwide clearinghouse for reports and information about illness and injury caused by cellular phone base stations and other wireless facilities. I publish the Cellular Phone Taskforce newsletter, No Place To Hide.

9. In 1981 I was myself injured by electromagnetic radiation. Such injury terminated my medical career and rendered me

permanently vulnerable to electromagnetic radiation: a condition which is known as electrical sensitivity.

10. The U.S. Social Security Administration recognizes my electrical sensitivity as a permanent disabling condition. I collect Disability Benefits under U.S. law.

11. On November 15, 1996, personal communications services (PCS) base station antennas on hundreds of rooftops throughout New York City were turned up to full power. I experienced burning pain in my chest and my testicles, pressure behind my eyeballs, swollen throat, dry, puffy lips, slurred speech, joint pain, pain in the soles of my feet, memory loss, trembling, inability to eat, inability to sleep, dizziness, nausea, headache, and bronchial constriction, culminating in total muscular paralysis, including respiratory paralysis, which very nearly caused my death, on November 22, 1996. I immediately left my home and my city and cannot return. Nor can I set foot in any of hundreds of cities in the U.S. now covered by PCS systems, nor drive on highways monitored by Intelligent Transportation Systems, nor travel in trains monitored by radiofrequency scanners, without endangering my life.

12. The facts set forth in this Supplemental Affidavit, and in my Affidavit of the 7th day of November 1997, are from my own knowledge gathered from intimate personal experience, and from data gathered as President of the Cellular Phone Taskforce, and from my familiarity with the scientific literature and my expertise as a researcher and consultant in this field for 17 years.

13. I have been provided with a copy of the Affidavit of William H. Bailey and Linda S. Erdreich, sworn the 21st day of November 1997, together with their attached Report, Exhibit "A". I have studied the said Affidavit and Exhibit and have undertaken a comprehensive research and study of the

references contained therein. In response thereto, I say and believe the following:

A. In paragraph 6 of their Report, Drs. Bailey and Erdreich state, "Applicable studies include all of those with documented exposure to electromagnetic energy in the radio-frequency range." This has been the approach taken by the great majority of scientists who are setting international standards, and in my respectful opinion it is an erroneous approach. Cell phone base stations expose the population to average levels of radiofrequency radiation which are always less than 500 microwatts per square centimeter, and almost always less than 10 microwatts per square centimeter. Until about a year ago, average total exposures over the entire radiofrequency/microwave spectrum in most populated areas were no more than 1 or 2 nanowatts per square centimeter, which are all unquestionably what are usually known as "non-thermal" levels. It is in my view incorrect to evaluate the health effects of cell phone base stations by looking at the entirety of the scientific literature, the majority of which consists of studies done at levels of 1 milliwatt per square centimeter or more, where it is impossible to separate "thermal" from "non-thermal" effects in evaluating the results, or at even higher levels where the "thermal" effects will mask the "non-thermal" effects completely. I am of the firm view that an adequate evaluation of the applicable science can only be done by excluding all studies in which heating effects may come into play.

B. In paragraph 7 of their Report, Drs. Bailey and Erdreich make the unsupported statement that because of their low levels, "adverse effects could not be reasonably expected to occur as a result of these emissions." Their statement that "Mr. Firstenberg's conclusions are counter to those held by the majority of scientists that have experience in this field" is also unsupported. Some remarks of biologist Allan Frey are relevant here. He was involved

in both animal and human research on radiofrequency radiation for four decades, and discovered many important effects, including that of microwave hearing, which is now well accepted. He proved that 3 microwatts per square centimeter pulsed microwaves is enough to cause cardiac arrhythmias or even cardiac arrest in experimental animals. His work is meticulous and of the highest quality, and as a result has rarely been criticized, although its implications have been ignored. He complained in 1982 that very little information about the health effects of microwaves was reaching the public.

"The public certainly is not deluged with information," he wrote. "They have to fight for every piece they want and then cannot trust what little they do get. When they start putting these hard-won bits of information together, they find that there is a small group of scientists controlling the setting of health hazard standards, controlling what research bearing on that standard gets funded or published, while providing testimony for various companies and government agencies to the effect that substantial microwave energy exposure is safe. And they are doing it ostensibly as a commitment to the public interest, as Justesen put it when talking about COMAR. If the public is, as a result, suspicious, one can hardly argue that they are so without reason. They are, in fact, left with no recourse but the courts" (Frey, A.H., "From the laboratory to the courtroom: science, scientists, and the regulatory process," in Risk/Benefit Analysis: The Microwave Case, N.H. Steneck, ed., 1982, p. 215). I beg to refer to a copy of the quoted work by Frey, upon which, marked with the letters "AFS 1", I have signed my name prior to the swearing hereof.

C. In paragraph 7 Drs. Bailey and Erdreich claim that I failed to consider the issue of dose, and that I omitted important studies in my book, Microwaving Our Planet, which is Exhibit "A" in my Affidavit of 7 November 1997. In fact dose is the issue I most carefully considered above all else

in choosing the studies I reviewed: I only reviewed studies of exposure at intensities of 500 microwatts per square centimeter or less, for reasons set forth above, and deliberately excluded experiments at higher intensities because of the heating effects that come into play. As a result, my book is the only comprehensive review of the literature on exposure to exclusively non-thermal levels of radiofrequency radiation that has been published to date in the world, to the best of my knowledge.

D. Drs. Bailey and Erdreich allege that "nearly half" of the studies I review in my book were not published in scientific journals (paragraph 9); they imply that I include foreign literature "available only as brief abstracts in English" (paragraph 8); they claim that I rely on secondary sources (paragraph 9); and they complain that about half of my references are from before 1985 (paragraph 9). In fact, 200 out of my 234 references are to peer-reviewed scientific journals, government reports, textbooks, and symposium proceedings, with peer-reviewed journals in the majority. My use of secondary sources is rare. All of the foreign literature I cite is fully available in English translation, often in publications of the Joint Publications Research Service. The literature on low-level radiofrequency/microwave health effects begins in 1927 in the West, and in 1926 in the Soviet Union. No review of this body of literature would be adequate without a complete review of seven decades of work, not just the recent literature that is easily available in a Med-Line computer search. Quite the contrary: the existence of such an enormous body of literature dating continuously back from today to the 1920s supports my view that harm from radiofrequency radiation has been known and ignored for a very long time by the telecommunications industry, which continues to regulate itself without regard to such evidence.

E. In my Affidavit of 7 November 1997 I listed health effects I would expect in the vicinity of this Esat Digifone base station, if it became operational (paragraphs 3, 6, and 8 of my Affidavit). I based this assessment on my own personal and professional experience as well as the extensive literature I have reviewed from all over the world. Drs. Bailey and Erdreich claim in particular (paragraph 11 of their Report) that the Eastern European studies from 1979 to 1982 are of poor quality. This statement cannot be supported, nor is it supported in the documents cited by Drs. Bailey and Erdreich, i.e. EPA 1984 and WHO 1993.

F. The Eastern European studies I reviewed date continuously from 1960 to the present, and many are at least as detailed as to research methods, exposure levels, data collection procedures, and statistical analysis as studies from anywhere else. See, for example, the earliest Soviet work I reviewed, The Biological Action of Ultrahigh Frequencies, A.A. Letavet and Z.V. Gordon, 1960, a large review of data from hygienists, clinicians, physiologists, and specialists in radio electronics working cooperatively in a clinic and laboratory in Moscow over a period of 7 years. The first two chapters are devoted entirely to measurements, calculations, and descriptions of equipment. 525 patients participated. I beg to refer to a copy of this Soviet work, upon which, marked with the letters "AFS 2", I have signed my name prior to the swearing hereof.

G. A U.S. government review of the Soviet literature alone, "Soviet Research on the Neural Effects of Microwaves", done in 1966, revealed that at that time over 1000 works had been published on the biological and medical aspects of microwave radiation, and that the symptoms presently being reported to the Cellular Phone Taskforce--insomnia, dizziness, loss of appetite, headaches, loss of memory, trembling, cardiovascular disturbances, etc.--were being reported from exposure to low-

intensity microwaves as far back as 1933. The first conference on the subject was held in Moscow in 1940. I beg to refer to a copy of this government review, upon which, marked with the letters "AFS 3", I have signed my name prior to the swearing hereof.

H. Even 30 years ago, American scientists who bothered to read the Eastern European literature were impressed:

> "These studies have resulted in the accumulation of a large body of research data, which in aggregate cannot be ignored." (Janet Healer, "Review of Studies of People Occupationally Exposed to Radio-Frequency Radiations", in Symposium Proceedings. Biological Effects and Health Implications of Microwave Radiation, S. Cleary, ed., 1969, p. 95).
>
> "The reviewer cannot help but be impressed both by the consistency of the findings and the large size of Soviet and East European clinical and hygienic surveys which have involved literally thousands of people over the past 20 or more years." (Christopher Dodge, Biosciences Division, U.S. Naval Observatory, "Clinical and Hygienic Aspects of Exposure to Electromagnetic Fields", Ibid., p. 141).

I beg to refer to copies of the quoted works by Healer and Dodge, upon which, marked with the letters "AFS 4" and "AFS 5", respectively, I have signed my name prior to the swearing hereof.

I. A series of international scientific meetings and discussions in the late 1970s focused on the most profound difference between the Eastern European work and almost all the epidemiology that has been done in the West:

> "Most of the radiofrequency/microwave radiation human studies conducted in the East are based. . . on

actual examinations of the workers involved, usually by a team of medical specialists. The examination generally includes the completion by the examinee of a detailed questionnaire, which allows the examinee to describe any complaints or 'symptoms'. The team of medical specialists conducting the examination often includes an internist (or a physician specializing in occupational medicine) and a neurologist; an ophthalmologist is often involved, it is reported.

". . . In many instances, particularly in the military medical community, the individuals were brought into a hospital for several days so as to conduct the complete examination. On the other hand, most studies conducted in the West were based on questionnaires, and not on actual examination of the 'patients'." (Zory Glaser and Christopher Dodge, "Comments on occupational safety and health practices in the USSR and some East European countries: a possible dilemma in risk assessment of RF and microwave radiation bioeffects", in Risk/Benefit Analysis: The Microwave Case, N.H. Steneck, ed., 1982, pp. 57-58).

I beg to refer to a copy of the quoted work by Glaser and Dodge, upon which, marked with the letters "AFS 6", I have signed my name prior to the swearing hereof.

J. I beg to refer to copies of four Russian papers by Dumanskiy and co-workers, published between 1973 and 1982, and revealing the high quality and careful reporting of experimental design and analytical methods in animal experiments, upon which, marked with the letters "AFS 7", I have signed my name prior to the swearing hereof.

K. In paragraph 12 of their Report, Drs. Bailey and Erdreich state that Dr. Cherry and I both misinterpret the Mann and Röschke (1996) study, because the exposures were 400 times greater than that calculated from the proposed

Esat base station, and because the authors of that study state that the subjects did not report side effects. However, the Mann and Röschke study proves unequivocally that an exposure which is approximately 10 times lower than the international safety standard has definite neurological effects. This invalidates the standard, which is based on the non-existence of biological effects at these exposure levels. Side effects were also not assessed in this study, either by questionnaire or by physical or psychological examination. The authors state in their summary that neuropsychological tests for measuring cognitive functions should be performed in follow-up studies. I beg to refer to a copy of the Mann and Röschke (1996) study, upon which, marked with the letters "AFS 8", I have signed my name prior to the swearing hereof.

L. Drs. Bailey and Erdreich state in paragraph 13 of their Report that none of the citations on electrical sensitivity in my Affidavit of November 7 are from peer reviewed journals. In fact Knave (1992) is from Forskning & Praktik, April 1992, a journal of the National Institute of Occupational Health in Sweden. In addition the study of William Rea, M.D. ("Electromagnetic Field Sensitivity", 1991), cited on page 31 of my book, is published in the Journal of Bioelectricity.

M. Neither of the two studies on electrical sensitivity cited by Drs. Bailey and Erdreich in paragraphs 13 and 14 of their Report accurately evaluate their own data. The Andersson (1996) study, contrary to its own conclusions, shows a significant effect of the electromagnetic fields on both stress hormones and cholesterol. Both serum prolactin and serum cortisol fell to significantly lower levels after the provocation tests when the fields were off than they did when the fields were on. This is a comparison that the authors failed to make. The rise in cholesterol among the subjects given cognitive-behavioral therapy, noted with some puzzlement

by the authors, is consistent with reports in the literature noting a rise in cholesterol following exposure to electromagnetic radiation (see Klimkova-Deutschova 1974 and Sadchikova 1980, cited in Exhibit "A"). In the Andersson study, subjects given psychological therapy would have been less likely to avoid exposure, and would therefore have increased their exposure during the duration of the study, which would have caused their cholesterol to rise. I beg to refer to a copy of the Andersson (1996) study, upon which, marked with the letters "AFS 9", I have signed my name prior to the swearing hereof.

N. The extensive review of the literature by Bergqvist and Vogel (1997) also does not support the authors' conclusions. On page 5, they admit, "it has to be acknowledged that there are people with health problems of unknown origin that might become so severe that they quit their workplace and even change their entire life and move from their home in cities to rural areas." Again on page 13: "Some patients, however, report intolerable symptoms, most commonly pain or severe paralyzing fatigue if they do not avoid the vicinity of electromagnetic field sources." On page 13, the fact that not everybody has developed electrical sensitivity is wrongly given as a reason to doubt the effects of electromagnetic fields. For the entire population to succumb at once--whether it be to air pollution or lead or tobacco or asbestos or a virus or bacteria or ionizing or nonionizing radiation--is virtually unheard of in medicine. There is always a wide range of susceptibility. On page 14, the authors make the unfounded assumption that patients with these symptoms "usually have heard of electromagnetic hypersensitivity." Quite the contrary: most often they have suffered alone, sometimes for years, before they heard of electrical sensitivity for the first time and were relieved to know there were others with the same problem. On page 15, the case of P.S., who lives in an iron-sheeted room, is described.

P.S. is an individual I know personally, and his electrical sensitivity is quite real. It happens that since the introduction of digital high-frequency cellular service, his iron-sheeted room is no longer adequate, because it is protective only up to about 100 MHz.

In the summary on pages 16-20 the authors admit the existence of some biological effects: EEG changes, melatonin reduction, seborrheic eczema, non-specific erythema, alterations in prolactin and thyroxin levels. The actual studies reviewed in Appendix 3 are much more revealing. In every category of research they review, without exception, at least half, and usually the majority of the researchers report positive findings: 5 of 7 groups of investigators found a correlation between electromagnetic fields and depression, neurasthenia or similar symptoms; 3 of 4 researchers found a link between electromagnetic fields and suicide; 4 of 5 rodent studies showed a decrease in melatonin; 2 of 3 human studies showed an effect on melatonin and circadian rhythms; 4 of 7 researchers showed an effect on EEGs or ECGs; 2 of 2 studies showed an effect of mobile phones on EEGs and/or sleep; 11 of 13 reports correlated video display units with dermatitis; 11 of 13 epidemiological studies found skin disorders were related to video display units; 5 of 6 researchers found a link between skin problems and electromagnetic fields, and the only negative studies were done by Bergqvist himself; in electrically sensitive subjects, 3 of 4 researchers found effects on hormone levels; 3 of 3 found objective histopathological changes in the skin; 1 of 2 found effects on skin temperature; 6 of 12 provocation studies had positive or partly positive results; 3 of 5 researchers found decreased melatonin or increased light sensitivity.

The authors' biases are evident. They even appear to adopt the ludicrous position that even such effects as "heat or pain. . . can be considered 'physiological' rather than 'adverse'" (Appendix 3.13). This book is full of negative interpretations

of a literature survey that overwhelmingly indicates both the adverse impact of electromagnetic radiation on the average person's health and the existence of a segment of the population that is hypersensitive to electromagnetic radiation, including radiofrequency radiation such as is emitted by cellular phone transmitting antennas. I beg to refer to a copy of the Bergqvist and Vogel (1997) study, upon which, marked with the letters "AFS 10", I have signed my name prior to the swearing hereof.

O. The same author, Bergqvist, in a non-peer-reviewed setting, is the source of Drs. Bailey and Erdreich's conclusions about the shortwave transmitter near Berne, Switzerland (their Report, paragraph 14). This shortwave transmitter at Schwarzenburg was the subject of an official epidemiological study commissioned by the Swiss government in response to continued health complaints over a 20-year period by the residents of the surrounding community (Altpeter et al. 1995). The complaints are identical to those being reported from all over the world to the Cellular Phone Taskforce: insomnia, weakness, nervousness, joint and limb pain, disturbed concentration, heart palpitations, cough and sputum, shortness of breath, headache, dizziness, etc. The leader of the study, Theodor Abelin, is a medical doctor and the Head of the Department of Social and Preventive Medicine at the University of Berne. The 404 people who participated in this study underwent a health interview and personality tests, and kept health diaries during the summers of 1992 and 1993. Blood pressure and urine melatonin levels were also measured.

The results of this study, as Dr. Josef Mayr pointed out in the September/October issue of Microwave News, are sensational. Insomnia, nervousness and restlessness, limb and joint pain, general weakness and tiredness, cough and sputum, and abnormal blood pressure were found to be more frequent within 1.5 kilometers of the transmitter. Sleep

interruptions were found to be directly associated with the electromagnetic field strength of the transmitter, and sleep quality improved during a 3-day transmission shutdown, of which the study participants were not informed. The overall promotion rate of children from primary to secondary school during the 40 years of operation of the transmitter has been lower at a school near the transmitter than at one distant from it. Health effects were found even at average exposure levels of 38 nanowatts per square centimeter, which is more than 5,000 times lower than the IRPA/INIRC standard. I beg to refer to a copy of the Altpeter (1995) study, upon which, marked with the letters "AFS 11", I have signed my name prior to the swearing hereof.

P. A followup study by the same team has confirmed that sleep disturbances are strongly associated with exposure and distance from the transmitter, and that interference with sleep is occurring even where the average exposure levels are 2 nanowatts per square centimeter. This is 100,000 times lower than the international standard. I beg to refer to a copy of a poster abstract of this forthcoming study by Altpeter et al., upon which, marked with the letters "AFS 12", I have signed my name prior to the swearing hereof.

Q. A third, pilot study on cows in the area showed that stopping the transmitter was associated with a rise in melatonin levels in saliva, and that cows exposed to an average of 0.1 microwatts per square centimeter showed a phase shift in their daily melatonin cycle compared to unexposed cows far from the transmitter. I beg to refer to a copy of this study by Stärk et al. (1997), upon which, marked with the letters "AFS 13", I have signed my name prior to the swearing hereof.

R. As a result of the Schwarzenburg research, the Working Group on Non-Ionizing Radiation for the FOEFL

(Federal Office of Environment, Forests, and Landscape)--the very group which had previously recommended adopting the ICNIRP limits in Switzerland--changed its opinion and now regards these limits as not protective against chronic exposure. The FOEFL itself has recommended a nightly shutdown of the Schwarzenburg transmitter, and I understand Telecom of Switzerland is planning to remove the transmitter from Schwarzenburg in March 1998. I beg to refer to copies of the Opinion of the Working Group, in German and in English translation; the letter from the Director of FOEFL to the Schwarzenburg citizens group SchoK, in German and in English translation; and a letter of 8 December 1997 from Dr. Abelin; upon which, marked with the letters "AFS 14", I have signed my name prior to the swearing hereof.

S. In paragraph 15 Drs. Bailey and Erdreich rely on three studies, which I will address in turn.

(a) The citation to Djordjevic et al. (1973) is not the one given in their reference list. The article they cite in their reference list (Djordjevic 1979 [sic]) reports on an experiment on rats at an exposure level of 5 milliwatts per square centimeter, which is a very high exposure level and is not relevant to the levels which will come from the proposed Esat base station. This study also does not describe the experimental conditions, so it is not known whether the controls were near enough to the microwave generator to be affected by it--a possibility that is strongly suggested by the observation of leukocytosis in both the experimental and the control animals during the exposure period. I beg to refer to a copy of the Djordjevic (1977) study, upon which, marked with the letters "AFS 15", I have signed my name prior to the swearing hereof.

(b) The Lilienfeld (1978) study is a 450-page book which evaluates the health of employees at the U.S. embassy in Moscow which was irradiated by microwaves at an intensity of up to 15 microwatts per square centimeter beginning in

1953. This study's negative conclusions do not accurately reflect the data that it contains. To interpret them properly, one must realize that if microwave beams were aimed at any part of the embassy, no part of the embassy was "unexposed." Microwaves bounce off walls and penetrate them, are conducted through plumbing and wiring, and are re-radiated from metal objects. It is extremely difficult to design a room that shields them out. Therefore all references in this study to "unexposed" workers in Moscow must be read as "less exposed." The exact measurements are not contained in the 450 pages. The relevant data, hidden in Tables 6.20, 6.21, 6.31, 6.32, 6.34, 7.20, and 7.23, are spectacular. Male employees in the Moscow embassy developed symptoms more often than male employees in other Eastern European embassies in 19 out of 20 symptom categories. Furthermore, for the 21 most frequent medical diseases among the Moscow female employees, the incidence was higher in the Moscow embassy than in other embassies in 18 of the 21 conditions. Among male employees, the rates were higher in Moscow in 16 of the 20 most frequent conditions. For adult dependents, the rates were higher in Moscow in 18 of the 20 most frequent diseases. For dependent children, rates were higher in Moscow in 13 of 21 diseases.

Further, female employees in highly exposed areas of the Moscow embassy had more subjective complaints in 16 out of 19 symptom categories than female employees in less exposed areas. Male employees had <u>fewer</u> complaints in 18 of 20 symptom categories in the highly exposed areas than in the less exposed areas. The authors did not know what to make of this inverse correlation, but the finding is not bizarre. The Eastern European literature in particular mentions that an initial symptomatic period, lasting three years, may be followed by several years of adaptation, after which decompensation and continued progression of disease occurs. See for example page 142 of Exhibit AFS 5. It is also consistently reported that workers chronically exposed to very weak microwave radiation report symptoms with significantly greater frequency than those

chronically exposed to stronger radiation. The reason for the differing response of male and female employees in the Moscow embassy was not explored in the Lilienfeld study, and may well lie in a differing average length of exposure; however, the number of years at the embassy post for men and women is not given in the study. I beg to refer to a copy of the tables cited, upon which, marked with the letters "AFS 16", I have signed my name prior to the swearing hereof.

(c) The Robinette (1980) study is a faulty study because (1) no accurate assessment of individual exposure levels was undertaken, and (2) the control group, consisting of radio operators, radar operators, and aviation electrician's mates, is also an exposed group. I beg to refer to a copy of the Robinette study, upon which, marked with the letters "AFS 17", I have signed my name prior to the swearing hereof.

T. Drs. Bailey and Erdreich pay heavy attention to the issue of cancer (paragraphs 16, 17a, 17b, 18 and 19 of their Report). I pay little attention to cancer in my book, because, as I point out, the evidence for microwaves causing cancer is sparse (Microwaving Our Planet, page 16), and also because cancer is not the predominant problem in exposure to low-intensity microwaves. The predominant problem, for which there is enormously more evidence than for cancer, is that pulsed high-frequency microwaves are causing serious neurological and cardiac disease in masses of people. See, for example, Exhibits A, AFS 2, AFS 3, AFS 4, AFS 5, AFS 6, AFS 9, AFS 10, AFS 11, AFS 12, AFS 13, AFS 14, AFS 16, and AFS 23. In addition, the Cellular Phone Taskforce receives reports of illness and injury from exposure to radiofrequency radiation from cellular phone base stations regularly--we field approximately 30 to 40 such phone calls per week, and an equal amount of mail. To date we have heard from well over 1,000 individuals, doctors, nurses, and organizations in the United States, and a smaller number worldwide, reporting such illness or injury in their patients, their members, or themselves. The most common symptoms include insomnia,

dizziness, headache, nausea, dehydration, pressure behind the eyes, swollen thyroid, sudden increase in blood pressure, sudden change in pulse rate, loss of memory, loss of appetite, trembling, muscle spasms, coughing, wheezing, pressure or pain in the chest, pain in the legs or the soles of the feet, testicular or pelvic pain, and sometimes fever, rash, or nosebleeds. Some people report they feel like they are being electrocuted. There have been some deaths, subsequent to this syndrome, from brain hemorrhage or heart attack. An unknown number of people have been forced to flee their homes and their cities following the activation of massive numbers of antennas on apartment buildings and lampposts for digital PCS networks. I am taking care of one such refugee at this moment in my home: she arrived 8 days ago, and is just now calming down from her extreme agitation to where she is finally able to sleep at night. Her nervous system is still so raw that she can hardly tolerate sunlight, or even a 60 Watt light bulb, and she is aware of every wire that is in the walls of her room. Based on my own experience as a similar refugee from microwave radiation, it will likely be several months before she will be able to live without constant pain again, and tolerate regular society to any degree, and it is unlikely she will ever again be comfortable near a television or a computer during the remainder of her life. It is my experience, based on the hundreds of phone calls and letters that I receive, that the only way to recover from such illness, for those who are most sensitive, is to avoid exposure to all electricity for a period of time, to the extent possible, and certainly to avoid exposure to any radiofrequency radiation at all. Medications which calm the nervous system, such as tranquilizers and anti-epileptic drugs, can alleviate some of the symptoms to varying degrees, but they are totally ineffective at curing the disease, which was once known as radio wave sickness, and is more often called electrical sensitivity nowadays. The mandating by governments all around the world of universal digital cellular phone service will, if enforced as envisioned,

make it totally impossible for electrically injured people, especially people injured by radiofrequency radiation from cellular phone base stations, ever to recover and live normal lives, because there will literally be no escape from such radiation anywhere in the world. It is likely, in my opinion, that a very large number of such people will simply die. Physicians in the United States who treat the electrically injured, such as Dr. William Rea in Dallas, Texas, Dr. Gunnar Heuser in Thousand Oaks, California, and Dr. Grace Ziem in Baltimore, Maryland, have been giving my book, Microwaving Our Planet, to their patients to read, referring some of their patients to me, and consulting me for my expertise. I am not aware that any of them has found a successful treatment for this illness other than avoidance of exposure.

Radio wave sickness has been recognized as a compensable occupationally caused disease by a Court in my home state of New York. I beg to refer to a copy of said court case, Yannon v. New York Telephone Company, 86 AD 2d 241, upon which, marked with the letters "AFS 18", I have signed my name prior to the swearing hereof.

U. In paragraph 20 of their Report, Drs. Bailey and Erdreich address an important issue: that of dose-response. However they appear to have failed to review the relevant literature, or if they did, apparent dogmatic principles have prevented their evaluating it properly. It is in fact not always the case in toxicology that a higher dose means a greater biological response, and it is certainly not always the case that there is always a no-observed-adverse-effect-level. Indeed ionizing radiation does not follow either of these rules. Nonionizing radiation has been shown to also produce a similar biphasic response in organisms (Oscar and Hawkins 1977, Balcer-Kubiczek 1994, and Bawin et al 1970, cited on p. 40 of Microwaving Our Planet, Exhibit A). The June 1994 report of the Australian Commonwealth

Scientific and Industrial Research Organization (CSIRO), "Status of Research on Biological Effects and Safety of Electromagnetic Radiation: Telecommunications Frequencies", states on page 73 that "There is a flaw in the notion that applies 'safety' standards that only refer to measurable gross physical quantities. When considering biological consequences it is essential to understand that the extreme lethal levels can be less harmful to the organism/individual than a seemingly negligible change that modifies the behaviour and development of cells."

V. In paragraph 21 of their Report Drs. Bailey and Erdreich challenge my statement that there is no threshold for microwave effects on the nervous system and the heart and claim, wrongly, that I did not provide substantiation. See Kondra et al. (1970, 1972), showing effects on reproduction of chickens at 0.00000002 microwatts per square centimeter; Selga and Selga (1996), showing premature aging and effects on seed germination in pine trees at 0.000024 microwatts per square centimeter; Marha (1969) reporting effects on cell division in plants at 0.0000000026 microwatts per square centimeter (cited on pp. 18, 21, and 22 of Microwaving Our Planet). In addition to the studies cited in my book, there is elegant and precise work going on by teams of researchers in Russia and Germany that does tend to indicate the truth of what Drs. Bailey and Erdreich seemed to find so unbelievable: that "our bodies are at least as sensitive to radiowaves from distant stars as are the enormously sensitive (and expensive) electronic equipment used by astronomers." I beg to refer to a copy of a 1996 study by I.Y. Belyaev et al., "Resonance Effect of Millimeter Waves in the Power Range From 10^{-19} to 3×10^{-3} W/cm^2 on Escherichia coli Cells at Different Concentrations", upon which, marked with the letters "AFS 19", I have signed my name prior to the swearing hereof. These researchers have found direct interactions of millimeter microwaves at precise frequencies with the genetic

material of cells, and they have found that the magnitude of the effect does not change, all the way down to a power density of 10^{-19} Watts per square centimeter. Indeed they have found certain frequencies of microwave radiation that alter the genome conformational state at power densities between 10^{-8} and 10^{-16} Watts per square centimeter, but have no such effect at higher powers, whereas other frequencies remain effective at higher power levels as well. The effect is precise, predicted by theory, and reproducible.

The other team of researchers, in Germany, has been refining their work for two decades. I beg to refer to a copy of the 1992 article by Grundler and Kaiser, "Experimental Evidence for Coherent Excitations Correlated with Cell Growth", upon which, marked with the letters "AFS 20", I have signed my name prior to the swearing hereof. As in the work of Belyaev et al., the biological effect of millimeter microwave radiation at precise frequencies did not vary in magnitude, regardless of the power density to which cells were exposed. The frequency peaks at which these resonance effects occurred, however, narrowed as the intensity decreased--a result also found by Belyaev et al. Here the organisms were yeast cells, and the effect was a change in the rate of cell growth. Particular frequencies slowed the rate of growth by half for individual cells. Again results were predicted by theory, and the authors noted "that in this model even intensities near to zero can be active" (page 173). In their experiments the magnitude of the effect on cell growth was the same at 10 milliwatts per square centimeter, at 1 microwatt per square centimeter, at 1 nanowatt per square centimeter, and at 5 picowatts per square centimeter (Figure 12, page 174), while the resonance frequency narrowed considerably at lower intensities.

Ross Adey, M.D., Associate Chief of Staff for Research and Development at the Pettis Memorial Veterans Administration Medical Center, in Loma Linda, California, testified in the United States Senate about this research:

"The definitive findings are the product of a single team of highly competent German scientists who have collaborated for the past 15 years within the framework of the prestigious Max Planck organization, and, crucially, their work has shown altered cell growth with millimeter wave fields at levels of 5 picowatts per centimeter squared, about one million times below field levels permitted under ANSI/IEEE guidelines for millimeter wave exposure.

"Moreover, they conclude that these fields can exert effects even at intensities near zero, in other words, a lower limit or threshold may not exist."

I beg to refer to a copy of Dr. Adey's testimony, upon which, marked with the letters "AFS 21", I have signed my name prior to the swearing hereof.

W. In paragraph 22 Drs. Bailey and Erdreich refer to the Tofani (1986) study I cite as a "single aberrant study" showing effects on reproduction. They ignore Ouellet-Hellstrom and Stewart (1993), Huai (1979), Kolodynski and Kolodynska (1996), Navakatikian and Tomashevskaya (1994), Krueger and Giarola (1975), Bigu del Blanco (1973), Kondra et al. (1970, 1972), Il'chevich and Gorodetskaya/McRee (1980), and Gordon (1974), all of whom I also cite. The only study cited by Drs. Bailey and Erdreich is one by Lary and Conover (1982). This study is at grossly thermal levels of 24 milliwatts per square centimeter which heated up the experimental animals to a temperature of 43°C, and which therefore has no bearing here. The claim of Drs. Bailey and Erdreich that "Reviewers who have conducted comprehensive reviews of the research literature have concluded that only exposures associated with heating

are linked to reproductive risks" is not correct. See, for example, the NCRP (1986) criticism that differentiating thermal from athermal effects is problematic because "many of the authors who reported defects have employed acute, highly intense irradiation that obviously has placed a thermal burden on the irradiated subject" (Biological Effects and Exposure Criteria for Radio-frequency Electromagnetic Fields, National Council on Radiation Protection and Measurements, Report #86, April 1986, p. 65, cited in Microwaving Our Planet).

X. A new, important study on reproductive effects has been reported by Magras and Xenos (1997) in the journal Bioelectromagnetics. This study consisted of radiofrequency level measurements and in vivo experiments at several places around an antenna park in Greece. Twelve pairs of mice, divided in two groups, were placed in locations of different power densities and were repeatedly mated five times. One hundred eighteen newborns were collected. A progressive decrease in the number of newborns per dam was observed, which ended in total and irreversible infertility by the fifth generation, at both experimental locations, whereas under identical conditions at a location 10 kilometers away from the antenna farm, normal fertility was maintained throughout all five generations. The experimental locations were: a wildlife refuge near the antenna park, where the measured power density was 168 nanowatts per square centimeter; and the third floor of a public primary school 1.5 kilometers away, where the measured power density was 1.053 microwatts per square centimeter, and where total irreversible infertility occurred by the third generation. I beg to refer to a copy of this study of Magras and Xenos, upon which, marked with the letters "AFS 22", I have signed my name prior to the swearing hereof.