



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

136 Main Street, Suite 401
New Britain, Connecticut 06051
Phone: 827-7682

FILE
COPY

July 18, 1991

Peter J. McDonald
Vice President
Litchfield County Cellular, Inc.
777 East Main Street
Torrington, CT 06790

RE: Litchfield County Cellular, Inc., notice of intent to modify an existing non-facility telecommunications tower and associated equipment in the City of Torrington, Connecticut.

Dear Mr. McDonald:

At a public meeting held on July 16, 1991, the Connecticut Siting Council (Council) ruled that this facility would not cause a significant change or alteration in the physical and environmental characteristics of the site for placement of six cellular telecommunication antennas at the 205 foot level of the existing non-facility telecommunications tower and acknowledged your notice of intent to modify this existing non-facility telecommunications tower and associated equipment located at 1210 Highland Avenue, Torrington, Connecticut, pursuant to Section 16-50j-73 of the Regulations of State Agencies (RSA).

The three or fewer microwave dishes that were to be placed on the non-facility telecommunications tower were not approved as an exempt modification by the Council because this equipment was considered speculative given that the microwave paths associated with the dishes have not yet been established. The Council would reconsider these microwave dishes if and when final design and need for this equipment has been determined.

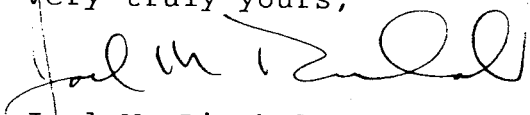
The proposed modifications are to be implemented as specified in your notice dated June 21, 1991. As proposed, the modifications are in compliance with the exception criteria specified in RSA 16-50j-72 as changes to an existing non-facility site that do not increase the tower height, extend

the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels or more, add radio frequency sending or receiving capability which increases the total radio frequency electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to Section 22a-162 of the Connecticut General Statutes, and has received all municipal zoning approvals and building permits.

The Council is pleased to note that the shared use of an existing tower serves the Council's long-term goal of protecting the public interest by avoiding proliferation of additional tower structures.

Please notify the Council upon completion of construction.

Very truly yours,



Joel M. Rinebold
Executive Director

JMR/cp

cc: Timothy S. Hollister, Esq.
Andrew N. Davis, Esq.

5443E

ORIGINAL

LOUIS R. PEPE
STEPHEN B. HAZARD
RICHARD D. JONES
WALTER W. SIMMERS
JAMES G. GREEN, JR.
JAMES A. THOMPSON, JR.
ALLAN J. KLEBAN
DAVID E. ROSENGREN
ROBERT C. HUNT, JR.
MICHAEL A. ZIZKA
GERALD LABRIOLA, JR.
TIMOTHY S. HOLLISTER
THOMAS G. LIBRIZZI
DAVID J. SPIEGEL
JAMES C. GRAHAM*
WILLIAM C. BRUCE*
ANN F. BIRD
KATHLEEN F. BORNHORST
LAWRENCE G. ROSENTHAL†

JEANINE M. DUMONT
JAMES J. MERCIER
JOEL B. BENJAMIN
LAWRENCE E. MERLIN
PATRICK J. LAPERA
PETER E. HAPKETT
PAUL T. FITZPATRICK
KEVIN W. GILLEN
CAROL L. LEAR
SUSAN C. RAY
RONALD F. OCHSNER
MARY A. GLASSMAN
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JAMES M. SCARAMOZZA
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LANA M. GLOVACH
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SHARON W. HECKER
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ROBERT M. BARRACK
ANDREW N. DAVIS
JO ANN M. JORGE
JAMES P. JULIANO
ANTHONY J. NATALE
JEFFREY G. TOUGAS
COLLEEN M. WOLTER

LAW OFFICES

GOODWIN SQUARE
HARTFORD, CONNECTICUT 06103-4302
203/522-5175 FACSIMILE 203/522-2796

*COUNSEL
†ADMITTED IN MARYLAND, TEXAS AND DISTRICT OF COLUMBIA ONLY
‡ADMITTED IN MINNESOTA ONLY

June 21, 1991

HAND-DELIVERY

The Hon. Mortimer A. Gelston, Chairman,
and Members
Connecticut Siting Council
136 Main Street, Suite 401
New Britain, CT 06051

RECEIVED

JUN 21 1991
CONNECTICUT
SITING COUNCIL

RE: Litchfield County Cellular, Inc.: Notice of Intent to Construct Exempt Modification, 1210 Highland Avenue, Torrington, Connecticut

Dear Chairman Gelston and Members of the Siting Council:

Pursuant to Conn. Agencies Regs. § 16-50j-73, please find enclosed a "Notice of Intent to Construct Exempt Modification," filed on behalf of our client, Litchfield County Cellular, Inc. ("LCC"). LCC proposes to modify an existing, non-facility tower which will constitute the initial component of a cellular telephone system which will serve Rural Service Area ("RSA") No. 357 Connecticut 1 - Litchfield. We expect to file an application for a Certificate of Environmental Compatibility and Public Need for the balance of the RSA later this year.

The attached Notice involves an existing non-facility tower located at 1210 Highland Avenue, Torrington, Connecticut.

In support of this Notice, and pursuant to Conn. Agencies Regs. § 16-50j-12, we have filed 20 copies of the Notice and attached Appendices in addition to the original. Please note, however, that with the permission of the Council's staff, only the original and three copies contain Appendix B, an A-2 boundary survey of the subject property, and Appendix D, a Proposed Site Development Plan. We will be happy to provide additional copies of these materials upon your request.

Sincerely,

LITCHFIELD COUNTY CELLULAR, INC.

By: *Timothy S. Hollister*
Timothy S. Hollister
Andrew N. Davis

PEPE & HAZARD
Goodwin Square
Hartford, CT 06103-4302
203/522-5175

Its Attorneys

cc:

The Hon. Delia R. Donne, Mayor
City of Torrington
Joel M. Rinebold, Executive Director
Connecticut Siting Council
Hugo and Regina Gerbi
Kenneth L. Ramsey, President
Litchfield County Cellular, Inc.
Peter J. McDonald, Vice President
Litchfield County Cellular, Inc.
Robert J. Jontos, Jr., President
Land-Tech Consultants, Inc.
Louis Gurman, Esq.
Gurman, Kurtis, Blask & Freedman
John P. DiCara
DiCara Land Surveying Services
Shelton P. Hobbs, Product Engineer
Crispaire
Myron C. Noble, P.E., President
PiRod, Inc.

ORIGINAL

RECEIVED

JUN 21 1991

CONNECTICUT
SITING COUNCIL

CONNECTICUT SITING COUNCIL

LITCHFIELD COUNTY CELLULAR, INC.

NOTICE OF INTENT TO
CONSTRUCT EXEMPT MODIFICATION

DOCKET NO. _____

JUNE 21, 1991

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

IN RE:

LITCHFIELD COUNTY CELLULAR, INC.,) DOCKET NO. _____
CONSTRUCTION AND OPERATION OF)
FACILITIES TO PROVIDE CELLULAR)
SERVICE IN RSA NO. 357) JUNE 21, 1991
CONNECTICUT 1 - LITCHFIELD)

NOTICE OF INTENT TO CONSTRUCT EXEMPT MODIFICATION

I. INTRODUCTION

This notice of intent to construct an exempt modification ("Notice") and the exhibits accompanying it are submitted by Litchfield County Cellular, Inc. ("LCC") to the Connecticut Siting Council ("Council") pursuant to Conn. Agencies Regs. § 16-50j-73. LCC is a Delaware corporation qualified to do business in the State of Connecticut with its principal business office located at 777 East Main Street, Torrington, CT 06790. LCC has been designated the non-wireline cellular carrier by the Federal Communications Commission ("FCC") in Rural Service Area ("RSA") No. 357, Connecticut 1 - Litchfield (FCC File No. 10940-CL-CP-89, approval issued August 14, 1990; and FCC File No. 07937-CL-MP-91, Modification Authorization, issued April 15, 1991). This Notice describes LCC's intent to modify an existing tower by attaching cellular antennas and associated equipment and to construct an accessory telecommunications equipment building located on the property known as 1210 Highland Avenue located in Torrington, Connecticut. An Application for a Certificate of Environmental Compatibility and Public Need will subsequently be submitted by LCC to the Council in order to expand LCC's cellular facilities and to provide Domestic Public Cellular Radio Telecommunication Service throughout the Connecticut 1 - Litchfield RSA.

LCC has determined that the tower to which it will be attaching its cellular antennas and associated equipment is not within the purview of the Council's definition of "facility" per Conn. Gen. Stat. § 16-50(i)(a). This conclusion is based upon a list, which the owner of the site has provided to LCC (see Appendix A), of radio communications equipment currently located on the tower. Reviewing this information in the context of the Council's regulations, LCC has determined that none of this equipment is cellular equipment which would bring this tower within the Council's definition of "facility." In addition, we have examined LCC's proposed activities in light of the Council's regulations and have concluded that they are within the Council's jurisdiction and may be permitted by filing a Notice of exempt modification to a non-facility tower in compliance with the provisions set forth at Conn. Agencies Regs. § 16-50-72(c)(1)-(5).

Correspondence in regard to this Notice should be addressed to:

Peter J. McDonald, Vice President
Litchfield County Cellular, Inc.
777 East Main Street
Torrington, CT 06790
203/489-9999

with a copy to:

Timothy S. Hollister, Esq.
Andrew N. Davis, Esq.
Pepe & Hazard
Goodwin Square
Hartford, CT 06103
203/522-5175

II. SITE DESCRIPTION

A. General Information

The Torrington site, owned by Hugo and Regina Gerbi, is located at 1210 Highland Avenue and occupies the eastern limits of the dominant ridgeline. The 5.7 acre parcel is accessed via a 160 foot long and 40 foot wide graveled right of way that exits north from Highland Avenue. This entrance is approximately 400 feet east of the intersection of Highland Avenue and Westside Street. A copy of the A-2 survey is provided in Appendix B.

Topographically the site lies at an elevation of approximately 1230 feet above mean sea level. On-site slope conditions range from 0-3 percent. Soils are characterized by the Soil Conservation Service generalized soil mapping as well drained Paxton soils.

The site currently supports four radio communications towers of various heights ranging from 100 feet in height to the tallest which is 260 feet in height. See A-2 survey at Appendix B. Each tower has a building associated with it which houses the associated radio communications equipment.

The perimeter of the site is planted with an evergreen screen composed of 15 to 20 foot high spruce and pine trees, thus effectively screening the view of the accessory buildings and tower base from the adjacent residents. The interior of the site is an open meadow dominated by coarse grasses and sporadic plantings of sapling sized red pine.

This area of Torrington is currently zoned residential (R-40) with a minimum lot size of 40,000 square feet. The area had previously been zoned R-15. The tower site is abutted on the south and west by single family residential structures. With the exception of one residence, the property to the east and north of the site is undeveloped secondary

growth, mixed deciduous forest land.

B. Scenic Considerations

The well-developed evergreen screening and moderate westward sloping topographic condition obscures the view from the rear of the residences along Westside Street. Views from these residences are predominantly directed to the west, southwest, and north depending on their location on the street. Residences to the south of the site, along the north side of Highland Avenue, have their northern perspective blocked by the evergreen buffer. The single residence to the east is topographically lower than the tower site, and its vista is not affected.

III. PROPOSED SITE DEVELOPMENT

A. Modifications to Existing Tower

The LCC antennas will be attached to the 260' tower identified on the A-2 survey in Appendix B. Copies of the relevant approvals obtained by the Gerbi's for the construction and operation of the 260' tower are provided in Appendix C. The LCC cellular antennas will be located on the tower 205' off the ground, and the microwave dishes will be placed at the 100' level. As referred to above, the 260' tower supports the antennas and associated equipment identified by the owner of the tower (see Appendix A).

B. Construction of Support Building

A single story 12' X 20' modular structure will be located on site. A copy of the proposed site development plan is included as Appendix D. The location of the structure is indicated on the attached site plan. The structure will house the electrical components for the telecommunications system. An auxiliary portable generator will be situated outside the structure on a concrete slab to supply electricity to the system during power outages. No water use fixtures are proposed. In satisfaction of Conn. Agencies Regs. § 16-50j-72(c)(2), the construction of the building will in no way extend the boundaries of the site.

C. Municipal Zoning and Building Approvals

LCC has obtained municipal zoning and building approvals and permits (see Appendix E) which fulfill the requirements of Conn. Agencies Regs. § 16-50j-72(c)(5). Such approvals and permits are evidenced by the following documents:

- (1) Memo from Dan McGuinness, Torrington City Planner, Recommendation to Planning and Zoning Commission to grant Special Exception (dated 3/12/91);
- (2) City of Torrington Planning and Zoning Commission "Zoning Board of Appeals - Special Exception Referral,"

recommendation of approval of Special Exception to ZBA (copy of 3/13/91 minutes attached);

- (3) City of Torrington ZBA Special Exception (Section 200 Special Exception, Subsection L and Section 606B.3) to place antennas on the existing tower and construct an accessory telecommunications building in R-40 zone (certified June 3, 1991);
- (4) City of Torrington Zoning Permit No. 2232 (dated June 7, 1991);
- (5) City of Torrington Building Permit No. 12874 (dated June 7, 1991) to construct 12' x 20' equipment building.

IV. POTENTIAL ENVIRONMENTAL IMPACTS

In satisfaction of Conn. Agencies Regs. § 16-50j-72(c)(1), the following demonstrates that the activities proposed by LCC will not cause a significant change or alteration in the physical and environmental characteristics of the site.

A. Air and Water Discharges

The use of the emergency electrical generator is expected to be infrequent. Thus, the emission of exhaust fumes will not adversely impact air quality on or adjacent to the site. LCC anticipates no water discharges from the facility.

B. Noise

The proposed structure is located near the center of the site, some 300+ feet from the nearest dwelling. The only noise associated with on-site activities will be during construction of the structure and during periods of emergency generator use (see also section V.B. below). Construction of the one story structure is anticipated to require 4 to 6 weeks. Noise associated with the emergency generator will be infrequent and diminished by the building location, position, and well developed stand of evergreens.

C. Soil and Vegetation

Soil disturbances can be expected during the construction of the foundation and one story structure. An area of 25 feet beyond the limits of the foundation will also be disturbed as a result of construction of the building and access/parking area. The limits of site disturbance, including soil stockpile and equipment storage areas and gravel accessway limits will be field delineated by fabric sediment fence.

Due to the site's gentle topographic condition, well-drained soils, established meadow grass cover, and field-delineated limits of disturbance, significant negative environmental impacts on soil erosion

and vegetative cover resulting from construction activities are not expected. No wetlands soils have been identified on site.

V. ENGINEERING ISSUES

A. Model of Radiofrequency Electromagnetic Radiation Power Densities

In satisfaction of Conn. Agencies Regs. § 16-50j-72(c)(4), the purpose of this subsection and Appendix F is to show that the electromagnetic radiation introduced by the proposed LCC activities will not increase the power density levels at the property boundaries beyond the standards accepted by the Connecticut State Department of Environmental Protection ("DEP"). The standards adopted by the DEP are those which were compiled by the American National Standards Institute ("ANSI").

The steps taken to calculate power density levels generated by the existing and proposed facilities were outlined in OST Bulletin No. 65. This bulletin, entitled "Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radiofrequency Radiation," was prepared in October of 1985 by Robert F. Cleveland, Technical Analysis Division, Office of Science and Technology, Federal Communications Commission, Washington, D.C.

The results of a worst-case analysis show that the modifications proposed by LCC will not increase the total radiofrequency electromagnetic radiation power density level at any property boundary beyond the level accepted by the DEP. This fact is substantiated by the calculations in Appendix F. It should be noted that the results of the analysis, considered worst-case, do not exceed the DEP standards. The LCC analysis took into account all services which are presently operating on the premises and also those facilities which are scheduled to commence operation before LCC's proposed installation.

As a final justification for LCC's proposed installation, the FCC, in the Report and Order GEN. Docket No. 79-144 adopted on February 12, 1987 (attached for reference in Appendix F), declared cellular, microwave point-to-point radio, and other land-mobile and fixed communications services to be categorically excluded from radiofrequency radiation evaluation. Nonetheless, the present study was conducted to demonstrate that the proposed facility will not increase the cumulative radiofrequency electromagnetic radiation to a level that would exceed the DEP standards.

B. Model of Noise Levels in satisfaction of Conn. Agencies Regs. § 16-50j-72(c)(3)

Within this subsection it is demonstrated that the facility proposed by LCC will not generate noise levels in excess of six decibels (6dB) above ambient as measured at the property boundaries. This standard has been established by the Connecticut DEP.

The installation proposed by LCC will consist mostly of solid state equipment housed in a concrete-based modular building. Characteristically, this type of equipment, having no moving parts, produces no noise. However, in order to keep the equipment operating in a reliable and consistent manner, the temperature inside the building must be kept within a specific range. For this purpose, a cooling system will be employed.

The cooling system will consist of two (2) wall-mounted Marvair model AVP 36 Compac I units which are manufactured by Crispaire. This dual system is configured in a redundant operating mode to ensure that the proper temperature can be maintained in the event of a failure in either unit.

Recent tests have been conducted on the proposed air conditioners by the manufacturer. The results presented in Appendix G were obtained by measured noise levels at various distances from a unit which was operating in the maximum cooling mode. The total noise registered at a particular location was compared with the ambient noise level measured for that position, allowing the noise contribution of the unit to be determined.

Because the tower to which LCC proposes to install its cellular antennas and associated equipment is located near the center of the subject property, the air conditioning units will be positioned more than 200 feet from the nearest boundary. The test results demonstrate that even at distances of less than 100 feet the ambient noise level will not be increased by 6 dB. Furthermore, from a distance of 200 feet, the contribution the unit makes to the ambient noise level is negligible (compare sound level values of Tables 1 and 3 in Appendix G) and certainly does not exceed the 6 dB standard adopted by the Connecticut DEP.

Please note that, during the actual construction period, noise levels may be temporarily increased due to the presence of other machinery and personnel on site necessary for the proper installation of the proposed facility. However, LCC will ensure that operations are conducted in a responsible and sensible manner in order to minimize disturbance.

C. Engineering Analysis of Tower's Fall Zones

Based on an engineering analysis as expressed in the PiRod, Inc. letter dated May 9, 1991 (copy attached as Appendix H) in the event of a tower failure, all materials/associated equipment would fall safely within the subject property as shown.

D. Engineering Analysis of Tower's Structure and Capability to be Modified

Based on an engineering analysis as expressed in the PiRod, Inc. letter dated May 9, 1991 (copy attached as Appendix I), the tower proposed to be modified to support the LCC antennas and associated

equipment is fully capable of supporting said antennas and equipment.

VI. CONCLUSION

For the foregoing reasons, LCC has determined that the proposed alterations to the existing tower and construction of the building to house the associated cellular equipment will not cause a significant change or alteration in the physical and environmental characteristics of the site and satisfy all requirements of Conn. Agencies Regs. § 16-50j-72(c)(1)-(5). Therefore, LCC's placement of cellular antennas and associated equipment on the existing tower constitutes a modification within the meaning of the regulations that is exempt. LCC respectfully urges the Council to make such a finding.

WHEREFORE, LCC respectfully requests that the Council affirm its Notice of Intent to Construct an Exempt Modification Facility.

Respectfully submitted,

LITCHFIELD COUNTY CELLULAR, INC.

By: *Timothy S. Hollister*

Timothy S. Hollister
Andrew N. Davis

PEPE & HAZARD
Goodwin Square
Hartford, CT 06103
203/522-5175

Its Attorneys

INDEX TO APPENDICES

- APPENDIX A. List of radio communications equipment located on existing 260' tower; information provided by Hugo S. Gerbi, property owner; compiled on 4/30/91 by James C. Egyud, Consulting Engineer, Gurman, Kurtis, Blask & Freedman, Suite 500, 1400 16th St., N.W., Washington, D.C. 20036 (202/328-8200).
- APPENDIX B. A-2 Survey of 1210 Highland Avenue, Torrington, CT; prepared by DiCara Land Surveying Services, Winsted, CT (certified by John P. DiCara, LS # 14207; 3/25/91).
- APPENDIX C. Municipal and federal approvals and permits obtained by Hugo S. Gerbi for the construction and maintenance of the 260' tower at issue:
- (1) City of Torrington ZBA Special Exception to construct 260' tower and accessory building (granted 5/14/90);
 - (2) Certificate of Special Exception;
 - (3) City of Torrington Zoning Permit No. 2119 (2/14/91) and Plot Plan;
 - (4) City of Torrington Building Permit for Radio Tower & Housing, Permit No. 12726 (3/15/91);
 - (5) FAA Acknowledgement of Notice of Proposed Construction or Alteration (No. 90-ANE-137-OE) (5/18/90);
 - (6) FAA Notice of Actual Construction or Alteration (No. 90-ANE-137-OE) (7/11/90).
- APPENDIX D. Proposed Site Development Plan for 1210 Highland Avenue, Torrington, CT; prepared by Land-Tech Consultants, Inc., 205 Playhouse Corner, Southbury, CT 06488 (prepared by Michael J. Bartos, Jr., P.E.; 3/6/91; revised 4/24/91).
- APPENDIX E. Municipal zoning and building approvals and permits obtained by LCC for activities proposed in this Notice:
- (1) Memo from Dan McGuinness, Torrington City Planner, Recommendation to Planning and Zoning Commission to grant Special Exception (dated 3/12/91);

- (2) City of Torrington Planning and Zoning Commission "Zoning Board of Appeals - Special Exception Referral," recommendation of approval of Special Exception to ZBA (copy of 3/13/91 minutes attached);
- (3) City of Torrington ZBA Special Exception (Section 200 Special Exception, Subsection L and Section 606B.3) to place antennas on the existing tower and construct an accessory telecommunications building in R-40 zone (certified 6/3/91) (also attached is a copy of the Special Exception recorded with the Torrington Land Records);
- (4) City of Torrington Zoning Permit No. 2232 (dated 6/7/91);
- (5) City of Torrington Building Permit No. 12874 (dated 6/7/91) to construct 12' x 20' equipment building.

APPENDIX F. Analysis and model of radiofrequency radiation power densities; prepared on 5/8/91 by Brent R. Shirey, Consulting Engineer, Gurman, Kurtis, Blask & Freedman, Suite 500, 1400 16th St., N.W., Washington, D.C. 20036 (202/328-8200). Also attached is FCC Report No. DC-838.

APPENDIX G. Analysis and model of noise levels; prepared on 5/15/91 by Shelton P. Hobbs, Product Engineer and Douglas M. Bodrey, Vice President of Engineering, Crispaire, P.O. Box 400, Cordele, GA 31015 (912/273-3636).

APPENDIX H. Engineering analysis of 260' tower's fall zones; prepared by Myron C. Noble, P.E., President, PiRod, Inc., 1200 N. Oak Road, P.O. Box 128, Plymouth, IN 46563-0128 (219/936-4221) (dated 5/9/91).

APPENDIX I. Engineering analysis of 260' tower's structure and capability to be modified; prepared by Kenneth E. Blessing, Jr., V.P., PiRod, Inc., 1200 N. Oak Road, P.O. Box 128, Plymouth, IN 46563-0128 (219/936-4221) (dated 5/9/91).

APPENDIX A.

List of radio communications equipment located on existing 260' tower; information provided by Hugo S. Gerbi, property owner; compiled on 4/30/91 by James C. Egyud, Consulting Engineer, Gurman, Kurtis, Blask & Freedman, Suite 500, 1400 16th St., N.W., Washington, D.C. 20036 (202/328-8200).

Gerbi Communication
260' PiRod Tower Transmission Equipment

<u>Frequency (MHz)</u>	<u>Antenna Model</u>	<u>Transmission Line</u>	<u>Tower Location</u>
*Motorola (Receive) 820.2875, 819.2875, 818.2875, 817.2875, 816.2875	Sinclair SRL 480*1 (14')	7/8" (1 run) 1/2" (1 run)	260'
TV Lab (Receive) 468.275	Celwave PD 455-7	1 1/4" (2 runs)	260'
TV Lab (Transmit) 463.275	Celwave PD 458-2	1 1/4" (1 run)	220'
Page America 931.43125 (Receive)	Celwave PD-10017	1 5/8" (1 run)	260'
Page America 931.6125 (Transmit)	Celwave PD-1108	1 1/4" (1 run)	220'
FM Broadcast 97.3 (Transmit)	4-bay circular polarization	1 5/8" (1 run)	120'

* Uses pre-amp weighing 55 lbs. at 260' level

APPENDIX B. A-2 Survey of 1210 Highland Avenue, Torrington,
CT; prepared by DiCara Land Surveying Services,
Winsted, CT (certified by John P. DiCara, LS #
14207; 3/25/91).

APPENDIX C. Municipal and federal approvals and permits obtained by Hugo S. Gerbi for the construction and maintenance of the 260' tower at issue:

- (1) City of Torrington ZBA Special Exception to construct 260' tower and accessory building (granted 5/14/90);
- (2) Certificate of Special Exception;
- (3) City of Torrington Zoning Permit No. 2119 (2/14/91) and Plot Plan;
- (4) City of Torrington Building Permit for Radio Tower & Housing, Permit No. 12726 (3/15/91);
- (5) FAA Acknowledgement of Notice of Proposed Construction or Alteration (No. 90-ANE-137-OE) (5/18/90);
- (6) FAA Notice of Actual Construction or Alteration (No. 90-ANE-137-OE) (7/11/90).

City of Torrington



Zoning Board Of Appeals
Municipal Building
Torrington, Connecticut 06790

William W. Stoeckert,
Chairman
Room 317

May 24, 1990

Mr. & Mrs. Gerbi
183 Roosevelt Ave.
Torrington, CT 06790

RE: Applicant: Hugo S. & Regina A. Gerbi
Location: Highland Ave.
Proposal: Special Exception sought to construct new 260' tower
& accessory bldg., R-15 Zone, Sec. 200(L)

TO WHOM IT MAY CONCERN:

Please be advised that said application was heard pursuant to due notice on 5/14/90. The Zoning Board of Appeals unanimously resolved to GRANT said application in accordance with Section 606.B.3 of the Zoning Regulations: (a) will not create or aggravate a traffic or fire hazard, (b) will not block or hamper the town pattern of highway circulation; and (c) will not tend to depreciate the value of property in the neighborhood or be otherwise detrimental to the neighborhood or its residents or alter the neighborhood's essential characteristics.

Staff Reports: Police & Fire City Officials signed-off (approval) on application. Staff Report by Dan McGuinness with no recommendation; requesting additional information (which was presented at meeting). Staff report from Lou Reynolds, Mgr. of Engineering, having no objection with installing new tower, but also requesting additional information.

ZBA members voting in favor of application: W. Stoeckert, J. Marinelli, J. Gregg, A. Benvenuti & R. Blenner.

In order for said Special Exception to become effective, a "Certification" of such must be filed with the City Clerk's Office and recorded. An example of the information that should be included on this "Certification" is enclosed for your convenience.

Sincerely,

A handwritten signature in cursive script that reads "William W. Stoeckert/bp".

William W. Stoeckert,
Chairman

WWS/bp

cc: City Clerk - Original
Applicant
Z.E.O./Letter File
ZBA Chairman
Rec. Sec./App. File

CERTIFICATION OF SPECIAL EXCEPTION

This is to certify that on 5/14/90 the Torrington Zoning Board of Appeals granted a special exception pursuant to Section 200(L) of the Torrington Zoning Regulations and in accordance with Section 606.B.3 of said Regulations authorizing construction of new 260' tower and accessory building on property owned by Hugo and Regina Gerbi. The subject premises are located on Highland Avenue and are more particularly bounded and described as follows:

See Separate Sheet

This certification is filed in accordance with the provisions of Section 8-3d of the Connecticut General Statutes.

Torrington Zoning Board of Appeals

BY *William W. Stoeckert*
William W. Stoeckert, Chairman

Certified on *June 4* 1990

THIS IS A LEGAL INSTRUMENT AND SHOULD BE EXECUTED UNDER SUPERVISION OF AN ATTORNEY

To all People to Whom these Presents shall Come, Greeting:

Know Ye, That I, BERNARD J. ZUCKER, of the Town of Waterbury,
County of New Haven and State of Connecticut,

for the consideration of a valuable sum in dollars

received to my full satisfaction of HUGO S. GERBI AND REGINA A. GERBI,
both of the Town of Torrington, County of Litchfield and State of
Connecticut, presently residing at 183 Roosevelt Avenue, in the
said town of Torrington,

do remise, release, and forever QUIT-CLAIM unto the said HUGO S. GERBI AND REGINA A,
GERBI,

and unto the survivor of them, and unto the heirs and assigns of the survivor of them forever, all the
right, title, interest, claim and demand whatsoever as I the said Releasor

have or ought to have in or to that certain piece or parcel of land, with all
buildings and improvements thereon standing, situated in the Town of
Torrington, County of Litchfield and State of Connecticut, bounded and
described as follows:

Northerly - by land now or formerly of Anthony Grustas;
Easterly - by land now or formerly of James McElhone;
Southerly - by land now or formerly of Anthony Grustas; and
Westerly - by a right of way forty (40) feet in width extending
Northerly from Highland Avenue over land now or formerly
of Anthony Grustas.

Together with a right of way in common with Anthony Grustas over and
across said right of way forty (40) feet in width extending Northerly
from Highland Avenue over land of said Anthony Grustas.

Being the same premises conveyed to the Grantor herein by Quit-Claim
Deed dated May 26, 1964 and recorded in the Torrington Land Records,
Volume 237, Page 553.

CITY OF TORRINGTON ZONING PERMIT FEE \$15.00

No. 2119

Date 2-14-91

Property Owner's Name HUGO & BEATA GERBI Phone No. 203 422-5121

Property Owner's Address 187 RANSFORD AVE. TORRINGTON, CT

Applicant's Name HUGO G. GERBI

Applicant's Address 187 RANSFORD AVE. TORRINGTON, CT

Property's Address 1210 HIGHLAND AVE.

Zone R15 Current Use of Property RADIO COMMUNICATION Map 217 Block 3 Lot 1
Aerial Tax Map

This Permit is issued for the following Activity:

Sign(s) New Construction Change of Use Addition X Interior Alterations

Excavation Other EXISTING

Proposed Use of Property RADIO COMMUNICATION HOUSING

Lot Area 570 AC. Sq. Ft. Area of Exist. Sign Sq. Ft. Area of Proposed sign

Description of Proposed Structure/Sign 2 CAR GARAGE

Dimension of Proposed Structure/Sign: Width 30'-0" Length 24'-0" Height

Setback from Front Line 24'-0" Side Line 20'-0" Rear Line 23'-0"

Required Approvals	Conditions	Effective Date	Expiration Date
<input checked="" type="checkbox"/> L-2 Survey			
<input checked="" type="checkbox"/> Plot Plan	Class "D" Survey attached. (May 1990)		
<input type="checkbox"/> Site Plan or Waiver			
<input checked="" type="checkbox"/> Special Exception or Permit	waived - Z.B.A.	5/14/90	
<input type="checkbox"/> Variance			
<input type="checkbox"/> Subdivision/Resubdivision			
<input type="checkbox"/> Inland Wetlands			
<input type="checkbox"/> Septic/Well Permit			
<input type="checkbox"/> Area Health			
<input type="checkbox"/> State D.O.T.			
<input type="checkbox"/> State Traffic Commission			
<input type="checkbox"/> Grading Permit			
<input type="checkbox"/> Other			

Conditions or Comments: _____

Permit Issued By: John Barkman - C.Z.E.O.

Date: 2/14/91

I, the undersigned applicant, understand that this Zoning Permit is hereby applied for in accordance with the requirements of the Zoning Regulations for the City of Torrington. This permit, is based upon the information submitted by me and that falsification by misrepresentation, omission, or failure to comply with the conditions of approval shall constitute a violation of the Zoning Regulations. I further authorize the Zoning Enforcement officer or his designees to enter my property during and after construction for the purpose of inspection with regards to compliance of this Permit.

Signature of Applicant: [Signature]

Signature of Applicant's Agent _____
(IF OTHER THAN APPLICANT)

Agent's Address & Tel. No. _____

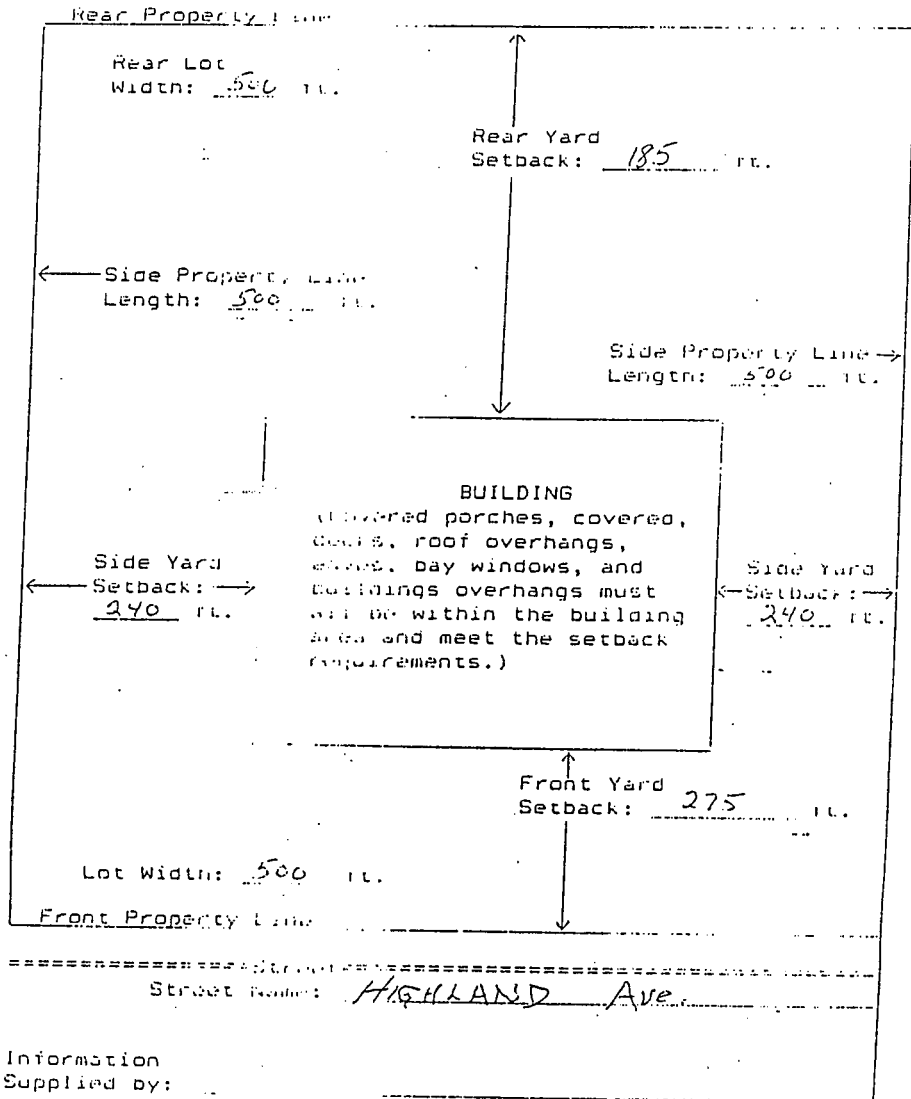
CERTIFICATE OF COMPLIANCE

The activity for which this Certificate of Compliance is issued is in compliance with all the approvals and conditions indicated in the associated Zoning Permit.

PLOT PLAN

Date: 2-14-91
Building Permit No.: _____
Zoning Permit No.: 2119
Land Owner: HUGO REGINA GEREN
Location: E W N S side of Street: NORTH
House Number: _____
Lot Number: 1210
Check One: Interior Lot: ; Corner Lot:

This application shall contain all the information needed to determine if the proposed building, alteration or use complies with the requirements of the zoning regulations. Stakes or markers shall be filed on the lot to indicate the relation of lot lines to the proposed building or structure.



5 ATTACHED MAP

CITY OF TORRINGTON
140 MAIN ST. - ROOM 314
TEL. (203) 489-2245

BUILDING PERMIT

DEPT. FILE COPY

AMOUNT PAID

Cash #255.-
VALIDATION

APPLICANT Hugo & Regina Gerbi DATE March 15, 19 91 PERMIT NO. 12726
ADDRESS 183 Roosevelt Ave., Torrington, CT
(NO.) (STREET) (CONTR'S LICENSE)

PERMIT TO Radio Tower & Housing NO. 1 STORY Radio Communication NUMBER OF DWELLING UNITS _____
(TYPE OF IMPROVEMENT) (PROPOSED USE)

AT (LOCATION) 1210 Highland Ave. Z.P. 2119 2/14/91 ZONING DISTRICT R-15
(NO.) (STREET)

BETWEEN _____ AND _____
(CROSS STREET) (CROSS STREET)

SUBDIVISION Assessor's Map 214 LOT 13 BLOCK 3 LOT SIZE 5.70 ac.

BUILDING IS TO BE 30 FT. WIDE BY 24 FT. LONG BY _____ FT. IN HEIGHT AND SHALL CONFORM IN CONSTRUCTION

TO TYPE _____ USE GROUP _____ BASEMENT WALLS OR FOUNDATION _____ (TYPE)

REMARKS: "AS PER DRAWING. " "STORAGE"

AREA OR VOLUME _____ (CUBIC/SQUARE FEET) ESTIMATED COST \$ 49,000. PERMIT FEE \$ 255.

OWNER Hugo & Regina Gerbi Hugo Gerbi
ADDRESS 183 Roosevelt Ave., Torrington, CT 06790 BUILDING DEPT BY Francis Condit

(Affidavit on reverse side of application to be completed by authorized agent of owner)

FORM NO. BOCA-BP 1969



U.S. Department
of Transportation
**Federal Aviation
Administration**

IN REPLY REFER TO
AERONAUTICAL STUDY
NO. 90-ANE-137-OE

ACKNOWLEDGMENT OF NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION

SPONSOR	Hugo and Regina Gerbi 183 Roosevelt Avenue Torrington, CT 06790		CONSTRUCTION LOCATION	
			PLACE NAME Torrington, CT	
			LATITUDE 41°48'05"	LONGITUDE 73°09'51"
CONSTRUCTION PROPOSED	DESCRIPTION Antenna/Tower	HEIGHT (IN FEET)		
		ABOVE GROUND 260	ABOVE MSL 1,480	

The Federal Aviation Administration hereby acknowledges receipt of notice dated April 11, 1990 concerning the proposed construction or alteration described above.

A study has been conducted under the provisions of Part 77 of the Federal Aviation Regulations to determine whether the proposed construction would be an obstruction to air navigation, whether it should be marked and lighted to enhance safety in air navigation, and whether supplemental notice of start and completion of construction is required to permit timely charting and notification to airmen. The findings of that study are as follows:

- The proposed construction does not require a notice to FAA.
- The proposed construction is not identified as an obstruction under any standard of FAR, Part 77, Subpart C and would not be a hazard to air navigation.
- The proposed construction is identified as an obstruction under the standards of FAR, Part 77, Subpart C but would not be a hazard to air navigation.
- The structure should be obstruction marked and lighted per FAA Advisory Circular AC 70/7460-1, "Obstruction Marking and Lighting." Chapters 3, 4, 5 & 9
- Supplemental notice is required at least 48 hours before the start of construction and within five days after construction reaches its greatest height (use the enclosed FAA form).

This determination expires on Dec. 27, 1990 unless:

- (a) extended, revised or terminated by the issuing office;
- (b) the construction is subject to the licensing authority of the Federal Communications Commission and an application for a construction permit is made to the FCC on or before the above expiration date. In such case the determination expires on the date prescribed by the FCC for completion of construction, or on the date the FCC denies the application.

NOTE: Any request for extension of the effective period of this determination must be postmarked or delivered to the issuing office at least 15 days prior to the expiration date.

- The proposed construction would exceed Part 77 obstruction standards and further aeronautical study is necessary to determine whether it would be a hazard to air navigation. Pending completion of any further study, it is presumed the construction would be a hazard to air navigation. Further study:
 - Has been initiated by the FAA.
 - May be requested by the sponsor within 30 days of date of this acknowledgement.
- If the proposed structure were reduced in height to not exceed _____ ft. above ground level (_____ ft. above sea level), it would not exceed Part 77 obstruction standards.

If the structure is subject to the licensing authority of the FCC, a copy of this acknowledgment will be sent to that Agency.

NOTICE IS REQUIRED ANYTIME THE PROJECT IS ABANDONED OR THE PROPOSAL IS MODIFIED.

See second page.

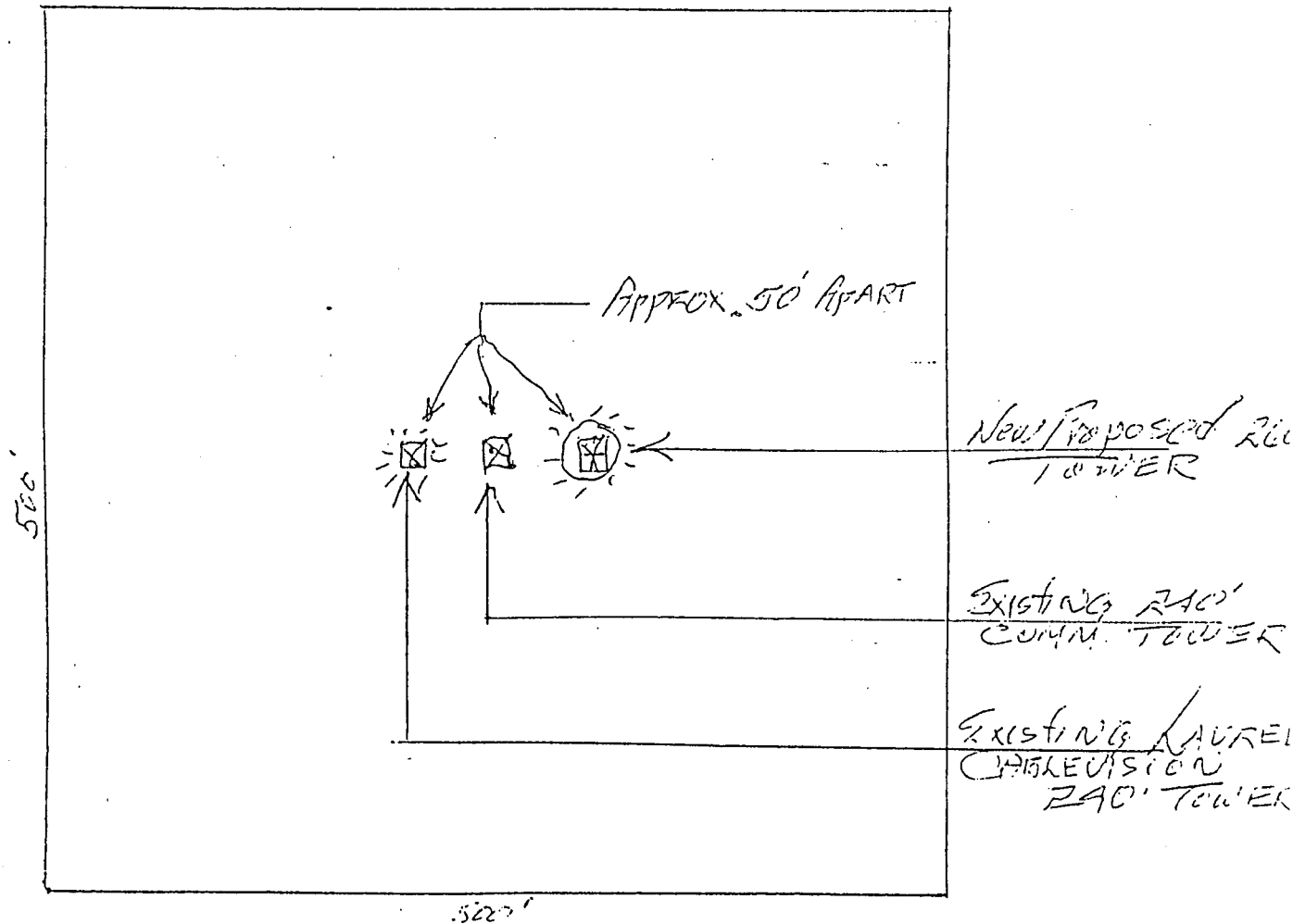
SIGNED Barbara L. Federici TITLE Airspace Specialist
ISSUED IN Burlington, MA ON May 18, 1990

The FAA concurs with your request to remove the lighting on the communications tower upon the completion and lighting of the proposed 260 foot tower, however final approval for any modification of lighting on an FCC regulated structure must be co-ordinated with the FCC.

A copy of this FAA Form 7460-7 will be forwarded to the FCC.

FAA 4/14/90

THE TWO EXISTING TOWERS HAVE FAA APPROVED LIGHTING. I AM REQUESTING FROM FAA APPROVAL TO REMOVE THE COMM. TOWER LIGHTING UPON COMPLETION OF THE NEW 260' TOWER. LAUREL AND THE NEW TOWER WILL THEN BE ILLUMINATED (COMM TOWER TO REMAIN WITHOUT LIGHTING)



1" = 100'

Hugo J. Lark
5 Highland Ave.
Tarrington Ct.
06790

SUPPLEMENTAL NOTICE

PROPONENT'S COPY

Aeronautical Study No.
90-ANE-137-0E



NOTICE OF ACTUAL CONSTRUCTION OR ALTERATION

1. CONSTRUCTION

Type and Description of Construction

ERECT ANTENNA TOWER FOR COMMUNICATION

2. CONSTRUCTION LOCATION - HEIGHT

A. Coordinates (To tenths of seconds, if known)		B. Location (Distance and direction from nearest city or town. Include street address if any.)	
Latitude	Longitude	1210 HIGHLAND AVE. TORRINGTON, CT. 06790 2 MI. WEST OF TORRINGTON CT.	
41 48 05 " N	73 09 51 " W		
C. Construction Height		E. Name of Nearest Public-Use Airport - include Distance and Direction	
Above Ground Level	Total Height (Construction & Site) Above Mean Sea Level	JUNCAKE AIRPORT MI. EAST	
AGL 60 Ft.	AMS L 1480 Ft.		
D. Site Elevation Determined By			
<input type="checkbox"/> Actual Survey <input type="checkbox"/> Map Contour <input type="checkbox"/> Other			

3. CONSTRUCTION NOTIFICATIONS

A. Notification (Notice is Critical to flight Safety—FAR Part 77 Required ★)	Date	B. Construction/Project	Date
★ (1) Construction will start (Submit at least 48 hrs. in advance)	7-10-90	NOT HAZARD TO AIR NAVIGATION	
(2) Estimated Completion	7-12-90	(1) Project Abandoned	
★ (3) Structure Reached Greatest Height (Submit within 5 days)	7-11-90	(2) Construction Dismantled	

4. MARKING AND LIGHTING

A. Marked	B. Lighted
<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Temporary	<input type="checkbox"/> High Intensity White <input type="checkbox"/> Red <input type="checkbox"/> Temporary <input type="checkbox"/> Dual (High Intensity White and Red) <input type="checkbox"/> None

5. ANTENNA REQUIRING FCC LICENSE

A. Call Sign	B. Frequency	C. Date Applied for FCC Construction Permit	D. Date Construction Permit Issued

6. PREPARER'S CERTIFICATION

SUBMITTED BY: (If submitted by a proponent's representative, please also complete item B.)	A. Proponent's Representative	B. Construction Proponent	
	Name: <u>1100 HIGHLAND GARDEN</u>	Name:	
	Address: <u>12 TORRINGTON AVE. TORRINGTON, CT. 06790</u>	Address:	
	Tel. No.: <u>(203) 257-2571</u> (Include Area Code)	Tel. No.:	(Include Area Code)
I CERTIFY INFORMATION PROVIDED IS TRUE, COMPLETE, AND CORRECT TO THE BEST OF MY KNOWLEDGE			
Signature	Title	Date	
<u>[Signature]</u>	<u>Rep.</u>	7-11-90	

NOTICE is required by Part 77 of the Federal Aviation Regulations (14 C.F.R. Part 77) pursuant to Section 1101 of the Federal Aviation Act of 1958, as amended (49 U.S.C. 1101). Persons who knowingly and willfully violate the notice requirements of Part 77 are subject to a fine (criminal penalty) of not more than \$500 for the first offense and not more than \$2,000 for subsequent offenses, pursuant to Section 902(A) of the Federal Aviation Act of 1958, as amended (49 U.S.C. 1472(A)).

APPENDIX D. Proposed Site Development Plan for 1210 Highland Avenue, Torrington, CT; prepared by Land-Tech Consultants, Inc., 205 Playhouse Corner, Southbury, CT 06488 (prepared by Michael J. Bartos, Jr., P.E.; 3/6/91; revised 4/24/91).

APPENDIX E.

Municipal zoning and building approvals and permits obtained by LCC for activities proposed in this Notice:

- (1) Memo from Dan McGuinness, Torrington City Planner, Recommendation to Planning and Zoning Commission to grant Special Exception (dated 3/12/91);
- (2) City of Torrington Planning and Zoning Commission "Zoning Board of Appeals - Special Exception Referral," recommendation of approval of Special Exception to ZBA (copy of 3/13/91 minutes attached);
- (3) City of Torrington ZBA Special Exception (Section 200 Special Exception, Subsection L and Section 606B.3) to place antennas on the existing tower and construct an accessory telecommunications building in R-40 zone (certified 6/3/91) (also attached is a copy of the Special Exception recorded with the Torrington Land Records);
- (4) City of Torrington Zoning Permit No. 2232 (dated 6/7/91);
- (5) City of Torrington Building Permit No. 12874 (dated 6/7/91) to construct 12' x 20' equipment building.

To: Planning and Zoning Commission

From: Dan McGuinness DEM

Date: 3/12/91

Re: Special Exception for Radio Transmission Tower

Location: North side of Highland Avenue just east of
Westside Road

Applicant: Litchfield County Cellular, Inc.

Lot Size: 5.7 acres

Zone: R-40

Comments:

1. Applicant received a special exception for a tower on May 22, 1972. On May 14, 1990 the applicant received a second special exception to construct another tower and associated building.

2. Property currently contains four towers and four other buildings. Applicant is proposing to add an antenna to an existing tower and construct a 200 square foot equipment building.

3. After the property owner obtained the special exception in 1990, he constructed an addition to a building and the tower prior to obtaining a zoning permit or a building permit. He has since obtained both.

4. The property owner should verify that the existing buildings are being used only for equipment needed to operate the communications equipment on the towers or to maintain the property.

Recommendation:

I recommend that the Planning and Zoning Commission recommend to the ZBA the approval of the additional antenna and associated building with the condition that all buildings on the property be used only for the equipment needed to operate the communications equipment on the towers or to maintain the property.

cc: ZBA

Rewriting of Zoning Regulations for City

MOTION by Mr. Frascarelli to hold a Special Meeting on 3/20/91 at 7 p.m.
SECOND by Ms. Pacheco, unanimously moved.

6. Zoning Board of Appeals - Special Exception Referrals.

Applicant: Litchfield County Cellular
Location: 1210 Highland Ave.
Proposal: Special Exception to Sec. 200 L and 606 in order to build a single story building and place a new antenna on an existing tower for the transmission of radio (telephone) signals.

Robert Jontos, a consultant for Land-Tech explained that the antenna will be on an existing tower and will be no more than 250 ft. high; a building will be constructed; the existing two car garage will be used for radio rooms according to Mr. Gerbi, the owner.

3/12/91 Staff Report by City Planner recommended approval of the additional antenna and associated building with the condition that all buildings on the property be used only for the equipment needed to operate the communications equipment on the towers or to maintain the property.

MOTION by Mr. Frascarelli to recommend approval to Z.B.A. as per the City Planner's recommendation of 3/12/91.

SECOND by Mrs. Murphy, unanimously moved.

7. New Business:

a. Ct. Federation of P&Z Agencies- Annual Meeting 3/21/91 at Yankee Silversmith Inn, Wallingford reservations due by 3/19/91 \$23.00 per person. Dinner 6 p.m. - Awards 7:15 p.m. Affordable Housing 8 p.m.

b. Applicant: Michael Rossi
Location: 327 Goshen Rd.
Proposal: Zone change from R-15 Residential to L.B. Local Business

MOTION by Mr. Frascarelli to set a public hearing date of 4/10/91 at 7:30 p.m.

SECOND by Ms. Pacheco, unanimously moved.

c. Memo to Mayor Donne from City Planner-Dan McGuinness regarding proposed fees for site plan applications and grading permits.

MOTION by Ms. Pacheco to table.

SECOND by Mr. Frascarelli, unanimously moved.

ZONING BOARD OF APPEALS

TORRINGTON, CT 06790

SPECIAL EXCEPTION AND/OR VARIANCE CERTIFICATION

Applicant Name: Litchfield County Cellular

Description of Premises Involved:

a) Street Address: 1210 Highland Avenue

B) Attach Copy of Deed

Nature of Variance and/or Special Exception: Special Exception to place an antenna
on the existing tower, and construct an accessory telecommunications
building in R-40 zone.

Owner of Record: Hugo and Regina Gerbi, 183 Roosevelt Ave., Torrington

Condition(s) of Approval: All buildings on the property will be used only for
equipment needed to operate the communications equipment on the tower or
to maintain the property.

Date of Granting of Such Variance and/or Special Exception: 4/8/91

Section(s) of the Torrington Zoning Regulations which has been varied in its appli-
cation or to which a special exception is granted: Section 200 Special Exceptions,
Subsection L and Section 606B.3

This certification is filed in accordance with the provisions of Section 8-3d of the Connecticut General Statutes.

By 
William W. Stoeckert, Z.B.A. Chairman

Certified on June 3, 1991.

THIS IS A LEGAL INSTRUMENT AND SHOULD BE EXECUTED UNDER SUPERVISION OF AN ATTORNEY

To all People to Whom these Presents shall Come, Greeting:

Know Et, That I, BERNARD J. ZUCKER, of the Town of Waterbury,
County of New Haven and State of Connecticut,

for the consideration of a valuable sum in dollars

received to my full satisfaction of HUGO S. GERBI AND REGINA A. GERBI,
both of the Town of Torrington, County of Litchfield and State of
Connecticut, presently residing at 183 Roosevelt Avenue, in the
said town of Torrington,

do remise, release, and forever QUIT-CLAIM unto the said HUGO S. GERBI AND REGINA A,
GERBI,

and unto the survivor of them, and unto the heirs and assigns of the survivor of them forever, all the
right, title, interest, claim and demand whatsoever as I the said Releasor
have or ought to have in or to

that certain piece or parcel of land, with all
buildings and improvements thereon standing, situated in the Town of
Torrington, County of Litchfield and State of Connecticut, bounded and
described as follows:

Northerly - by land now or formerly of Anthony Grustas;
Easterly - by land now or formerly of James McElhone;
Southerly - by land now or formerly of Anthony Grustas; and
Westerly - by a right of way forty (40) feet in width extending
Northerly from Highland Avenue over land now or formerly
of Anthony Grustas.

Together with a right of way in common with Anthony Grustas over and
across said right of way forty (40) feet in width extending Northerly
from Highland Avenue over land of said Anthony Grustas.

Being the same premises conveyed to the Grantor herein by Quit-Claim
Deed dated May 26, 1964 and recorded in the Torrington Land Records,
Volume 237, Page 553.

049092

ZONING BOARD OF APPEALS

TORRINGTON, CT 06790

SPECIAL EXCEPTION AND/OR VARIANCE CERTIFICATION

Applicant Name: Litchfield County Cellular

Description of Premises Involved:

a) Street Address: 1210 Highland Avenue

B) Attach Copy of Deed

Nature of Variance and/or Special Exception: Special Exception to place an antenna on the existing tower, and construct an accessory telecommunications building in R-40 zone.


Owner of Record: Hugo and Regina Gerbi, 183 Roosevelt Ave., Torrington

Condition(s) of Approval: All buildings on the property will be used only for equipment needed to operate the communications equipment on the tower or to maintain the property.

/91

ied in its appli-
ecial Exceptions,

section 8-3d of the


Z.B.A. Chairman

State of Connecticut, }
County of Litchfield, } ss.

**Torrington
Office of Town Clerk**

I, Addo E. Bonetti, Town Clerk of said Torrington, duly elected and qualified according to law and having custody of the seal of said Town of Torrington, hereby certify that the annexed instrument is a true copy from the records of said Town, and that the original instrument from which said copy is taken is recorded on page of Volume 524 of Torrington Land Records

In Testimony Whereof I have hereunto set my hand and affixed the seal of said Town of Torrington this 7th day of June A.D. 19 91

 Town Clerk.

CITY OF TORRINGTON ZONING PERMIT FEE \$15.00

No. 2232

Date 6.7.91

Property Owner's Name MURIO & REGINA GERBI

Phone No. 489-9999

Property Owner's Address 183 ROOSEVELT AVE.

TORRINGTON

Applicant's Name LITCHFIELD COUNTY CELLULAR, INC

Applicant's Address 777 E. MAIN ST TORRINGTON

Property's Address 1210 HIGHLAND AVE. TORRINGTON

Zone B-40 Current Use of Property TELECOMMUNICATIONS BLDGS & TOWERS Map 317 Block 3 Lot 13
Aerial Tax Map

This Permit is issued for the following Activity:

Sign(s) New Construction X Change of Use Addition Interior Alterations

Excavation Other

Proposed Use of Property SAME AS EXISTING

Lot Area 250,028 Sq. Ft. Area of Exist. Sign N/A Sq. Ft. Area of Proposed sign NONE

Description of Proposed Structure/Sign NONE

Dimension of Proposed Structure/Sign: Width NONE Length NONE Height NONE

Setback from Front Line 275' ± Side Line 200' / 20' ± Rear Line 205' ±

Required Approvals	Conditions	Effective Date	Expiration Date
<input checked="" type="checkbox"/> A-2 Survey			
<input checked="" type="checkbox"/> Plat Plan	<u>see attached plan</u>		
<input type="checkbox"/> Site Plan or Waiver			
<input checked="" type="checkbox"/> Special Exception or Permit	<u>approved 7/8/91</u>		
<input type="checkbox"/> Variance			
<input type="checkbox"/> Subdivision/Resubdivision			
<input type="checkbox"/> Inland Wetlands			
<input type="checkbox"/> Septic/Well Permit			
<input type="checkbox"/> Area Health			
<input type="checkbox"/> State D.O.T.			
<input type="checkbox"/> State Traffic Commission			
<input type="checkbox"/> Grading Permit			
<input type="checkbox"/> Other			

Conditions or Comments: Construction of ~~footings~~ 12' x 20' equipment building

Permit Issued By: DR. MZ.

Date: 6/7/91

I, the undersigned applicant, understand that this Zoning Permit is hereby applied for in accordance with the requirements of the Zoning Regulations for the City of Torrington. This permit, is based upon the information submitted by me and that falsification by misrepresentation, omission, or failure to comply with the conditions of approval shall constitute a violation of the Zoning Regulations. I further authorize the Zoning Enforcement officer or his designees to enter my property during and after construction for the purpose of inspection with regards to compliance of this Permit.

Signature of Applicant: _____

Signature of Applicant's Agent Richard J. Barstow % Land-Teck Council

Agent's Address & Tel. No. 305 Bayshore Center Southbury CT 06488
267-8300

CERTIFICATE OF COMPLIANCE

The activity for which this Certificate of Compliance is issued is in compliance with all the approvals and conditions indicated in the associated Zoning Permit.

Certificate Issued By: _____

Date: _____

CITY OF TORRINGTON
 140 MAIN ST. - ROOM 314
 TEL. (203) 489-2245

BUILDING PERMIT

JOB WEATHER CARD

APPLICANT Litchfield County Cellular, Inc. DATE June 7, 91 PERMIT NO. 12874
 ADDRESS 777 East Main St., Torrington 06790 (NO.) (STREET) (CONTR'S LICENSE)

PERMIT TO _____ (TYPE OF IMPROVEMENT) (NO.) STORY _____ TELECOMMUNICATIONS BUILDING NUMBER OF DWELLING UNITS _____
 (PROPOSED USE)

AT (LOCATION) 1210 Highland Ave., L.F. ZONING DISTRICT R-40
 (NO.) (STREET)
 BETWEEN Westside Lane AND Baron Lane
 (CROSS STREET) (CROSS STREET)

SUBDIVISION Assessor's Map 214 LOT 13 BLOCK 3 LOT SIZE _____

BUILDING IS TO BE 12 FT. WIDE BY 20 FT. LONG BY 10'2" FT. IN HEIGHT AND SHALL CONFORM IN CONSTRUCTION

TO TYPE _____ USE GROUP _____ BASEMENT WALLS OR FOUNDATION Concrete (TYPE)

REMARKS: _____

AREA OR VOLUME _____ (CUBIC/SQUARE FEET) ESTIMATED COST \$ 40,000. PERMIT FEE \$ 210.

OWNER Litchfield County Cellular, Inc.
 ADDRESS 777 East Main St., Torrington, CT 06790 BUILDING DEPT. BY _____

THIS PERMIT CONVEYS NO RIGHT TO OCCUPY ANY STREET, ALLEY OR SIDEWALK OR ANY PART THEREOF, EITHER TEMPORARILY OR PERMANENTLY. ENCROACHMENTS ON PUBLIC PROPERTY, NOT SPECIFICALLY PERMITTED UNDER THE BUILDING CODE, MUST BE APPROVED BY THE JURISDICTION. STREET OR ALLEY GRADES AS WELL AS DEPTH AND LOCATION OF PUBLIC SEWERS MAY BE OBTAINED FROM THE DEPARTMENT OF PUBLIC WORKS. THE ISSUANCE OF THIS PERMIT DOES NOT RELEASE THE APPLICANT FROM THE CONDITIONS OF ANY APPLICABLE SUBDIVISION RESTRICTIONS.

MINIMUM OF THREE CALL INSPECTIONS REQUIRED FOR ALL CONSTRUCTION WORK:
 1. FOUNDATIONS OR FOOTINGS.
 2. PRIOR TO COVERING STRUCTURAL MEMBERS (READY TO LATH).
 3. FINAL INSPECTION BEFORE OCCUPANCY.

APPROVED PLANS MUST BE RETAINED ON JOB AND THIS CARD KEPT POSTED UNTIL FINAL INSPECTION HAS BEEN MADE. WHERE A CERTIFICATE OF OCCUPANCY IS REQUIRED, SUCH BUILDING SHALL NOT BE OCCUPIED UNTIL FINAL INSPECTION HAS BEEN MADE.

WHERE APPLICABLE SEPARATE PERMITS ARE REQUIRED FOR ELECTRICAL, PLUMBING AND MECHANICAL INSTALLATIONS.

POST THIS CARD SO IT IS VISIBLE FROM STREET

BUILDING INSPECTION APPROVALS	PLUMBING INSPECTION APPROVALS	ELECTRICAL INSPECTION APPROVALS
1	1	1
2	2	2
3	HEATING INSPECTING APPROVALS 1	REFRIGERATION INSPECTION APPROVALS 1
OTHER	2	2

WORK SHALL NOT PROCEED UNTIL THE INSPECTOR HAS APPROVED THE VARIOUS STAGES OF CONSTRUCTION.

PERMIT WILL BECOME NULL AND VOID IF CONSTRUCTION WORK IS NOT STARTED WITHIN SIX MONTHS OF DATE THE PERMIT IS ISSUED AS NOTED ABOVE.

INSPECTIONS INDICATED ON THIS CARD CAN BE ARRANGED FOR BY TELEPHONE OR WRITTEN NOTIFICATION.

FORM NO. BOCA - BP 1989

APPENDIX F. Analysis and model of radiofrequency radiation power densities; prepared on 5/8/91 by Brent R. Shirey, Consulting Engineer, Gurman, Kurtis, Blask & Freedman, Suite 500, 1400 16th St., N.W., Washington, D.C. 20036 (202/328-8200). Also attached is FCC Report No. DC-838.

1. Assumptions

The following list identifies the major assumptions that were made to complete the analysis on predicted RF electromagnetic power density levels within the property of interest. The calculations used in conjunction with these assumptions produce results that are truly worst case.

- In the event that the actual operating power of a service was not known or was not available, the maximum power allowed by the FCC was assumed.
- While the antennas are actually mounted above ground level, the distance from the base of each respective tower to the nearest point on each property boundary was used in the calculations.
- 100% ground reflectivity was assumed.
- It was assumed that the ground was level.
- It was assumed that the maximum lobe of radiation for each antenna was directed toward the property boundary of interest (In all cases actual signal strengths will be below those levels used in the calculations).

2. Standards

The standards which have been adopted by the Connecticut State DEP with respect to RF electromagnetic radiation are those which were compiled by ANSI. The radio frequency protection guides, tabulated below, are weighted according to the effects each frequency range have on human health.

Table B2.1. Radio Frequency Protection Guides Adopted by ANSI

<u>Frequency Range (MHz)</u>	<u>Power Density (mW/cm²)</u>
0.3 - 3	100
3 - 30	900/f ²
30 - 300	1.0
300 - 1500	f/300
1500 - 100,000	5.0

where: f = frequency in megahertz (MHz)

mW/cm² = milliwatts per square centimeter

Note: The ANSI standards state, "For mixed or broadband fields at a number of frequencies for which there are different values of protection guides, the fraction of the radio frequency protection guide incurred within each frequency interval should be determined, and the sum of all such fractions should not exceed unity."

3. Calculations

OST Bulletin No. 65 provides step-by-step instructions for calculating electromagnetic power density levels at a certain distance from an antenna. The formula used to predict radiation levels around "typical RF sources" is:

$$S = \text{ERPi} / \pi R^2 \quad [\text{mW/cm}^2] \quad (1)$$

where: S = power density
 ERPi = effective isotropic radiated power
 R = distance to the antenna's center of radiation

This equation provides a "truly worst-case approximation" because it assumes a ground reflection efficiency of 100%.

The existing antennas at the Gerbi property and the cellular antennas proposed by LCC can be considered "typical RF sources" in which case equation 1 can be used effectively. However, LCC also intends to use microwave facilities to connect this proposed base station with the base station of a neighboring cell. Antennas used to perform this task are called aperture antennas.

OST Bulletin No. 65 states that the highly directional nature of aperture antennas is such that the "possibility of significant human exposure to RF radiation is considerably reduced." For purposes of evaluating exposure to RF radiation originating from microwave antennas, the following equation can be used,

$$S = \text{PG} / 4\pi R^2 \quad [\text{mW/cm}^2] \quad (2)$$

where: S = power density (on axis)
 P = power fed to the antenna
 G = gain of the antenna relative to isotropic
 R = distance to the point of interest

Please note that Equation 2 provides information about the on-axis power densities. In actuality, it is very unlikely that an individual would be exposed to the maximum power density magnitudes obtained with Equation 2 because the highly directive antennas are mounted well above ground. Nonetheless, this formula has been used to provide worst-case results of LCC's proposed microwave facility.

3. Calculations (continued)

As can be observed from Equations 1 and 2, the power density calculated at a specific distance from an antenna is inversely proportional to the square of the distance. For this reason, the separation between the base of each respective tower and the nearest point on each property boundary has been used in the calculations to obtain the worst case results.

Table B3.1 lists the distances, in centimeters, between each tower and the property boundaries. Refer to Figure B3.1 which illustrates the positioning of the towers, labeled A through D, with respect to the property boundaries, labeled 1 through 4.

Table B3.1

	Tower A	Tower B	Tower C	Tower D
Boundary 1	6462	7530	8780	13870
Boundary 2	6860	7530	7986	13320
Boundary 3	8687	7560	6310	1210
Boundary 4	8230	7500	7010	1676

Using these values for R in equations 1 or 2, one can calculate the worst-case power density level at each boundary produced by the numerous services operating at the Gerbi property.

Upon calculating the power density generated by an individual service, one can find the fractional contribution ("FC") which that facility makes toward the cumulative power density level. Equation 3 shows the relationship between each service's FC, the ANSI Radio Frequency Protection Guides ("RFPG") for the frequency of interest, and the service's power density ("S") which is calculated with Equation 1 or 2.

$$FC = S / RFPG \quad [\text{dimensionless}] \quad (3)$$

The percentage contribution ("PC") can be found simply by multiplying the FC by 100, as depicted in Equation 4.

$$PC = FC \times 100 \quad [\%] \quad (4)$$

As dictated by the ANSI Standards, the sum of all FC's cannot exceed unity and still be deemed safe. Likewise, the sum of all PC's cannot exceed 100% and still remain within the ANSI protection guidelines.

S 76°42'18"E 500.10'

SPRUCE HEDGE

BOUNDARY 1

Figure B3.1

250030 s1 +/-
5.74 Ac +/-

PROPOSED BUILDING







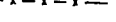
EXISTING BUILDING

MARVAIR ECONOMIZERS

TOWER B

TOWER A

LEGEND:

-  stone wall
-  existing tower
-  property line
-  iron pipe or pin
-  guy anchor
-  guy wire
-  fence



TOWER C

LEASE AREA

TOWER D

EX BLDG

300.28'

BOUNDARY 3

0.18'

SPRUCE HEDGE

39.73'

N 76°42'18"W 500.01'

N-F HANNA GRUSTAS

N-F NORMAN WAYNE SHOLTIS

BOUNDARY 4

BOUNDARY 2

S 13°15'37"W 500.00'

4. Results

Table B4.1 lists the services operating from the Gerbi property on a per tower basis. The transmitting frequency and effective isotropic radiated power of each service are also tabulated. In addition, the ratio of the power density calculated at each property boundary versus that allowed by the ANSI Standards for that particular transmitting frequency is listed.

One will recall from the ANSI Standards that, "For mixed or broadband fields at a number of frequencies for which there are different values of protection guides, the fraction of the radio frequency protection guide incurred within each frequency interval should be determined, and the sum of all such fractions should not exceed unity." Accordingly, the summation of the fractions in the final columns of Table B4.1 (Boundaries 1 through 4) shows that the radio frequency protection guide adopted by the Connecticut State Department of Environmental Protection is not exceeded at any of the four property boundaries.

With the values of Table B4.1, the percentage increase in total electromagnetic power density attributed to LCC's implementation of their cellular and microwave facilities can be calculated. These increases are 2.3%, 2.2%, 0.7%, and 0.9% for boundaries 1 through 4, respectively.

To reiterate, the services proposed by LCC produce cumulative power density levels that remain within the standards adopted by the DEP. Furthermore, the power densities at each property boundary fully comply with these standards.

Table B4.1

<u>Service</u>	<u>Transmitting Freq. (MHz)</u>	<u>Maximum ERP_i (W)</u>	<u>Fraction of ANSI Protection Guide ("FC") As Calculated at Boundaries</u>			
			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Tower A						
LCC-Cellular	870	2,624	0.0069	0.0061	0.0038	0.0043
LCC-Microwave	2,100	10,376	0.0040	0.0035	0.0022	0.0024
FM Broadcast Station	97.3	19,680	0.1500	0.1332	0.0830	0.0925
T.V. Lab & Comm.	463.275	820	0.0041	0.0036	0.0022	0.0025
Page America	931.6125	1,640	0.0040	0.0036	0.0022	0.0025
Tower B						
Pioneer Valley	146.250	24,600	0.1382	0.1382	0.1370	0.1393
Motorola	463.675	820	0.0030	0.0030	0.0030	0.0030
	855	9,840	0.0194	0.0194	0.0192	0.0195
New Valley Comm.	461.525	1,640	0.0060	0.0060	0.0059	0.0060
Pioneer Comm.	461.600	1,640	0.0060	0.0060	0.0059	0.0060
Campion Ambulance	461.225	5,740	0.0210	0.0210	0.0208	0.0211
Message Center	158.700	2,296	0.0129	0.0129	0.0128	0.0130
Mobile Co.	152.240	2,296	0.0129	0.0129	0.0128	0.0130
	152.480	1,640	0.0092	0.0092	0.0091	0.0093
	35.600	984	0.0055	0.0055	0.0055	0.0056
Metro Media	454.175	5,740	0.0213	0.0213	0.0211	0.0215
T.M. Bldg. Co.	35.320	5,740	0.0322	0.0322	0.0320	0.0325
IBM	855.0125	820	0.0016	0.0016	0.0016	0.0016
Federal Express	860.8625	820	0.0016	0.0016	0.0016	0.0016

Table B4.1 (continued)

<u>Service</u>	<u>Transmitting Freq. (MHz)</u>	<u>Maximum ERP_i (W)</u>	<u>Fraction of ANSI Protection Guide ("FC") As Calculated at Boundaries</u>			
			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Tower B						
City of Torrington	856.7375	1,640	0.0032	0.0032	0.0032	0.0033
Pagenet	931.2875	1,640	0.0030	0.0030	0.0029	0.0030
Contact Comm.	931.2125	1,640	0.0030	0.0030	0.0029	0.0030
Tower C						
Arch CT Valley, Inc.	454.450	5,740	0.0157	0.0189	0.0303	0.0245
Tower D						
Torrington Street Dept.	155.100	164	0.0003	0.0003	0.0358	0.0186
Torrington Civil Defense	147.840	33	0.0001	0.0001	0.0072	0.0037
Iffland Lumber Co.	152.975	492	0.0008	0.0009	0.1073	0.0557
Ryder Transportation	155	620	0.0010	0.0011	0.1345	0.0698
Marcus Comm.	464.500	820	0.0009	0.0010	0.1155	0.0600
Mobile Comm.	931.8125	1,640	<u>0.0009</u>	<u>0.0010</u>	<u>0.1151</u>	<u>0.0598</u>
Total of FC's:			0.4887	0.4733	0.9364	0.6986
Total of PC's:			48.87%	47.33%	93.64%	69.86%



NEWS

FEDERAL COMMUNICATIONS COMMISSION
 1919 M STREET, N.W.
 WASHINGTON, D.C. 20554

1919

This is an unofficial announcement of Commission action. Release of the full text of a Commission order constitutes official action. See MCI v. FCC, 515 F.2d 385 (D.C. Cir. 1975)

Report No. DC-838

ACTION IN DOCKET CASE

February 12, 1987

CERTAIN FCC-REGULATED SERVICES EXCLUDED FROM RF RADIATION EVALUATION;
 RF RADIATION EVALUATION OF SHIP EARTH AND RADAR STATIONS PROPOSED
 (GEN. DOCKET 79-144)

The Commission has categorically excluded certain FCC-regulated facilities and services from radiofrequency (RF) radiation evaluation.

It also proposed amending Part 80 of the rules to provide protection for humans from potentially hazardous RF radiation generated by ship earth and radar stations.

The Commission noted that the vast majority of FCC-regulated services would be excluded from routine RF radiation evaluation because individually or cumulatively they do not have a significant effect on the "quality of the human environment." The American National Standards Institute RF safety guidelines are used to measure excessive RF radiation exposure to humans. Proposed facilities and services not excluded from RF radiation evaluation include: experimental broadcast stations (Part 5), satellite communications facilities (Part 25), radio and television broadcast stations (Part 73), experimental and developmental broadcast stations (Part 74, Subpart A), and low power television stations (Part 74, Subpart G).

The FCC pointed out there was no evidence of excessive RF radiation exposure during routine and normal operation of land-mobile and fixed communications services, including cellular radio, microwave point-to-point radio, and most auxiliary broadcast services.

Therefore, applications for facilities licensed under Parts 21, 22, 23, 90, 94, and other appropriate Parts of the rules are not required to routinely submit environmental information concerning exposure to RF radiation.

In implementing the National Environmental Policy Act regarding potentially hazardous RF radiation from FCC-regulated services, the FCC proposed two amendments to Part 80 for ship earth and marine radar stations. The first would require that ship earth and marine radar stations be properly installed and safely operated by complying with the RF safety guidelines. The second would require that manufacturers of transmitters for ship earth and marine radar stations provide each unit with RF exposure guidelines for installation and operation. It noted the proposed amendments would be administratively more feasible than requiring separate environmental analysis of every application for a ship earth or radar station.

(over)

-2-

Comments are requested on the proposed amendments.

Action by the Commission February 12, 1987, by Second Report and Order (FCC 87-63) and Third Notice of Proposed Rulemaking (FCC 87-64). Commissioners Fowler (Chairman), Quello, Dawson, Patrick and Dennis.

-FCC-

News Media contact: Audrey Spivack at (202) 632-5050.

Office of Engineering and Technology contact: Robert Cleveland at (202) 653-8169.

Before the
Federal Communications Commission
Washington, D.C. 20554

GEN. Docket No. 79-144

In the Matter of

Responsibility of the Federal Communications Commission to consider biological effects of radiofrequency radiation when authorizing the use of radiofrequency devices.

Potential effects of a reduction in the allowable level of radiofrequency radiation on FCC authorized communications services and equipment.

SECOND REPORT AND ORDER

Adopted: February 12, 1987;

Released: April 9, 1987

By the Commission:

I. INTRODUCTION

1. The Federal Communications Commission (FCC) is amending Part 1 of its rules implementing the National Environmental Policy Act of 1969 (NEPA). This action categorically excludes certain FCC-regulated facilities and services from routine evaluation of their potential for environmental impact due to human exposure to radiofrequency (RF) radiation. Categories of facilities and services that are subject to the requirement for routine evaluation will be limited to those licensed or authorized under Parts 5, 25, 73, and 74 (Subparts A and G only) of the FCC's rules. In conjunction with this Order, the Commission is also issuing a *Third Notice of Proposed Rule Making*,¹ which proposes amending Part 80 of the FCC's Rules to provide for protection from potentially hazardous RF radiation from ship earth stations and from ship radar stations.

II. BACKGROUND

2. On February 26, 1985 the FCC adopted a *Report and Order* (R & O) and a *Further Notice of Proposed Rule Making* (*Further NPRM*) in the above-captioned proceeding.² The *Report and Order* amended the Commission's rules³ implementing the National Environmental Policy Act of 1969 (NEPA).⁴ It provided for environmental analysis of Commission actions that could result in non-compliance with applicable health and safety standards for human exposure to radiofrequency (RF) radiation. The rule amendment was adopted due to our concern that any significant impact on the human environment caused by excessive exposure to RF radiation should be considered as part of FCC procedures for licensing and approving transmitting facilities and operations. The rule amendment requires that Environmental Assessments (see footnote 3)

be submitted with applications for construction permits, licenses to transmit or renewals thereof, or modifications to existing facilities if the facility in question would cause the identified health and safety guidelines for RF radiation to be exceeded.

3. Our rule amendment provided for Commission reliance on a widely supported, non-government safety standard for exposure to RF radiation.⁵ The rule amendment initially applied only to facilities and operations authorized under the following Parts of the FCC's Rules and Regulations: (1) Part 73 (radio and television broadcast); (2) Part 74, Subparts A & G (experimental broadcast, low power television, and television translator stations); (3) Part 25 (satellite communications); and (4) Part 5 (experimental radio other than broadcast).

4. The *Further NPRM* proposed the "categorical exclusion" of most other facilities and operations from the provisions of this rule amendment. This proposal was based on our belief that the transmitters involved generally do not individually or cumulatively have a significant effect on the "quality of the human environment."⁶ They are, therefore, subject to categorical exclusion as allowed by regulations of the Council on Environmental Quality (CEQ).

III. DISCUSSION

5. In response to the Commission's *Further NPRM*, a total of thirty-three filings of comments and reply comments were received. Respondents included individuals, major corporations, professional and trade associations, a labor union, and a U.S. Government Agency. A list of all parties filing comments in this proceeding can be found in Appendix B. The *Further NPRM* requested comment on a list of ten specific questions. Much valuable data and information were submitted in response to these questions, and they have been summarized in Appendix C.

6. With a few exceptions respondents to the *Further NPRM* generally supported the Commission's proposal for categorical exclusion of certain classes of services from environmental evaluation. There was some disagreement, however, over which facilities and operations should be excluded.

7. Much of the information submitted indicated that because of relatively low operating powers, intermittent use (low duty factors), and relative inaccessibility, there was little evidence that the services identified for exclusion could routinely create situations where the ANSI guidelines would be exceeded. The general tone of most industry comments was expressed by Motorola, Inc.'s statement, regarding land-mobile facilities, that it would be "highly unlikely that humans will experience worst case field strengths, and, in fact, the levels that will be experienced are in the vast majority of the cases substantially below those permitted by the ANSI standard."

8. A notable exception to the support expressed for many of the proposed exclusions was expressed by the U.S. Environmental Protection Agency (EPA). Objections to certain of the proposed exclusions were also filed by W.M. Lennox and Claire Stern Associates, Inc. EPA contended that "[m]any of the systems proposed as categorical exclusions can produce exposures that may exceed the exposure limits, particularly workplace exposures, recommended by the ANSI guidelines." EPA continued that "[s]uch actions should, in our view, be subject to environmental analysis to determine their potential impacts.

Where limits may be exceeded a full EIS (environmental impact statement) should be prepared." As can be seen from the summary in Appendix C, many of the other respondents disputed EPA's contentions in this regard and pointed out that EPA had not submitted specific evidence or data to support its position.

9. Although GTE Corporation generally supported most of the proposed categorical exclusions, it suggested that for some of the more questionable types of facilities where the possibility of excessive exposure might exist the FCC "could require licensees to make some showing of arrangements to restrict or control access to areas where levels are estimated or measured to be excessive." GTE raised the question as to whether the Commission's exclusion of some services would not constitute an "escape" from an implied NEPA responsibility. GTE suggested that the Commission may wish to consider "specific conditions written into licensees' authorizations and an underlying educational process accompanying operator licensing, to generate an awareness of the RF exposure subject, and of the power density or electric-field magnitudes likely to be laid down by an operated facility.

10. With regard to land-mobile (including cellular radio) and amateur facilities, a great deal of data and supporting material was submitted (see Appendix C). Motorola summed up its comments by stating that "[t]he factual and theoretical data presented . . . support the Commission's preliminary decision to categorically exclude [sic] land-mobile stations from its amended rules . . ." Motorola maintained that the location and low power of land-mobile base stations causes time-averaged exposures of the public and in the environment generally to be "far below" the ANSI guidelines. As for mobile transmitters, according to Motorola, exposure of bystanders when averaged over six minutes would be well below the ANSI limits for specific absorption rate (SAR), even in conditions of close proximity. Proper installation of vehicle-mounted antennas, Motorola emphasized, is the best way to minimize exposure of users and of the public.

11. In its comments, the American Radio Relay League, Inc. (ARRL) supported the categorical exclusion of amateur facilities. ARRL maintained that because of the "fundamentally intermittent nature" and relatively low power of amateur operations the majority of amateur stations would create little likelihood of excessive public exposure to RF radiation. ARRL stated that in the few instances where levels might cause concern, specialized communications techniques were involved, which could be best controlled by operator education. ARRL felt that operator education, e.g., through the use of RF safety questions as part of amateur examinations, was the most effective means of assuring compliance with RF exposure guidelines.

12. ARRL pointed out that it would be "administratively intractable" for the Commission to try and institute environmental evaluation at the time an amateur radio application is presented. Given the various frequency privileges and the ten-year license period, ARRL contended that "no applicant could predict all modes and station configurations to be used during the term of the license." The ARRL urged the Commission to require that applicants for amateur licenses know how to recognize station configurations where high RF energy levels could be created and that safety-related questions be included in amateur radio examinations. ARRL offered to assist in the development of such questions. ARRL also

urged the Commission to issue periodic and comprehensive bulletins on the topic of RF radiation safety with information on standards, evaluation, and other related matters included.

13. Broadcast interests generally favored the proposed categorical exclusion of most broadcast auxiliary facilities and operations. Evidence was presented supporting the Commission's preliminary conclusion that such facilities afford little likelihood of human exposures in excess of the indicated guidelines.

14. Categorical exclusion of point-to-point microwave radio, cellular radio, and other relatively low-powered communications systems was supported by the majority of those respondents discussing these types of facilities, such as AT&T, AvanteK, Inc., and MCI Telecommunications Corporation. AT&T, for example, pointed to measurements and calculations made by Bell Laboratories and others indicating that typical exposure levels of workers and the public to point-to-point microwave radio and certain land-mobile systems, such as cellular radio, would not constitute significant exposure hazards. Exposure levels due to such facilities are typically one-thousand times or more lower than the ANSI limits, according to AT&T.

IV. CONCLUSIONS

15. After considering all comments filed in this proceeding, we have reached the conclusion that our original proposal for categorical exclusion of these services is justified. Most respondents generally favored our proposal and submitted technical data and information to support it. This information was instrumental in confirming our tentative opinion that there is little likelihood for the identified transmitting facilities to cause exposures in excess of the RF safety guidelines.

16. We have not seen any evidence that excessive exposures, i.e., those in excess of the ANSI RF protection guides, result during routine and normal operation of land-mobile and fixed communications services, including cellular radio, microwave point-to-point radio, and most auxiliary broadcast services. We take note of the comments of EPA in which the exclusion of land-mobile facilities is questioned. However, no data or specific examples were presented to support EPA's position, and data submitted by other respondents are persuasive in showing that excessive exposure is unlikely. Therefore, until such time as contradictory evidence is brought to our attention, we are adopting our original proposal to exclude these types of transmitting facilities from routine environmental evaluation with respect to RF radiation. Accordingly, applicants for facilities licensed under Parts 21, 22, 23, 90, 94, and other appropriate Parts of the FCC's Rules are not required to routinely submit environmental information concerning exposure to RF radiation.

17. We are aware of the conclusions of the study by Drs. Guy and Chou⁸ with regard to vehicle-mounted transmitters operating in the 800-MHz band. i.e., that such antennas operating with input powers greater than 35 watts could cause power density or field strength levels to exceed the ANSI recommended limits in the immediate vicinity of the antenna. However, because of time-averaging and generally low duty factors, we believe that the likelihood of the protection guides actually being exceeded is slight, and we do not feel that the evidence supports requiring full-fledged environmental evaluation of each application for a land-mobile license."

18. With regard to land-mobile base stations and other fixed facilities, we do not believe that environmentally significant exposure is possible due to the relative inaccessibility of such antennas and their relatively low operating power levels. However, for these facilities, and for all excluded cases, we emphasize that Sections 1.1307(c) and 1.1307(d) of the FCC Rules, as amended, allow for Environmental Assessments if evidence is presented to the Commission that a heretofore excluded facility or operation may have significant environmental impact, e.g., with regard to exposure to RF radiation.

19. Regarding amateur radio facilities, no specific evidence has been submitted that these facilities present a significant risk to the public that would warrant routine environmental evaluation. While, hypothetically, RF radiation limits could be exceeded in a few instances, such situations apparently seldom occur in actual operation. Furthermore, because amateur stations are not individually licensed by frequency, modulation, power output, or location, it would not be administratively feasible to evaluate amateur applications for this environmental factor. Consequently, we find that amateur radio operators, at the time of licensing, should not be required to routinely submit environmental information concerning exposure to RF radiation. Nevertheless, as an added precaution, we agree with the ARRL that operator education would help to assure compliance with ANSI guidelines. In that connection, RF radiation safety questions are being incorporated into amateur examination study guides. We expect the ARRL to fulfill its promise to assist in that regard, and, generally, in educating amateur operators concerning the issue of exposure to RF radiation.

20. In our *Further Notice* we had also proposed to include ship earth stations in the category of facilities to be routinely evaluated for RF radiation under the Part 1 rule amendment. There was disagreement over whether such action was supportable, as can be seen from responses to Question (i) in the *Further Notice*.

21. After considering all comments, we still believe that our proposal to require evaluation of potential exposure from ship earth stations is a reasonable and supportable action and is necessary to assure the Commission that it is fulfilling its NEPA responsibilities. However, we have modified our original proposal for inclusion of ship earth stations and, by means of a *Third Notice of Proposed Rule Making*,¹⁰ we are now proposing a different approach for minimizing potential environmental impact due to RF radiation from these transmitters.

22. As explained in the *NPRM*, our new approach involves amending Part 80 of the FCC's Rules so that users of these transmitters will be expected to comply with the ANSI RF radiation protection guidelines and manufacturers will provide them with the necessary information to do so. We are also proposing to apply the guidelines to ship radar stations. We are proposing the inclusion of ship radar stations due to their relatively high peak power densities and their relative accessibility to users and others. Several respondents to the *Further Notice* pointed out that such stations could cause excessive exposures if not properly installed and operated.

23. We believe that this new proposal would be administratively much more feasible than requiring separate environmental analysis of each and every application for these stations, as originally proposed for ship earth stations. In effect, by amending Part 80, ship earth stations and ship radar stations would be categorically excluded

from the provisions of the Part 1 rule amendment, as long as they will comply with the RF protection guidelines referenced in Part 80. Through the *Third NPRM* we are requesting comment on this proposal.

V. SUMMARY

24. This *Second Report and Order* amends Part 1 of the FCC Rules and Regulations to provide for the categorical exclusion of certain services from evaluation with respect to environmental RF radiation. Categories of transmitting facilities and operations subject to this type of evaluation will be limited to those authorized under Parts 5, 25, 73, and 74 (A&G only) of the Rules. Others will be excluded from routine evaluation under this rule amendment. In conjunction with this *Order* we are also issuing a *Third NPRM* proposing to amend Part 80 of the Commission's Rules to provide for protection from potentially hazardous RF radiation from ship earth stations and from ship radar stations.

VI. FINAL REGULATORY FLEXIBILITY ACT ANALYSIS¹¹

I. Need and purpose of this action:

This action excludes categorically certain FCC-regulated services from a requirement for routine environmental evaluation with respect to radiofrequency (RF) radiation. Such action is being taken to limit environmental processing only to those facilities and operations for which significant environmental impact could occur with respect to RF radiation. Categorical exclusion reduces unnecessary regulatory burden and paperwork.

II. Issues raised by the public in response to the Initial Regulatory Flexibility Act Analysis:

No comments were received addressing the Initial Regulatory Flexibility Analysis.

III. Significant alternatives considered and rejected:

Because of the Commission's legal obligations under the National Environmental Policy Act, the only reasonable alternative to this action would be to require an environmental evaluation of each facility. That alternative has been rejected as unnecessary and impractical. Our categorical exclusion of certain services will minimize impact on small entities to the greatest extent feasible.

VII. PAPERWORK REDUCTION ACT

This item has been analyzed with respect to the Paperwork Reduction Act of 1980 and found to contain no new or modified form, information collection and/or record-keeping, labeling, disclosure, or record retention requirements; and will not increase or decrease burden hours imposed on the public.

VIII. ORDERING CLAUSES

Accordingly, IT IS ORDERED that, effective May 26, 1987, Part 1 of the Commission's Rules and Regulations, Chapter I of Title 47 of the Code of Federal Regulations, IS AMENDED as set forth in Appendix A, and that this amendment will be applicable to applications filed on or after this effective date.

This action is taken pursuant to the provisions of Sections 4(i), 4(j), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 154(j) and 303(r), and Section 553 of the Administrative Procedure Act, 5 U.S.C. Section 553.

Further information on this matter may be obtained by contacting Dr. Robert Cleveland, Office of Engineering and Technology, (202) 653-8169.

FEDERAL COMMUNICATIONS COMMISSION

William J. Tricarico
Secretary

APPENDIX A

Part 1, Chapter I of Title 47 of the Code of Federal Regulations is amended as follows:

Part 1 Practice and Procedure

1. The authority citation for Part 1 continues to read:

Authority: Secs. 4(i), 4(j), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. 154(i), 154(j), and 303(r).

2. In Section 1.1307, the note in paragraph (b) is revised to read as follows:

§ 1.1307 Actions which may have a significant environmental effect, for which environmental assessments (EAs) must be prepared.

(b) ***

NOTE: The provisions of paragraph (b) shall only apply to facilities and operations licensed or authorized under Parts 5, 25, 73, and 74 (Subparts A and G only) of the FCC Rules and Regulations. Facilities and operations licensed or authorized under other Parts or Subparts of the FCC Rules and Regulations shall be categorically excluded from consideration under this paragraph unless such exclusion is superseded by actions taken by the Commission under the provisions of paragraphs (c) or (d) of this section.

APPENDIX B

Respondents to Further Notice of Proposed Rule Making.
(Listed Alphabetically)

- (1) American Institute of Merchant Shipping
- (2) American Radio Relay League, Inc.
- (3) American Telephone and Telegraph Company
- (4) Avantek, Inc.
- (5) Bonneville International Corporation
- (6) Communications Satellite Corporation
- (7) Central Committee on Telecommunications of the American Petroleum Institute
- (8) Electromagnetic Energy Policy Alliance
- (9) United States Environmental Protection Agency
- (10) GTE Corporation
- (11) W. M. Lennox
- (12) Magnavox Advanced Products and Systems Company
- (13) MCI Telecommunications Corporation
- (14) Motorola, Inc.
- (15) The Association of Maximum Service Telecasters ("MST")
- (16) National Association of Broadcasters
- (17) National Broadcasting Company, Inc.
- (18) NYNEX Mobile Communications Company
- (19) Operating Telephone Companies:
 - The Bell Telephone Company of Pennsylvania
 - The Chesapeake and Potomac Telephone Companies
 - The Diamond State Telephone Company
 - Illinois Bell Telephone Company
 - Indiana Bell Telephone Company
 - Michigan Bell Telephone Company
 - Nevada Bell
 - New England Telephone and Telegraph Company
 - New Jersey Bell Telephone Company
 - New York Telephone Company
 - The Ohio Bell Telephone Company
 - Pacific Bell
 - South Central Bell Telephone Company
 - Southern Bell Telephone and Telegraph Company
 - Southwestern Bell Telephone Company
 - Wisconsin Bell, Inc.
- (20) Radio Officers Union, District 3, of the National Marine Engineers' Beneficial Association, AFL-CIO
- (21) Telocator Network of America's Cellular Telecommunications Division
- (22) TV Broadcasters All-Industry Committee
- (23) Utilities Telecommunications Council

REPLY COMMENTS:

- (1) American Institute of Merchant Shipping
- (2) American Radio Relay League, Inc.
- (3) American Telephone & Telegraph Company
- (4) CBS, Inc.
- (5) Claire Stern Associates, Inc.
- (6) Communications Satellite Corporation
- (7) COMSAT Technology Products
- (8) MCI Telecommunications Company
- (9) Operating Telephone Companies
(see list in 19 above)
- (10) Society of Broadcast Engineers
- (11) Telocator Network of America

APPENDIX C

Summary of Responses to Specific Questions

Question (a): What typical and "worst case" electric and magnetic field-strength levels occur near RF transmitters in areas that are accessible to the public or to workers? How were these levels determined? How likely is it that people would be exposed at "worst case" levels? Of special interest are: (1) base stations and mobile stations in the private land-mobile and common carrier services, (2) amateur radio stations, (3) other fixed and mobile transmitters operating at relatively low power levels, and (4) shipboard-satellite earth stations.

(1) Land-mobile and common carrier

1. Motorola, Inc. submitted extensive comments relevant to Question (a) and land-mobile facilities. Over the past ten years Motorola has surveyed most of its land-mobile base stations for purposes of ensuring safety of maintenance and repair personnel. According to Motorola, at some locations, shared with broadcast facilities, there are "hot spots" where both electric and magnetic field strength levels are higher than average field intensity levels at the sites. At one such site Motorola had to relocate a transmitter due to average power density levels that were in excess of 5 mW/cm with hot spots of up to 450 V/m. When broadcast antennas are present at a site exposures can be higher if special precautions are not taken. However, Motorola noted that at the great majority of antenna sites workers maintaining and installing land-mobile base stations are exposed to power densities below 1 mW/cm.

2. With respect to land-mobile base stations not located at broadcast sites, Motorola stated that the "worst case" is probably represented by a low-directivity antenna, e.g., a three-element Yagi, radiating 250 W and located at head level about 2 meters away from a worker. Such a situation could result in exposure of the worker to about 1.7 mW/cm over most of his body. However, Motorola continued, such a situation is likely to occur "only in a crowded site with tight antenna-mounting grids." Motorola indicated that there are only a few such sites in the country, and "[s]pecial precautions are provided for Motorola service personnel at these sites." Furthermore, Motorola maintained that "[t]he possibility of members of the general public being exposed to the RF power levels just mentioned is practically nil" and that all of the high readings were detected in maintenance areas where members of the general public have no access.

3. With respect to vehicle-mounted, land-mobile antennas, Motorola pointed out that exposure to bystanders depends on radiated power, frequency, and, most importantly, on the installation and accessibility of the antenna. "Worst case" field strengths at 5 cm radial distances from quarter-wave resonant whip antennas were reported by Motorola. For 100 W radiated power, field strengths were: 4.5 A/m (magnetic field) for 30-800 MHz transmitters, 1030 V/m (electric field) for 450 MHz, and 1300 V/m for 800 MHz. In all cases the E-field peaks occurred near the antenna tip. According to Motorola, these close-in E-fields are "connected with energy storage more than energy transport," and experimental evidence indicates that "the maximum energy deposition in tissue near dipoles is not at the peak of the E-field, but at the peak of the H-field. While the reactive E-fields . . . collapse at the air-tissue interface, the low impedance magnetic fields penetrate tissue and deposit energy without substantial air-tissue interface reflection." These fields diminish rapidly with increasing distance from the antenna. However, at VHF frequencies and below it has not been possible to establish simple propagation laws, since the metal structures of the vehicles become a part of the antenna and fields become unpredictable.

4. Motorola thought it possible for a person to be exposed at or near ANSI levels if close enough (30-50 cm from a 100 W mobile antenna), but when duty factors (time averaging) are considered exposure would be reduced below the ANSI recommended protection guides. According to Motorola, mobile antennas are usually mounted on the roof, center of the trunk, or trunk lip. A casual bystander "in general, has no reason or motivation to stand, immobile, at a close distance from a vehicular antenna for a long period of time." Motorola noted that the best way to avoid the "unlikely" event of overexposure of a bystander 30 cm or less from a mobile antenna was simply for the operator not to transmit in such a situation. Motorola attaches a safety warning to its high-power, push-to-talk microphones cautioning the operator not to transmit if anyone is within 60 cm of the antenna.

5. Motorola concluded that "the experimental and the theoretical data collected over more than 10 years clearly indicate that the public at large and workers in general are not in danger of over-exposure by the ANSI standard from base station and mobile transmitters."

6. Land-mobile facilities were also the subject of comments submitted by the Operating Telephone Companies (OTC). With regard to vehicular-mounted systems, the OTC stated that worst-case exposures would be within a few inches of the antenna. However, an operator would not likely be that close to the antenna, especially since transmission would typically occur while the vehicle was in motion. Furthermore, according to the OTC, exposure levels inside mobile radio-equipped vehicles are normally less than 100 uW/cm, the units are typically in use less than 3% of the time, and maximum input power of the units used by the OTC is 30 W. In the case of land-mobile base stations operated by the OTC, the ANSI limits would be exceeded only within a few feet of the antenna center of radiation. The OTC pointed out that this area would not be accessible to the public, and standard practice is to de-energize such systems when employees or others are working on or near the antennas.

7. American Telephone and Telegraph Company (AT&T) responded to this question with information relevant to base and mobile stations in the cellular radio

service. With respect to cellular base stations, AT&T provided data from measurements made in areas accessible to employees and areas normally accessible to the general public. The base station studied consisted of a colinear array of half-wave dipoles with a net gain of about 9 dB over a standard half-wave dipole.

8. Measurements were made along the axis of a roof-mounted cellular base station antenna and were normalized to 16 transmitters (approximately 1600 W ERP). The plane-wave equivalent power density limits recommended by ANSI for the cellular frequency band were not exceeded at radial distances from 2.3 to 44.3 feet from the antenna axis. Furthermore, maximum measured levels occurred at points inaccessible to a person standing on the roof.

9. Data normalized to 48 transmitters (approximately 4800 W ERP) was obtained showing plane-wave equivalent power density in the main beam of the antenna. The measurements indicated that the equivalent power density in the main beam of the base station antenna was well below the ANSI protection guides at all distances greater than a few feet from the antenna.

10. Data were also provided by AT&T for ground-level measurements made near a cellular base station mounted on a 150-foot mast. The "worst case" would occur when the base station was fully loaded, e.g., if 96 transmitters were on the same antenna. In such a case the maximum ground-level power density would be approximately 2 μ W/cm² at a point 100 feet from the base of the mast. The intermittent operation of the system would reduce exposure even further.

11. With regard to mobile cellular stations, AT&T referred to the study (referenced in footnote 15 of the *Further Notice*) made at the University of Washington by Drs. Guy and Chou. The purpose of the study was to document typical and "worst case" exposure levels and specific absorption rates (SAR's) for vehicle occupants and bystanders in the vicinity of roof-mounted and deck-mounted antennas transmitting in the 800-MHz band. Worst-case exposure conditions were considered to occur when an individual was at the closest possible distance from the antenna. Several configurations were tested using both adult and child "phantom" models. Both electric fields and SAR were measured.

12. The results of the study showed that the highest exposure level (2.2 mW/cm²) corresponded to the model of a woman in close proximity (9.7 cm) to the deck-mounted antenna operating at a power of 3.5 W. Although this level approaches the ANSI protection guide for this frequency, the antenna could be driven with approximately 35 W before the 8 W/kg peak SAR identified in the ANSI exclusion clause would be exceeded. According to AT&T, the intermittent nature of the operation and the improbability that a person would spend a significant amount of time so close to the antenna indicates that such a worst-case exposure would be unlikely.

13. NYNEX Mobile Communications Company supported the proposal to categorically exclude land-mobile operations, particularly cellular stations, and NYNEX concluded that the ANSI standard "far exceeds" radiation levels from cellular facilities. NYNEX pointed to AT&T's analysis with 96 base station transmitters showing that ground-level power densities would be well below 1 mW/cm². According to NYNEX, the actual maximum loading of any cellular base station site would be 45 transmitters with maximum ERP of 1000 W each, and

measurements made at ground level and in the immediate vicinity of the antennas have demonstrated that power densities were well below even the most restrictive standards. NYNEX also pointed out that a further safety factor results from the fact that simultaneous transmission from all transmitters at a given site is unlikely in actual system operation.

14. Telocator Network of America also maintained that the categorical exclusion of cellular facilities was justifiable. Telocator pointed to the relative inaccessibility, the relatively low power levels, and the intermittency of cellular operations as supporting the exclusion. With respect to land-mobile facilities in general, this position was also taken by the Utilities Telecommunications Council in supporting the proposed categorical exclusion.

15. Telocator, in reply comments, agreed with the previously described statements of Motorola regarding land-mobile facilities and also noted that base and mobile stations in the Radio Common Carrier (RCC) service "are restricted to lower powers than are most private radio facilities." Maximum ERP's for base stations (150 and 450 MHz) are 500 W, and, although the duty factor may be higher than for dispatch systems, mobiles are limited to 60 W output power. Telocator pointed out that private radio base stations are limited to 350 W output power which permits "far greater" ERP's.

16. In response to Question (a), the U.S. Environmental Protection Agency (EPA) submitted comments at variance with those of most other respondents. According to EPA, exposures "well above" ANSI limits can exist close to base stations and mobile antennas in the land-mobile and common-carrier services. Furthermore, EPA maintained, "[t]he possibility for such exposures to workers indicate [sic] that these facilities should not be routinely categorically excluded from all NEPA analysis.

17. GTE Corporation agreed to some extent with EPA by stating that for some configurations of cellular and land-mobile facilities far-field power density could exceed ANSI limits. However, GTE proposed that such facilities "can be regulated *pro forma* by requiring licensees in their applications or renewals or modifications to certify to having credible predictions of the fields . . . to have made arrangements to control or restrict access where levels are estimated or measured as excessive, and to be able to provide a showing upon request."

18. AT&T took issue with EPA's comments regarding land-mobile facilities, labeling EPA's statements as "both unsubstantiated and misleading." AT&T pointed out that the complete ANSI protection guides and their derivation, and not just incident power density values, must be taken into consideration. AT&T noted that the ANSI protection guides are based primarily on threshold values for specific absorption rate (SAR), and the University of Washington study [see Question (f)] had shown that under "highly unusual and extreme" exposure conditions (3-4 inches from a vehicle-mounted, 800-900 MHz antenna) the ANSI exclusion threshold (8 W/kg) was not exceeded, even though the measured and calculated power density exceeded the ANSI limits by a factor of nine.

19. With regard to land-mobile base stations, AT&T maintained that although a maintenance worker could, under "very unusual circumstances," be exposed to power densities above the nominal ANSI limits, such exposure would only be under near-field conditions, and the resulting SAR would be lower than that predicted for the corresponding ANSI far-field limit. AT&T also disagreed

with GTE's statement that cellular base station antennas, when roof-mounted, could produce exposure levels in excess of ANSI limits at points accessible to the general public. According to AT&T, measurements have shown that for normal mounting configurations the maximum power density associated with roof-mounted cellular base station antennas is above head height. AT&T continued, power densities are "well below" the ANSI limits at points close to the antenna, in antenna sidelobes, and at accessible points in the main beam but far from the antenna.

20. MCI also disagreed with EPA's position with respect to land-mobile facilities, contending that EPA's statements were "particularly vague" and provided no data to support the recommendation against categorical exclusion. Similarly, OTC did not feel the EPA position to be supportable. OTC presumed that EPA was concerned over potential worker exposure during antenna maintenance or repair work. However, OTC contended, system operators can and do use proper precautionary procedures to avoid hazardous exposures during antenna work, and the situation of concern to EPA is an intermittent one easily handled by appropriate operator procedures.

21. Opposition to the EPA comments were also registered, in reply comments, by the Society of Broadcast Engineers (SBE). SBE noted that its members routinely are involved with the construction, operation, and maintenance of the transmitting equipment proposed for categorical exclusion. SBE claimed that the EPA's comments were "cautionary and negative" and "were not supported by factual information."

(2) Amateur radio stations

22. The American Radio Relay League (ARRL) provided extensive comments with respect to amateur radio operations. According to ARRL the "worst case" potential for exposure would result from high duty-cycle transmissions such as those involving RTTY (radioteletypewriter), SSTV (slow-scan television), FAX (facsimile), and FM (frequency modulation). A worst-case scenario would assume operation at maximum peak-envelope power of 1500 W, a ground-mounted vertical monopole antenna, and operation in the 50-MHz amateur band. It also assumes that the area surrounding the antenna would be accessible to the public.

23. ARRL maintained that such a worst-case scenario is unrealistic. A more likely "real life" situation might involve an RTTY operation utilizing maximum power and transmitting in the 40 meter (7.5 MHz) band with a ground-mounted vertical monopole. Even this, however, would be a rare situation, and, for measurement purposes, ARRL was unable to locate an actual amateur station that came close to the "real life" or to the "worst case" scenarios.

24. ARRL concluded that the possibility of excessive exposure to the public could best be avoided by simply limiting public access to stations. According to ARRL, "since most amateur stations are located on private property, this is easily, and is now routinely, accomplished." Furthermore, "[g]iven the intermittent nature and the relatively low power levels used in the amateur service," restriction of access should only be necessary within a "few feet" of a tower.

25. GTE Corporation, commenting on the amateur service, noted that a 29.5-MHz vertical monopole antenna could, though rarely is, be used with full legal power of

1500 watts and with RTTY or FM requiring a restriction area of about 5 meters radius around the antenna to comply with ANSI limits.

26. EPA recommended that the Commission reconsider its proposal to exclude amateur radio facilities from routine RF environmental evaluation. According to EPA, certain amateur facilities using maximum transmitter powers of 1500 W with high-gain antennas (20 dBi) "are capable of producing exposures well above ANSI limits and therefore should not be categorically excluded from environmental review."

27. In its reply comments ARRL responded to EPA's recommendation. According to ARRL, "[t]he overwhelming [emphasis in original] preponderance of amateur radio facilities comply with the ANSI C95.1-1982 standard." ARRL maintained that most amateur radio stations use power levels well below the maximum permitted and use relatively low-gain antennas. Furthermore, ARRL stated, amateur on-the-air operations are almost always intermittent, and during periods when a station is "operating" most of the time is devoted to the reception of signals. ARRL continued, "[t]he League has found it difficult to find, even for testing purposes, real-life station configurations that generate sufficiently high RF energy levels to even approach ANSI limits." As mentioned previously, the ARRL felt that operator education was the best way to assure compliance with RF environmental guidelines.

(3) Other low-powered fixed & mobile transmitters

28. Avantek, Inc. provided data on terrestrial microwave transmitting facilities. According to Avantek, all three ANSI criteria (power density, whole-body SAR, and peak SAR) are inherently met by microwave domestic radio facilities. Because the microwave beam at the antenna surface would have a projected area of at least one sq. meter (10,000 sq. cm), an (unlikely) power level of 50 watts would be necessary to produce the 5 mW/cm ANSI limit at the antenna surface. With regard to the whole-body SAR limit, Avantek maintained that a body weight as low as 50 kg would have to completely absorb all of the power from the antenna to exceed the guidelines. This would be unlikely since the antenna would not efficiently couple energy to the human body and less than one-half of the power could be absorbed even if a person's body could fill the entire area of the beam. Such scenarios are, of course, unlikely and would also have the effect of disrupting service. Avantek pointed out that microwave point-to-point antennas are installed in such a way that they are generally inaccessible to the public to facilitate unimpeded transmission.

29. In summary, Avantek stated that, "[t]he inherent design, the operating characteristics, and the location of terrestrial microwave transmitting facilities make them unlikely to cause excessive public exposure to RF radiation." Categorical exclusion, Avantek continued, will avoid "unnecessary burden" on industry and is in accordance with the Council on Environmental Quality's regulations intended "to reduce superfluous paperwork and accumulation of data."

30. MCI Telecommunications Corporation also submitted comments regarding terrestrial point-to-point microwave facilities. Based upon earlier measurements, calculations, and reviews of the literature, MCI stated that RF power densities created by terrestrial microwave systems are "many orders of magnitude below the levels allowable by the [ANSI] standard . . ."

31. To confirm this conclusion MCI, in 1985, conducted measurements in and around a large microwave facility near Atlanta. This station is typical of many of MCI's larger microwave stations, both in terms of the number of transmitters and the height of the transmitting antennas. Also, the Atlanta facility utilizes higher-powered FM technology which presents a "worst case."

32. Measurements were made by MCI five feet above the ground at increasing horizontal distances from the tower along the azimuth of the "most heavily equipped" 6-GHz route. Similar measurements were made along the 4-GHz route. The highest power density measured was 0.009 uW/cm. MCI pointed out that this figure is several orders of magnitude below the ANSI protection guideline of 5 mW/cm. Measurements made inside of a building housing microwave equipment were even lower, with the highest level recorded as 5000 nanowatts/cm (nW/cm).

33. Even if the transmitting antennas at the facility were increased to the maximum practical number, MCI noted that the extrapolated ground-level power density would still be far below the ANSI limit. MCI also pointed out that the lowest transmitting antennas are "rarely below 100 feet above ground," thus adding an extra margin of safety. Even though, MCI made one measurement at a point 50 feet below the lowest antenna on the tower. The measured power density was only 0.012 uW/cm.

34. MCI said that it is increasingly moving toward digitally modulated transmissions and toward conversion of current FM analog systems to single sideband. These changes will result in the use of even lower power levels than current systems using FM technology, further supporting the case for categorical exclusion of terrestrial microwave facilities.

35. AT&T also submitted data relevant to point-to-point microwave radio facilities. Measurements were made at a height of 6 feet above ground under the main beam of several tower-mounted point-to-point microwave antennas. "Worst case" exposure levels in all cases were at least ten thousand times below the ANSI protection guides for microwave frequencies. Even directly in front of the antenna, aperture levels were in most cases below the ANSI limits. The maximum value across the aperture of a horn reflector antenna was determined to be about 1 mW/cm per 25 W of input power. Therefore, the total input power necessary to produce levels equal to the ANSI guides would be about 125 W, an atypical and extremely unlikely situation.

36. The OTCs' discussion of microwave point-to-point facilities indicated that typical exposures at the base and in the vicinity of these towers (including rooftop installations) are on the order of 1 uW/cm. Similarly, according to the OTC, ground-level power densities along the transmission path do not exceed 1 uW/cm. The OTC proposed a worst-case exposure scenario in which someone stood immediately in front of a microwave antenna. However, even in the case of a system carrying a full complement of channels in the 4, 6, and 11 GHz bands (which is unlikely), the OTC concluded that the exposure level would only be a few mW/cm, which would be below the ANSI limit of 5 mW/cm for these frequencies. Even then, according to the OTC, when employees work on such antennas the standard practice is to de-energize the system or to wear protective clothing.

37. Claire Stern Associates, Inc. ("CSA"), in reply comments, disagreed with the proposed categorical exclusion of microwave point-to-point facilities. According to CSA,

a microwave antenna in an urban environment could "send its beam grazing off the edge of an apartment terrace or window." It was CSA's view that each application for a license, renewal, or modification, without exception should include a description of the installation and calculations for radiation levels. CSA felt that "[i]t is vital that the accumulation of energy generated by antenna installations on top of buildings be calculated with each application."

38. The Association of Maximum Service Telecasters (MST) and other broadcast groups provided information regarding transmitters in the broadcast auxiliary services licensed under Part 74 of the FCC Rules. According to MST, because of low transmitter power, intermittent use, inaccessibility of the antennas, or highly directionalized transmissions "there appears to be no realistic possibility that broadcast auxiliary operations licensed by the FCC will exceed . . . [the ANSI limits]." MST noted that each of the broadcast auxiliary services incorporated at least one of these factors. MST felt that there is "no basis at the present time for subjecting broadcast auxiliary operations to the environmental processing rules pertaining to RF radiation. Examples were given by MST to support its position.

39. MST noted that remote pickup base stations, licensed under Part 74, Subpart D, generally have antennas mounted on towers or inaccessible rooftops at heights of 100 feet or more above ground and are only visited occasionally by maintenance personnel when the transmitter would be shut down. According to MST, for a 160-MHz base station with 500 W power the ANSI limits would be exceeded at a distance of approximately 2 meters from the antenna. A 450-MHz station would cause the limits to be exceeded at a distance of about 1.6m. MST contended that human exposure at these distances would be unlikely.

40. For mobile pickup units the exposure situation would be similar with distances of less than 1m being necessary for the ANSI levels to be exceeded. MST noted that persons outside the vehicle normally would not be that close to the antenna, and individuals inside the vehicle would be shielded by the metal roof. In the case of both fixed and mobile stations, intermittency of transmissions would further reduce the time-averaged exposure with typical transmissions lasting no more than 30 seconds. MST stated that longer transmissions do occur, such as for news coverage, but are no more than one-half of the ANSI six-minute averaging period. MST's conclusions with respect to Subpart D facilities were supported and reiterated by the TV Broadcasters All-Industry Committee (TVBAC).

41. For TV studio-transmitter links (STL) and inter-city relay units, licensed under Subpart F of Part 74, MST said that to exceed the ANSI limits a person would have to be in the main beam of the antenna, which would not be realistic since the transmission would be interrupted. Moreover, MST continued, the possibility of excessive exposure is further limited by the general inaccessibility of STL's and the high gain antennas used which restrict energy to a narrow beam. MST noted that ground-level power density due to STL's would rarely exceed 0.002 mW/cm.

42. The TVBAC noted that although TV pick-up stations are closer to ground level than fixed links, they require unobstructed paths and use high-gain antennas. According to the TVBAC, in the near-field of the typical

TV remote pick-up van, power density levels are well within the ANSI standard and are typically below 0.03 mW/cm.

43. The National Association of Broadcasters (NAB) basically agreed with MST and the TVBAC on the lack of evidence for excessive exposure from auxiliary broadcast facilities, noting that calculations show there is little likelihood that the public could be exposed in excess of the ANSI protection guides. NAB stressed the relatively low powers used (generally below 100 W output power), intermittent use, and general antenna inaccessibility.

44. Although the maximum permissible transmitter output power of remote pickup base stations is 100 W, NAB noted that, as a practical matter, no equipment is now made for achieving transmitter powers in excess of 40 W, and powers commonly used are below 40 W. As a worst-case example, NAB referred to a remote pickup base station operating at 152.87 MHz with 100 W output power and a maximum gain of 10 dB (maximum ERP of 1000 W). According to NAB, the maximum 1 mW/cm contour (the ANSI limit for this frequency) could extend 14 feet from the antenna in the main beam. Since these antennas are normally located as high as practicable on the main broadcast tower or atop a mast on a studio building, NAB maintained that "there is little likelihood that either the general public or station workers would be exposed to levels remotely approaching ANSI levels."

45. NAB also gave a worst-case analysis for an aural broadcast auxiliary station licensed under Subpart E of Part 74. These facilities are used for STL's, inter-city relay stations and microwave booster stations. When used as STL's transmissions are continuous throughout the broadcast day with power levels typically in the 7-10 W range. Assuming a maximum output power of 20 W with a gain of 20 dB (ERP 2000 W) NAB's calculations indicate that the ANSI limits would be exceeded up to about 11.4 feet in the main beam. However, NAB pointed out that such an exposure situation is unrealistic since a person in the main beam would seriously disrupt the intended communications and would become immediately apparent to the station operator. NAB continued, STL sites are generally inaccessible to all but authorized personnel who would be aware of the implications of placing themselves in the main beam.

46. The TVBAC agreed with NAB's position regarding Subpart E facilities, indicating that in the case of a 950-MHz aural STL the ANSI limits would only be exceeded within 2.0m in the main beam. Furthermore, the TVBAC continued, directivity and elevation is such that ground-level exposures are "several magnitudes below the [ANSI] level."

47. NAB's calculations showed that for TV broadcast auxiliary stations (Subpart F) at frequencies of 2, 7, and 13 GHz the ANSI limits could extend for up to about 9 feet in the main beam. This assumes a transmitter output power of 20 W and a gain of 20 dB. But for the same reason as discussed above, excessive human exposure would be unlikely. In the case of low-powered auxiliary stations, licensed under Subpart H of Part 74, NAB maintained that categorical exclusion was warranted in view of the maximum output power of 1 W or less. This point was also made by TVBAC in its comments.

48. Instructional Television Fixed Service (ITFS) stations (Subpart I) use typical output powers of 10 W, according to NAB, although 50 W output is possible under unusual circumstances. NAB estimated the worst case to

be a ten foot parabolic antenna with 35 dB gain (although typical gains are 13-15 dB) and an ERP of about 158 kW. The ANSI-recommended level for this frequency range (5 mW/cm could then extend about 81 feet from the antenna in the main beam. However, NAB continued, there would be little likelihood of excessive human exposure since an individual would have to be within 10 feet of the beam axis and within 81 feet of the antenna in this worst-case situation. NAB maintained that a properly designed ITFS system would essentially preclude obstructions in the beam path or public access to high RF levels.

49. NAB also discussed FM broadcast translator and booster stations licensed under Subpart L of Part 74. These stations transmit in the FM band with maximum transmitter powers of 10 W or less. According to NAB, antenna gain is typically less than 10 dB resulting in a maximum ERP of 100 W or less. Therefore, the distance from the antenna where the ANSI limits would be exceeded is about 4.5 feet, making excessive human exposure unlikely. The TVBAC supported this analysis. However, the TVBAC analysis indicated the distance for exceeding the ANSI limits to be within 2 meters, and the estimated upper limit for EIRP to be 200 W. The TVBAC also noted that normal height above ground for Subpart L antennas is 15 meters or more, and ground-level power density should be less than 0.002 mW/cm.

50. The National Broadcasting Company, Inc. (NBC) and CBS, Inc. (reply comments) agreed with the other broadcast groups regarding the Commission's proposal to exclude auxiliary broadcast facilities from routine environmental evaluation. NBC maintained that all of these facilities operate with relatively low powers, and RF levels in publicly accessible areas are well below ANSI's recommended limits. In the case of remote pickup and other low-powered auxiliary broadcast facilities, NBC said that the duty cycle is generally so short that any potential hazard would be kept to an absolute minimum. NBC also made the point that microwave facilities require unobstructed paths, and their low power and relatively high elevation make it unlikely that they could cause excessive human exposure.

51. Measurements made by NBC at remote pickup base stations and at mobile (vehicular-mounted) stations showed that high power densities were encountered only at very limited spots a few inches away from the antenna, and the fields dropped off rapidly with increasing distance. Measurements made inside vans used for electronic news gathering (ENG) showed levels below 1 mW/cm. NBC concluded that higher powered auxiliary broadcast stations in all categories are generally located at sites where access is restricted to authorized personnel and that neither the public nor employees would have any significant exposure from such sources.

52. The position of the broadcast groups with regard to broadcast auxiliary facilities can be summed up by the conclusion of the TVBAC that the proposed categorical exclusion "is justified by the fact that they operate with relatively low power and that those facilities which are not intermittent in nature are required to be so located that little exposure or radiated energy is imposed on either the public or workers using the devices."

(4) Shipboard-satellite stations [see Question (1)]

Question (b): What methods are available for predicting typical electric and magnetic field-strength levels in the vicinity of these transmitters, particularly in the near-field where human exposure might occur? Can field-strength levels be approximated by simple calculations or nomograms?

53. Those respondents addressing this question generally agreed that accurate prediction methods are available for many exposure situations. In response to this question, ARRL replied that calculational methods are available for accurately predicting field-strength values. As an example, ARRL mentioned a computer analysis of radiation from a quarter-wave monopole antenna transmitting at 7 MHz on a perfect ground plane at a power level of 1000 W. The analysis indicated that the magnetic-field limit recommended by ANSI was reached or exceeded within 1.2 m of the antenna, while the electric-field limit on the ground plane was well below the limit.

54. EPA also mentioned the availability of computer methods to predict field strengths. For example, the Numerical Electromagnetic Code (NEC) can be used to analyze fields around linear antennas. Geometrical theory of diffraction (GTD) techniques are available for analyzing fields resulting from reflector antennas.

55. For predicting fields around land-mobile equipment, Motorola reported on a series of theoretical and experimental investigations of the near-field of whip and helical dipole antennas. The major conclusions of these studies were as follows:

(1) The radial E-field can reach values that exceed ANSI limits for even small values of radiated power at distances close to the antenna (straightwire dipoles and helices). However, these fields are reactive in nature.

(2) No theoretical or experimental divergence of magnetic fields was found near these sources. The strong axially-directed magnetic field of helical antennas is confined within the antenna and is not accessible.

(3) It is possible, "with some care," to predict accurately human exposure due to the most commonly-used land-mobile antennas. For resonant dipoles or arrays of resonant dipoles, graphs and charts submitted by Motorola predict fields very accurately at distances closer than 0.1 times the wavelength. For greater distances, standard equations are available. For helical antennas, peak E-field values can be predicted using asymptotic methods for radial distances equal to half the length of a helical dipole. Beyond a sphere containing the helical source, far-field methods give results that are only approximately correct. For high-Q helical radiators, far-field analysis gives accurate results at radial distances greater than about 0.3 times the wavelength.

56. NYNEX noted that studies by Bell Laboratories have shown that standardized calculations can be used to predict E and H field-strength levels. These predicted values tend to be higher than values actually measured. This was also mentioned by the OTC. The OTC stated that calculation-based predictions can be used to estimate the upper bounds of potential exposure.

Question (c): What measurement equipment and procedures are available for determining typical field-strength levels around such transmitters, and how accurate are these measurements?

57. AT&T noted that during the last decade significant advances have been made in development of commercially available instruments suitable for measuring electric and magnetic fields in near-field regions and in leakage situations. According to AT&T, although virtually all of these instruments have certain undesirable characteristics that can lead to measurement error, when the user is aware of such problems accuracy of +4 dB (relative to field strength) can most likely be achieved under ideal conditions. It is AT&T's position that if it can be shown that exposure levels are less than 1/100 of given exposure guidelines then the exact [emphasis added] value need not be determined using more sensitive equipment.

58. AT&T pointed out that the performance of many of these instruments has been evaluated by the Center for Devices and Radiological Health of the U.S. Food and Drug Administration and by the U.S. Environmental Protection Agency. Furthermore, AT&T reported, two organizations, the American National Standards Institute (ANSI) and the National Council on Radiation Protection and Measurements (NCRP), are currently developing documents in which the characteristics and limitations of both broadband and narrowband instruments will be described in detail and in which specific measurement procedures will be recommended.

59. With regard to the amateur radio service, ARRL maintained, in response to Question (c), that measurement equipment and procedures available for measurement of potentially hazardous field strength levels are beyond the financial reach of a typical amateur licensee.

60. EPA noted that although measurement equipment and procedures exist, instrument stability can be a problem at low field intensities. Also, many instruments have problems at low frequencies, especially below 10 MHz, which can lead to measurement error.

61. GTE mentioned the existence of broadband antennas, directional antennas, and spectrum analyzers for use in making field measurements. In the microwave region (1 GHz) sensitive power meters equipped with horn antennas and appropriate filters are recommended. GTE proposed that when measurement data are submitted the instrumentation used should be identified along with a record of instrument calibration. GTE also recommended that the FCC, in cooperation with other agencies such as the National Bureau of Standards, the Center for Devices and Radiological Health, etc., should periodically publish a list of acceptable instruments, indicating estimated accuracies in use. According to GTE, maintenance of such a list would "provide incentive to the instrumentation marketplace for innovation and improvement."

62. Motorola maintained that, "commercially available instruments normally used for survey purposes fail miserably to give the correct values of E and H in the immediate vicinity of RF sources." However, if properly calibrated, such instruments do give "excellent" results at 15 cm or greater from an RF source. According to Motorola, measurements made in the immediate vicinity of a source may vary substantially with probe position and orientation. Because of these problems, "Motorola does not place much confidence in the precision of measurements taken much closer than 20 cm from the sources in the band 30-150 MHz and closer than 10 cm in the band

450-1000 MHz" using commercially available probes. Motorola noted that it has developed its own instruments for accurately measuring E and H fields in the laboratory in close proximity (less than 30 cm) to RF transmitters such as portable radios.

Question (d): Determination of compliance with time-averaged standards is dependent on a knowledge of the duty factor, i.e., the typical fraction of percentage of time that the equipment is actually transmitting. What are typical duty factors for land-mobile and other transmitters, particularly mobile units and how can duty factors best be estimated to determine compliance with health and safety standards for RF radiation.

63. ARRL provided information on duty factors with respect to amateur operations. According to ARRL, repeater stations, if used heavily, would have the highest duty factors among amateur facilities. However, due to their height above ground, relative inaccessibility, and statutory limitations on ERP, ARRL thought that excessive human exposure would be unlikely from these antennas. ARRL also mentioned high duty factors associated with beacon operations. However, because of the limited ERP of these stations and their relative inaccessibility, ARRL also thought them unlikely to cause excessive exposures.

64. EPA stated that amateur radio-teletype (RTTY) operations can have duty factors as high as 100%. Such operations, EPA continued, can proceed for as long as the six-minute averaging time specified by ANSI.

65. API expressed the view that only an industry-wide survey could accurately determine an "average" duty factor. API noted that usage patterns in the petroleum industry vary from a few seconds per transmission to more extended periods for transmissions from field technicians or drilling personnel.

66. Motorola provided comments on land-mobile duty factors and time averaging. Motorola reported that there have been extensive recent studies of land-mobile traffic which have confirmed average "message lengths." A "message length" is defined as "the sequence of content-related transmission between a base station and one mobile transmitter." There are three classes of message lengths: short (≤ 10 sec), medium ($10 \text{ sec} \leq \text{duration} \leq 20 \text{ sec}$), and long ($\geq 20 \text{ sec}$). Common mobile transmitters such as taxis, public safety vehicles, and private cars have average message lengths shorter than 20 seconds. Long messages are more typical of railway and construction mobile transmitters which normally operate in areas restricted to the public.

67. Motorola said that during a typical message there are pauses and receive intervals such that the actual mobile transmission time is less than one-half of the message duration. No statistical data are available on time intervals between channel re-use by the same mobile. However, Motorola continued, a typical land-mobile channel is shared by 30-50 vehicle transmitters. Therefore, it could be estimated that about a maximum 1:30 ratio would exist between message length and time interval between transmissions from the same vehicle.

68. Motorola estimated that, if one assumes: (1) a typical number of transmitters sharing a given channel, (2) one message per mobile every 10 minutes, and (3) 10 sec messages, then a duty factor is implied for any six-minute interval on the order of:

$$10 \text{ sec}/360 \text{ sec} = 1/36$$

69. The above analysis applies to mobile radio transmitters other than cellular mobile telephones. In the case of cellular radio, AT&T and Motorola have determined that the statistical distribution of holding time for cellular mobile calls is exponential with an average value of 100 sec. The peak utilization rate can be assumed to be 100 sec/user/hour, and, Motorola estimated, the average duty factor for a cellular mobile telephone is about 1/3. Motorola also can say with a "high level of confidence" that 1 out of 36 cellular mobile calls lasts the full ANSI time-averaging interval of six minutes. However, Motorola continued, at current levels of radiated power (3 W) there is no need to average over time to reduce exposure since the exposure guidelines would already be met.

70. NYNEX pointed out that cellular base stations operate with a continuously transmitting control channel while voice channels are operated intermittently depending on cell site loading. NYNEX estimated that transmissions from cellular mobile units typically vary from 1 to 3 minutes. GTE estimated that "we have to assume that a [cellular mobile] carrier may be present for an entire 6-minute period.

Question (e): Measurements reported by the Environmental Protection Agency and the National Bureau of Standards have indicated that electric field strength levels inside and outside of vehicles with roof-mounted land-mobile antennas could conceivably exceed the ANSI recommended limits [References omitted]. Are such field-strength levels typical for routine operations, and, if so, what measures could be taken to reduce them?

71. Motorola agreed that the E-field levels reported by EPA and NBS in and around vehicles with roof-mounted antennas are typical for routine installations. For frequencies in the VHF band and below, Motorola continued, E-field "hot spots" can be found in and around the vehicle cabin, but for center-of-roof-mounted antennas transmitting in the 450-MHz or 800-MHz bands these hot spots are practically absent. Motorola estimated that for the "worst case," with frequencies greater than 450 MHz and 100 W radiated power, exposure of vehicle passengers would be attenuated to less than the equivalent of 0.5 mW/cm due to propagation of the radiated waves over the metal roof and scattering and diffraction of waves at the roof edges.

72. For frequencies below approximately 450 MHz, Motorola said, the metal body of the vehicle, not just the roof, becomes more of a part of the antenna. Electrical charges will accumulate on the outside metal surfaces of the vehicle. These charges can leak into the cabin and cause E-fields at some locations, e.g., underside of roof, top of steering wheel, knob of hand brake, etc., that are considerably higher than background levels inside the cabin. Such fields are commonly associated with transmit frequencies of 30-70 MHz but are sometimes also found in the VHF band.

73. According to Motorola, these fields have an electrostatic character and are reactive in nature (high impedance). Motorola said that this is easily seen due to the absence of magnetic energy and can be demonstrated by measurements using H-field probes. Since the EPA and NBS studies only utilized E-field probes the reactive nature of these fields was not detected. Motorola continued.

74. These fields are substantially altered by the presence of vehicle passengers, according to Motorola, and "great variations" may exist in the strength of these reactive energies. However, Motorola maintained that since these fields are incident orthogonally on the human body the resulting values of specific absorption rate (SAR) would be "far below" those recommended by the ANSI RF protection guides.

75. Motorola pointed out that these E-field hot spots are common to all antenna installations, not only to center-of-roof-mounted installations, and that in some cases even higher E-field levels can be detected than those measured by EPA and NBS. These hot spots depend on the size, construction, and geometry of the vehicle, as well as the frequency of operation of the equipment.

76. ARRL expressed the view that mounting the antenna in the center of the roof was best for efficient transmission and also maximized shielding of the vehicle occupants. ARRL was more concerned about persons outside of the vehicle who were physically close to the antenna during transmission from, say, a parked vehicle. ARRL felt that operator education was the best way to deal with this problem, and ARRL said that it will help by publishing information advising mobile operators to check for the presence of persons near vehicle antennas before transmitting at high power levels.

77. API contended that under normal or routine conditions with most land-mobile equipment the ANSI RF protection guides would not be exceeded. It also felt that the best way to reduce exposure was through controlling operator procedures rather than through controlling transmitting systems.

78. NYNEX referred to measurements made by Bell Laboratories showing maximum power densities inside and outside vehicles that were at or below recommended exposure levels: at 12 inches from the antenna, and 10 mW/cm at 2.5 inches from the antenna. These measurements were made near mobile antennas in use during the Advance Mobile Phone Service (AMPS) trial in Chicago using a 10 W transmitter. NYNEX noted that since current cellular mobile antennas use 3 W output the predicted power densities should be about 1/3 of the above values.

Question (f): Section 4.2 of the ANSI protection guides provides that at frequencies between 300 kHz and 100 GHz, "the protection guides may be exceeded if the exposure conditions can be shown by laboratory procedures to produce specific absorption rates (SARs) below 0.4 W/kg as average over the whole body, and spatial peak SAR values below 8 W/kg as averaged over any one gram of tissue." A recent report [see *Further Notice*, footnote 15, for reference] on human absorption of RF energy from vehicle-mounted cellular radio antennas concluded that the mobile-antenna system can be operated safely "... with in the guidelines of the ANSI exclusion clause for input powers up to 35 W." In view of the fact that Section 90.635(d) of the FCC rules and Regulations allows 800 MHz mobile station output powers of up to 100 watts, what is the likelihood that such stations would cause human absorption of RF energy in excess of the ANSI limits?

79. Motorola and API noted that the Guy and Chou study showed that vehicle occupants are effectively protected by the metal body as shown by measurements of SAR. According to Motorola, the vehicle body offers a protection factor of about 20. NYNEX commented that the Guy and Chou study showed that cellular mobiles using 3 W power were "well within the guidelines." However, the study also showed that peak SAR can exceed the ANSI limit of 8 W/kg at distances very close to the antenna.

80. Motorola reported the results of studies using sleeve dipoles and flat phantoms showing that peak SAR from a half-wavelength, efficient radiator at 800 MHz is as high as 4 W/kg per radiated W at 1.0 cm distance from the antenna and 0.45 W/kg per W at 5.0 cm. However, for roof-mounted 800-MHz antennas much lower peak SAR's (0.052 W/kg per radiated watt) were detected by Motorola at distances from the antenna where people would be expected to stand. Motorola felt that proper installation of the radiator, either in the center of the roof or the center of the trunk, was the best way to control exposure.

81. Motorola also tested 450-MHz systems and found peak SAR's about one-half those found in the study by Guy and Chou for 800-MHz systems. The Motorola results indicated that the ANSI peak SAR limit of 8 W/kg could be exceeded with about 70 W radiated power at 450 MHz.

82. However, in both cases Motorola noted that due to time-averaging (see discussion of duty factors) actual exposures would be "far below" the ANSI limits. Motorola maintained that the best way to control exposure to bystanders is to install mobile antennas in areas that are normally inaccessible. API felt that operator technique is the most important factor governing possible human absorption.

83. Motorola also discussed its studies of a window-mounted cellular antenna known as the "Avanti" antenna. Power is fed to this outside antenna through a capacitive coupling box mounted on the glass of the vehicle windshield or rear window. Motorola was concerned about the possibility of antenna mismatch that might cause injection of RF power into the vehicle via the cable feeding the coupling box. Under the worst conditions of mismatch, Motorola found that for a 3 W cellular unit the maximum E-field at 5 cm from the coaxial line feeding the box would be about 21 V/m. When the interior cable was properly installed no detectable E-field was present at 5 cm.

84. The highest field measured inside the vehicle was the equivalent of about 65 V/m for a 3 W cellular unit and was located about 2 inches from the coupling box. Motorola noted that this field decayed very rapidly away from the box down to as little as 6 V/m at about 5-6 inches distance. Outside the vehicle, the strongest E-field measured was the equivalent, for a 3 W system, of about 106 V/m at a point 2 inches from the coil at the base of the antenna. However, this value decayed rapidly to about 41 V/m at 4 inches and about 7-8 V/m one foot away from the front door of the car.

85. Motorola recommended that installation of this type of cellular antenna should be at the top and center of the windshield or rear window to minimize RF levels inside the vehicle, and a separation distance of 30-60 cm should be maintained between passengers or bystanders and areas with the highest RF levels.

86. Motorola also mentioned exposure from portable hand-held cellular telephones. According to Motorola, because of the low power levels of these devices (below 1 W) exposure of the user is about ten times below the ANSI limits for SAR. For 0.8 W of power, peak SAR was found to be 0.6 W/kg.

87. AT&T, in its comments, included a reprint of the Guy and Chou study mentioned above. The conclusions of this study state that "the mobile-antenna system can be operated safely well with all of the ANSI RFPG exposure guides in terms of both power density and maximum SAR for input powers of 3.5 W or less and within the guidelines of the ANSI exclusion clause for input powers up to 35 W."

88. GTE noted that Canada's 1979 RF exposure guidelines exclude mobile units operating with 50 W power or less, but require that any such units capable of exceeding the identified protection level at some distance must be clearly posted with the safe distance indicated. According to GTE, the USSR also excludes mobile radio from its protection guidelines.

Question (g): Would it be feasible for manufacturers of transmitting equipment to provide information to users on how best to ensure compliance with relevant RF safety standards? If so, should this be required of all manufacturers of such equipment, and should the Commission consider such information as part of our equipment authorization procedures?

89. Respondents had mixed reactions to the concept of manufacturers supplying such information. ARRL thought that equipment regulation was not appropriate and noted that the configuration of equipment at an antenna site would have a much greater effect on the potential for excessive exposure than the equipment itself. However, some respondents thought this idea had merit. For example, API stated that: "Manufacturers could develop sound advice concerning the installation and operation of their equipment and it would be proper for them to do so. It would similarly be in order for the Commission to require that this information be conveyed to each purchaser."

90. EPA expressed the view that manufacturers should be able to provide guidance to users on avoiding exposures to excessive fields. EPA felt that this was reasonable since manufacturers generally have information on system characteristics pertaining to field intensities under various possible modes of operation. GTE answered "yes" to both of the above questions. However, GTE thought that such information should only be necessary with regard to devices that could clearly cause excessive exposure under conditions of routine use (or misuse).

91. Motorola took the position that it is feasible for manufacturers of transmitting equipment to provide such information. Motorola has been providing similar information to users of its portable transmitters for several years. For example, in the case of 100 W mobile transmitters, a safety instruction label is attached to the push-to-talk switch, clearly instructing operators not to transmit if anyone is within 2 feet of the antenna. Furthermore, Motorola noted, exposure at this distance, as averaged over six minutes, would still be "well below" the ANSI guidelines. Safety labels are also shipped with all Motorola portable hand-held transmitters.

92. However, Motorola did not feel it necessary for the Commission to mandate that manufacturers supply such safety information. Nor did Motorola support the idea of requiring such information as part of the Commission's equipment authorization process. Rather, Motorola said, "there is sufficient motivation for manufacturers to take this action on their own, as it is essential [emphasis in original] for their short- and long-term economic well-being to take every reasonable action to provide for the safety of their customers."

93. In Motorola's view, the safety of mobile transmitters is best achieved by proper installation, and it is the responsibility of the manufacturer to include proper instructions on safe installation and procedures. Motorola felt that such actions by manufacturers would be more effective in reducing human exposure than information passed on to the user.

Question (h): How can access to land-mobile transmitters, particularly mobile units, best be controlled to minimize risk, if any, to users and to the public? Are there mounting or design modifications that can reduce ambient RF fields around vehicle-mounted antennas?

94. Many respondents covered this topic in their responses to earlier questions. However, GTE added that access should have to be controlled only if there is a high probability that power densities or field strengths would produce exposures in excess of the protection guides for significant periods of time. GTE maintained that, in occupational settings, the various employers in the telecommunications industry already have guidelines or procedures in place for controlling access.

95. Motorola reiterated its position that the only way to minimize exposure of the user is proper installation of the equipment on the vehicle. According to Motorola, exposure of passengers inside a metal-body vehicle is minimized by locating the antenna at the center of the roof and by routing the cable feeding the antenna so that the outer jacket is always touching metal parts of the vehicle body. In the 450-MHz and 800-MHz bands, Motorola said that locating the antenna in the center of a metal roof "ensures an instantaneous passenger exposure below ANSI RFPG . . ."

96. Motorola also noted that other antenna installations are acceptable. For low-power mobile transmitters (≤ 10 W) window-mounted antennas (discussed previously) and mounting on the lip or center of the trunk are acceptable and do not cause exposures above the ANSI protection guides. But NYNEX advised against the use of glass-mounted antennas, at least on rear-window defroster lines due to a potential increase in RF radiation. With higher power transmitters, e.g., 100 W; trunk mounting can, according to Motorola, result in instantaneous exposures above the ANSI limits at some locations of the rear passenger seat.

97. Fender and bumper mounting may, Motorola said, under some conditions, reduce exposure to vehicle occupants. However, such mounting configuration can increase the potential for excessive exposure of casual bystanders. In all cases, Motorola continued, whether the vehicle body is metal or fiberglass, when high power (e.g., 100 W) is used a spacing of about 60-90 cm should be maintained between antenna (and its ground, if any) and the vehicle occupants to keep passenger exposure below the ANSI guidelines.

98. NYNEX recommended either antenna installation on the roof, an elevated feed antenna on the rear deck of a vehicle, or a glass-mounted antenna. The latter two would raise the antenna's coil above the roofline of the vehicle.

99. Motorola restated its contention that operator training is important. Motorola urged that the operator of a stationary vehicle using a high power mobile transmitter, e.g. 100 W, should be instructed not to transmit if anyone is within 0.6 m (about 2 feet) of the antenna. Modifications in the antennas themselves are also possible, Motorola felt, but because of factors such as increased bulkiness and increased cost this option was less attractive as a control measure.

Question (i): We are proposing to include shipboard-satellite earth stations, authorized under Part 83, Subpart AA, of the FCC Rules and Regulations, in the category of facilities to which Section 1.1305(d) would apply. Is this inclusion justifiable, and is there, indeed, cause for concern over potential hazards from these transmitters? What about other types of shipboard RF sources such as radar and HF antennas? Please provide data and specific evidence to support your comments. [Responses to this question are discussed in the accompanying *Third Notice of Proposed Rule Making* (see footnote 1)]

Question (j): Are there transmitters or transmitting facilities that our proposal would exclude from NEPA processing that could, in fact, result in human exposure in excess of the ANSI guidelines during routine use? If so, please explain and include supportive data or evidence.

100. A few respondents already addressed this question in comments with respect to the previous question. High-powered radars appeared to be of greatest concern. API reiterated its concern over high-powered X-band radar found on most vessels. API noted that at least one major manufacturer of such systems (Decca-Racal) carries a hazard warning with each unit, advising of possible eye damage if directly exposed to a non-rotating antenna, or when looking into an energized waveguide.

101. The EPA mentioned FCC-licensed land-based radars as potentially causing close-in exposures in excess of the ANSI protection guides. The EPA discussed its concern over shipboard radar in its response to the previous question.

102. GTE's answer to this question was "yes," there are other RF sources that could cause exposures in excess of the guidelines. In this category GTE included "any station that can produce continuous wave ("CW") power at > 1kW power into vertically polarized antennas mounted close to or on a good ground plane.

FOOTNOTES

¹ *Third Notice of Proposed Rule Making*, GEN. Docket 79-144, Fed. Reg. (1987).

² *Report and Order*, 50 Fed. Reg. 11,151 (1985), 100 F.C.C. 2d 543 (1985), and *Further Notice of Proposed Rule Making*, 50 Fed. Reg. 10,814 (1985), 100 F.C.C. 2d 568 (1985). See also, *Memorandum Opinion and Order*, 50 Fed. Reg. 38,653 (1985), *Notice of Proposed Rule Making* 47 Fed. Reg. 8214, 10,871, and 27384 (1982), 89 F.C.C. 2d 214 (1982), and *Notice of Inquiry*, 44 Fed. Reg. 37,118 (1979), 72 F.C.C. 2d 482 (1979).

³ 47 C.F.R. 1.1301 *et seq.* See also, General Docket 79-163, "Amendment of Environmental Rules in Response to New Regulations Issued by the Council on Environmental Quality," *Report and Order*, 51 Fed. Reg. 14,999 (1986), and, specifically, Section 1.1307(b) which has replaced Section 1.1305(d) dealing with radiofrequency radiation. Our rules require the filing of an "Environmental Assessment" by an applicant if the proposed facility or operation may have significant environmental impact.

⁴ 42 U.S.C. 4321 *et seq.* (1976).

⁵ The standard identified by the Commission to serve as our guideline for safe exposure is the "American National Standard Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz (ANSI C95.1-1982) of the American National Standards Institute (ANSI), copyright 1982 by the Institute of Electrical and Electronics Engineers, Inc., New York, N.Y. 10017. Further information on this standard and compliance with it is given in OST Technical Bulletin No. 65, "Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radiofrequency Radiation, available from the National Technical Information Service (NTIS), (800) 336-4700, order number: PB 86-127081.

⁶ See *National Environmental Policy Act*, 42 U.S.C. Section 4321 *et seq.* (1976), at 4332(2)(c).

⁷ Council on Environmental Quality, Implementation of Procedural Provisions, Final Regulations, 43 Fed. Reg. 55,978 (1978), 40 C.F.R. Parts 1500-1508. The term "categorical exclusion" is defined by CEO in Section 1508.4. The CEO has oversight responsibilities with regard to implementation of NEPA by agencies of the Federal Government.

⁸ See Appendix C, Question (f).

⁹ However, we endorse Motorola's recommendation that, during periods of transmission, persons outside of the vehicle or near the antenna should be at least 60 cm (about two feet) away from the antenna, particularly if input power is in excess of 35 watts. We also recommend that manufacturers inform installers of antennas as to appropriate antenna mounting configurations that minimize exposure, both to vehicle occupants and to bystanders.

¹⁰ See footnote 1.

¹¹ Pursuant to the provisions of the Regulatory Flexibility Act of 1980, 5 U.S.C. Section 604.

APPENDIX G. Analysis and model of noise levels; prepared on 5/15/91 by Shelton P. Hobbs, Product Engineer and Douglas M. Bodrey, Vice President of Engineering, Crispaire, P.O. Box 400, Cordele, GA 31015 (912/273-3636).



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On Saturday May 11, 1991 between the hours of 8:00 and 10:00 a.m. an experimental test was performed to determine the noise levels of the Marvair model AVP 36 "CI" and the Marvair model AVP 12 "SLIMPAC" unitary wall mount air conditioners. Both units were mounted on a prefabricated steel frame with a corrugated paper wall to separate indoor and outdoor air movement. A sketch of the experimental apparatus is shown in figure 1 of this report. Figure 1 also shows the orientation at which sound level measurements were taken along with climatic and surrounding conditions.

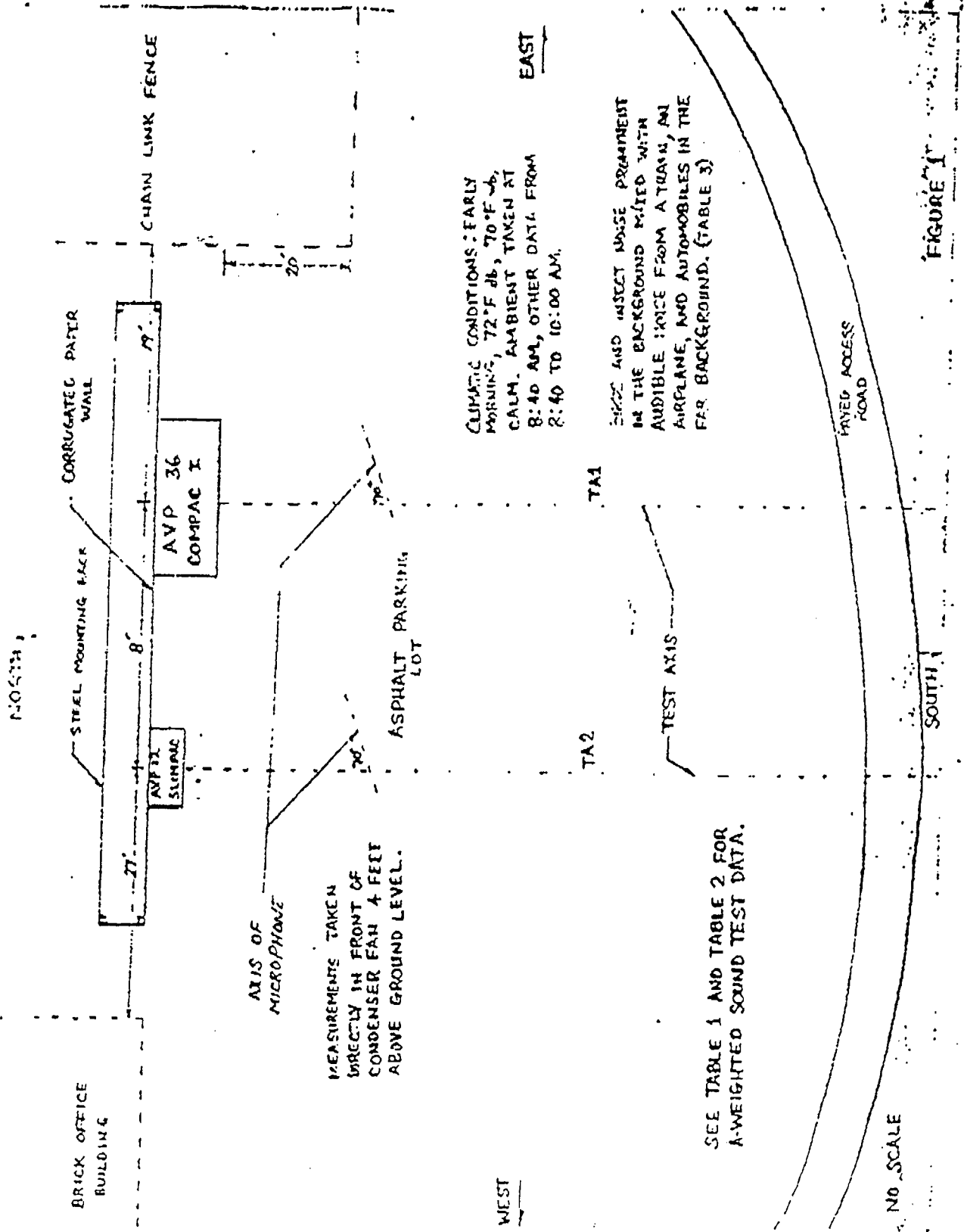
Noise level measurements were taken with a hand-held Simpson model 886 sound level meter. This meter is shown in figure 2.

Tabulations of sound level data for the model AVP 36 are located in table 1. Tabulations of sound level data for the model AVP12 are located in table 2. These measurements were taken at variable distances along the axes shown in figure 1. Each unit was in the maximum cooling mode when the noise level measurements were taken. Tables 1 and 2 also contain the corrected sound levels with respect to background noise. This corrected level was obtained from figure 4-4 using the average ambient noise levels from table 3.

Table 4-1 shows safe sound levels at specified duration times. The results of this test proved that the Marvair models AVP 36 "CI" and AVP 12 "SLIMPAC" are relatively quiet machines while in operation. These machines operate well below maximum permissible noise exposure limits.

Shelton P. Hobbs
 Shelton P. Hobbs
 Product Engineer

Douglas M. Bodrey
 Douglas M. Bodrey
 Vice President Engineering



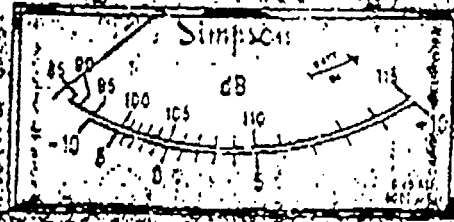
CLIMATIC CONDITIONS: EARLY MORNING, 72°F DB, 70°F WB, CALM. AMBIENT TAKEN AT 8:40 AM, OTHER DATA FROM 8:40 TO 10:00 AM.

NOISE AND INSECT NOISE PROMINENT IN THE BACKGROUND MIXED WITH AUDIBLE NOISE FROM A TRAIN, AN AIRPLANE, AND AUTOMOBILES IN THE FAR BACKGROUND. (TABLE 3)

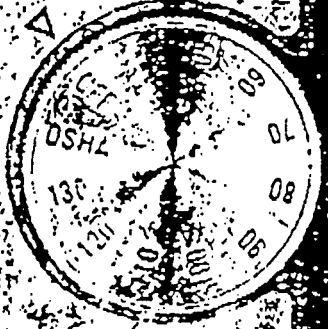
SEE TABLE 1 AND TABLE 2 FOR A-WEIGHTED SOUND TEST DATA.

NO SCALE

FIGURE 1



- A (OSHA)
- B
- C
- FAST
- SLOW



FAST SLOW

SOUND LEVEL METER
TYPE 2

TABLE 1
AVP 36 "CI"

A/C NOISE-LEVEL MEASUREMENT TABULATIONS.

TEST AXIS	DISTANCE FROM UNIT "FT"	SOUND LEVEL dB(A)
TA1	20	62
"	30	58
"	40	56
"	50	55
"	60	53
"	70	53
"	80	52
"	90	52
"	100	50
"	200	49

DISTANCE FROM UNIT "FT"	CORRECTED SOUND LEVEL dB(A)
20	62
30	58
40	56
50	54
60	52
70	52
80	50
90	50
100	46
200	43

TABLE 2
AVP 12 "SLIMPAC"

A/C NOISE-LEVEL MEASUREMENT TABULATIONS.

TEST AXIS	DISTANCE FROM UNIT "FT"	SOUND LEVEL dB(A)
TA 2	10	63
"	20	60
"	30	56
"	40	53
"	50	49
"	100	48
"	200	45

DISTANCE FROM UNIT "FT"	CORRECTED SOUND LEVEL dB(A)
10	63
20	60
30	56
40	53
50	48
100	46
200	39

TABLE 3
AMBIENT NOISE LEVELS

	TEST AXIS	DISTANCE FROM UNIT "FT"	AMBIENT SOUND LEVEL dB(A)
[AVP 36]	TA 1	20	48
	"	40	48
	"	60	46
	"	80	49
	"	100	47
	"	200	49
[AVP 12]	TA 2	20	44
	"	40	45
	"	60	44
	"	80	46
	"	100	44
	"	200	43

TA1 AVG. AMB. 48 dB(A)

TA2 AVG. AMB. 44 dB(A)

Table 4-1. Permissible Noise
Exposure Limits*

Duration per day in hours	Sound level, dB(A) SLOW response
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or Less	115

- When daily noise exposures are composed of two or more periods of noise exposure at different levels, one must consider their combined effect, rather than the individual effect of each. If the sum of the following fractions: $C_1/T_1 + C_2/T_2 \dots C_n/T_n$ exceeds unity, then consider the mixed exposure to exceed the designated limit value. C_n level, and T_n indicates the total time of exposure permitted at that level. For compliance, exposure to impulsive or impact noise must not exceed 140 dB(A) peak sound level.

Operation

4.11 BACKGROUND NOISE

4.11.1 Ideally, any sound source being measured should be isolated from effects due to extraneous or background noise. If the background noise is 10dB or more below the sound source level desired, the effect from the background noise can be considered negligible. For instances where the ratio is less than 10dB, an approximation can be made using Figure 4-4 and measurements of the background noise alone and the sound source with the background noise. Simply take the difference between these measurements and locate this difference value on the abscissa of Figure 4-4. Move in a vertical direction from this point to the intersect of the curve and thence horizontally to the corresponding ordinate point. This ordinate point indicates a value to be subtracted from the total or sound source with background noise measurement. The difference obtained represents the sound source level. It should be noted that a difference of 3dB or less between sound source and background noise will provide only an indication of this sound source level, not an accurate measurement.

6-13

Operation

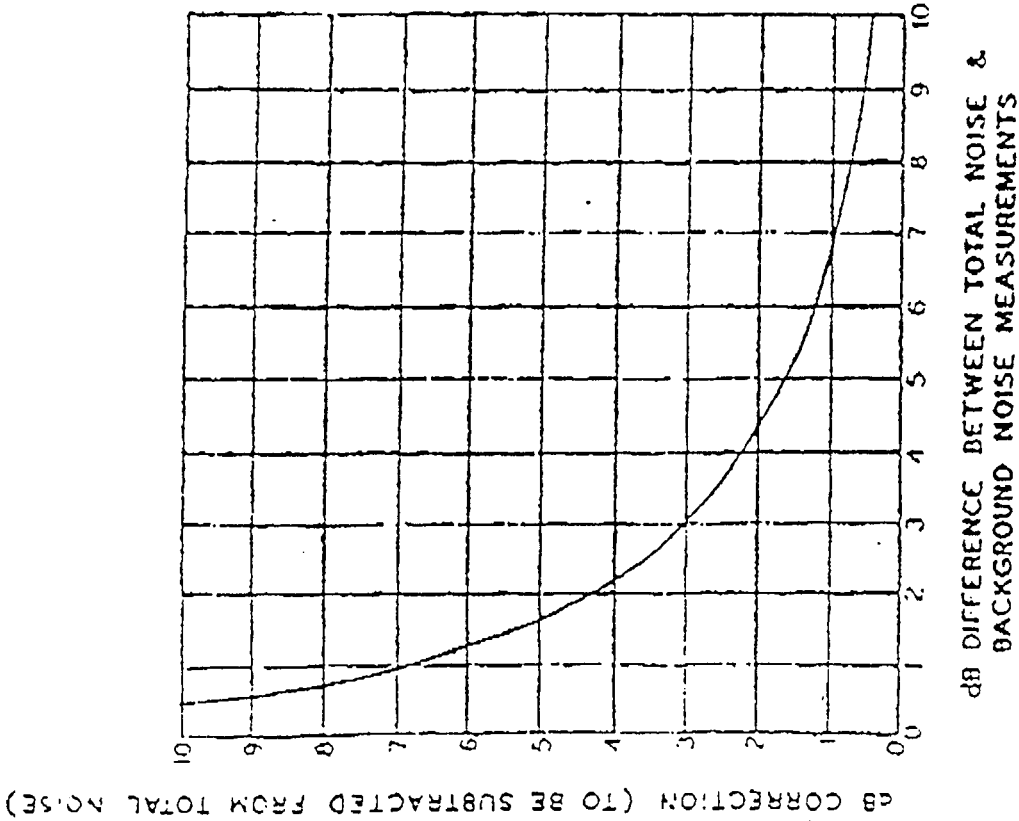


Figure 4-4. Background Noise Correction

6-14

APPENDIX H. Engineering analysis of 260' tower's fall zones;
prepared by Myron C. Noble, P.E., President,
PiRod, Inc., 1200 N. Oak Road, P.O. Box 128,
Plymouth, IN 46563-0128 (219/936-4221) (dated
5/9/91).



PIROD INC.

May 9, 1991

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FAX (219) 936-6796

Mr. James C. Egyud
GURMAN, KURTIS, BLASK & FREEDMAN
1400 16th St., N.W. Suite 500
Washington D.C. 20036

Dear Mr. Egyud:

Thank you for your inquiry relating to tower design practices and predicted type of failure, in particular our Model #36 x 260' located in Torrington CT., (Eng. File A-107,657).

The national design code (EIA Standard RS-222-D) requires that the factor of safety of guy wires be greater than the factor of safety in the tower structure itself. For towers 700' or less, the minimum factor of safety on wires is 2.0, while the minimum factor of safety on tower members is 1.25.

The purpose of this disparity is to insure that failure of the structure is predicted before failure of the wires. Structural failure would therefore be predicted to result in collapse of the tower like a "carpenter's rule" in the general area of the base of the tower.

I have reviewed the plot plan attached and the positions of three closely positioned guy towers. It is my professional opinion that, in the event of a weather induced failure, all materials would fall safely within the property shown.

Should you have any questions, please do not hesitate to contact us.

Sincerely,

Myron C. Noble, P.E.
President

MCN/lsc

APPENDIX I.

Engineering analysis of 260' tower's structure and capability to be modified; prepared by Kenneth E. Blessing, Jr., V.P., PiRod, Inc., 1200 N. Oak Road, P.O. Box 128, Plymouth, IN 46563-0128 (219/936-4221) (dated 5/9/91).



PIROD INC.

May 9, 1991

1200 N. OAK RD.
P.O. BOX 128
PLYMOUTH, INDIANA 46563-0128
(219) 936-4221
FAX (219) 936-6796

Mr. James C. Egyud
GURMAN, KURTIS, BLASK & FREEDMAN
1400 16th St., N.W. Suite 500
Washington DC. 20036

RE: PiRod Tower Model #36 x 260'
PiRod Eng. File A-107,657
Gerbi Communication
1210 Highland Ave., Torrington CT. 06790

Dear Mr. Egyud:

1. It is my understanding that Litchfield County Cellular Inc., ("LCC") proposes to utilize the above-referenced tower, designed by PiRod Inc., and owned by Gerbi Communication, to mount antennas and transmission lines for its cellular service base station in the Torrington CT., area. It is also my understanding that LCC proposes to mount on this tower, in particular, six (6) PD-10017 cellular antennas, or those with similar or lesser loading characteristics, each with 1-5/8" transmission line, at the 205' above-ground location on the tower. It is also my understanding that LCC proposes to mount on this tower three (3) or fewer solid microwave dishes with radomes of six (6) feet in diameter, or those with similar or lesser loading characteristics, each with 7/8" transmission line at or below the 100' above-ground location on the tower. Finally, it is my understanding that tower space is currently available for mounting such items at these proposed tower locations.

2. It is my understanding that the tower in question currently supports (or is proposed to support in the future) the antennas and associated equipment listed on the attached page, at the heights also listed on the attached page.

May 9, 1991
Page Two of Two

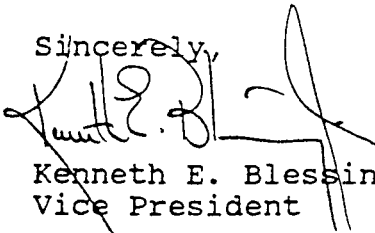
3. As referenced in the engineering drawings supplied by PiRod for this structure, PiRod engineering file #A-107,657, the tower has been designed and constructed to accommodate the loading and dimensions of the following equipment:

- Six - PD10017 antennas at 215' above-ground with 1-5/8" transmission lines
- Three - 6' solid dishes with radomes at 100' above-ground

The tower was also designed to accommodate other such appurtenances and lines as listed on page one of three, PiRod drawing #114,905-B.

It is my professional opinion that, in light of the tower design specifications given in the above paragraph (three), and in light of the availability of suitable space on the tower as specified in the design parameters of paragraph three, and in light of the items currently mounted on the tower as mentioned in paragraph two, the tower structure will be fully capable of supporting such items as listed in paragraph one, as proposed for use by LCC.

Sincerely,



Kenneth E. Blessing, Jr.
Vice President

lsc



PIROD INC.

P.O. Box 128

• Plymouth, IN 46563

• (219) 936-4221

Gerbi Communication
260' PiRod Tower Transmission Equipment

<u>Frequency (MHz)</u>	<u>Antenna Model</u>	<u>Transmission Line</u>	<u>Tower Location</u>
*Motorola (Receive) 820.2875, 819.2875, 818.2875, 817.2875, 816.2875	Sinclair SRL 480*1 (14')	7/8" (1 run) 1/2" (1 run)	260'
TV Lab (Receive) 468.275	Celwave PD 455-7	1 1/4" (2 runs)	260'
TV Lab (Transmit) 463.275	Celwave PD 458-2	1 1/4" (1 run)	220'
Page America 931.43125 (Receive)	Celwave PD-10017	1 5/8" (1 run)	260'
Page America 931.6125 (Transmit)	Celwave PD-1108	1 1/4" (1 run)	220'
FM Broadcast 97.3 (Transmit)	4-bay circular polarization	1 5/8" (1 run)	120'

* Uses pre-amp weighing 55 lbs. at 260' level



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

136 Main Street, Suite 401
New Britain, Connecticut 06051
Phone: 827-7682

July 18, 1991

Peter J. McDonald
Vice President
Litchfield County Cellular, Inc.
777 East Main Street
Torrington, CT 06790

RE: Litchfield County Cellular, Inc., notice of intent to modify an existing non-facility telecommunications tower and associated equipment in the City of Torrington, Connecticut.

Dear Mr. McDonald:

At a public meeting held on July 16, 1991, the Connecticut Siting Council (Council) ruled that this facility would not cause a significant change or alteration in the physical and environmental characteristics of the site for placement of six cellular telecommunication antennas at the 205 foot level of the existing non-facility telecommunications tower and acknowledged your notice of intent to modify this existing non-facility telecommunications tower and associated equipment located at 1210 Highland Avenue, Torrington, Connecticut, pursuant to Section 16-50j-73 of the Regulations of State Agencies (RSA).

The three or fewer microwave dishes that were to be placed on the non-facility telecommunications tower were not approved as an exempt modification by the Council because this equipment was considered speculative given that the microwave paths associated with the dishes have not yet been established. The Council would reconsider these microwave dishes if and when final design and need for this equipment has been determined.

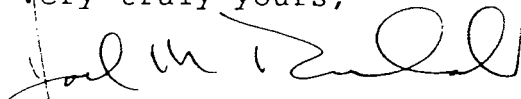
The proposed modifications are to be implemented as specified in your notice dated June 21, 1991. As proposed, the modifications are in compliance with the exception criteria specified in RSA 16-50j-72 as changes to an existing non-facility site that do not increase the tower height, extend

the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels or more, add radio frequency sending or receiving capability which increases the total radio frequency electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to Section 22a-162 of the Connecticut General Statutes, and has received all municipal zoning approvals and building permits.

The Council is pleased to note that the shared use of an existing tower serves the Council's long-term goal of protecting the public interest by avoiding proliferation of additional tower structures.

Please notify the Council upon completion of construction.

Very truly yours,



Joel M. Rinebold
Executive Director

JMR/cp

cc: Timothy S. Hollister, Esq.
Andrew N. Davis, Esq.

5443E

DO 156

May 6, 1994

RECEIVED
MAY - 6 1994

VIA HAND DELIVERY

**CONNECTICUT
SITING COUNCIL**

The Honorable Mortimer A. Gelston, Chairman
Members of the Siting Council
Mr. Joel M. Rinebold, Executive Director
The Connecticut Siting Council
136 Main Street, Suite 401
New Britain, Connecticut 06051-4225

Re: Litchfield County Cellular, Inc. -- Motion for Transfer
of Certificate and Exempt Modification Approval

Dear Chairman Gelston, Mr. Rinebold and Council Members:

Litchfield County Cellular, Inc. ("LCCI") respectfully submits the above-captioned Motion for Council action. This Motion is submitted pursuant to C.G.S. § 16-50k(b).

LCCI appreciates the Council's action on the above-captioned Motion and will be available at the Council's meeting to address any questions concerning this submission.

Should you have any questions, please do not hesitate to contact me.

Sincerely,

LITCHFIELD COUNTY CELLULAR, INC.

By: 

Andrew N. Davis
Brown, Rudnick, Freed & Gesmer
CityPlace I, 185 Asylum Street
Hartford, CT 06103-3402
(203) 525-8008
Its Attorneys

AND/sa
Enclosures
cc: Terry Armant, CellularOne
Solon Kandel, Esq.

DELPHI : WP3 : [DAVISA]LCCILIN.AA4;6

A Partnership of
Professional Corporations

CITYPLACE I
185 ASYLUM STREET
HARTFORD, CONNECTICUT 06103-3402
203-525-8008
FAX 203-525-8212

Boston / Providence

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

MOTION FOR TRANSFER OF
CERTIFICATE AND EXEMPT MODIFICATION APPROVAL

Pursuant to Connecticut General Statutes ("C.G.S.") § 16-50k(b), Litchfield County Cellular, Inc. ("LCCI") hereby moves the Connecticut Siting Council (the "Council") for approval to transfer its Certificate of Environmental Compatibility and Public Need ("Certificate") for Plymouth, Connecticut (Docket 156) and its Modification of Exempt Facility Approval ("Exempt Modification Approval") for Torrington, Connecticut (approved July 16, 1991) for the Litchfield Rural Service Area ("RSA"). Through a series of transitional steps, as outlined in the Description of Transaction and Public Interest Statement (the "Statement"), FCC Form 490, Exhibit 2, December, 1993 of LCCI attached hereto as Exhibit A, LCCI will transfer its Certificate and Exempt Modification Approval to Litchfield Acquisition Corporation ("LAC") as a component of the acquisition that will be completed on or about the end of May, 1994. LAC is a Delaware corporation qualified to do business in Connecticut (d/b/a CellularOne Connecticut). The reasons that these transactions have been structured in the above-referenced manner are set forth in the Statement attached hereto as Exhibit A.

LCCI submits to the Council that the proposed transfers are in the public interest because they will result in the consolidation of the New York City regional system operated by LAC's affiliates and will provide for the continued operation of the Connecticut 1 System by an experienced cellular system operator.

LAC, a wholly-owned direct subsidiary of LIN Broadcasting Corporation ("LIN"), which was formed by LIN specifically for the purposes of acquiring Connecticut RSA 1, does not currently hold any Federal Communication Commission ("FCC") licenses. However, through other subsidiaries, corporations, and partnerships, LIN owns a 93.1% equity and voting interest in Cellular Telephone Company, the licensee of non-wireline station KNKA310 serving the nearby New York Metropolitan Service Area ("MSA"). LIN also controls three other major-market cellular systems and owns a 49.99% equity interest in the Philadelphia non-wireline licensee. Moreover, LIN and LAC are indirectly controlled by the largest cellular service provider in the nation, McCaw Cellular Communications, Inc., which controls or shares control in a non-wireline cellular licensee in more than 100 markets.

LAC's acquisition of Connecticut RSA 1 will permit LIN to provide integrated cellular service to many people traveling in and out of Litchfield County from other service areas and to

many Litchfield residents who regularly work in the New York MSA and commute between the market served by Connecticut RSA 1 and the New York MSA. The proposed acquisition, therefore, will advance the FCC's stated goal of creating a seamless cellular network to serve the entire nation. The grant of the instant Motion thus would serve the public interest, convenience and necessity.

LAC will employ similarly qualified personnel as LCCI to maintain the facilities, use similar maintenance and repair procedures, and provide the same service to end-users. Attached to this Motion is a letter signed by LAC's General Manager acknowledging LAC's consent to comply with all of the terms, limitations and conditions contained in the Certificate and Exempt Modification Approval.

LCCI respectfully requests that the Council grant its Motion for Transfer of the Certificate and Exempt Modification Approval. In conformance with C.G.S. § 16-50k(b), LCCI affirmatively states that such transfer was not contemplated at or prior to the Council's granting of the Certificate in Docket 156 for Plymouth or its Exempt Modification Approval for Torrington. The Council's approval to transfer the Certificate and Exempt Modification Approval would, of course, be conditioned upon the ultimate transaction being closed. In order to assist the Council in approving the transfer, LCCI has

attached as **Exhibit B** the two-step FCC Consents to Assignment of Common Carrier Radio Station Construction Permit or License issued by the FCC on March 10, 1994, for the assignment to LAC of the FCC license for the cellular radio system on Frequency Block A in the Connecticut 1 - Litchfield RSA.

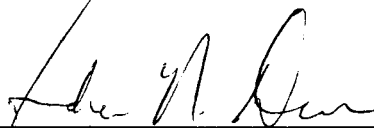
LITCHFIELD COUNTY CELLULAR, INC.

By: 

Andrew N. Davis
John J. Russotto
BROWN, RUDNICK, FREED
& GESMER, P.C.
CityPlace I, 185 Asylum Street
Hartford, Connecticut 06103-3402
(203) 525-8008
Its Counsel

ARUBA::WPO:[RUSSO?TOJ]LCCI.AC8;34

An original and twenty (20) copies of the foregoing have been hand-delivered to Mortimer A. Gelston, Chairman, Connecticut Siting Council, 136 Main Street, Suite 401, New Britain, CT 06051-4225 on May 6, 1994.



Andrew N. Davis
Commissioner of the Superior
Court

ARUBA: :WPO: [RUSSOTTOJ]LCCI.AC8;35

EXHIBIT A

Description of Transaction
and Public Interest Statement

By this and other concurrently filed applications, Litchfield County Cellular, Inc. ("Litchfield"), Contel Cellular of Kentucky B, Inc. ("Contel-Kentucky"), Oregon RSA No. 5 Limited Partnership ("Contel-Oregon") and Litchfield Acquisition Corporation ("LAC") seek Commission consent to the assignment of the licenses for the cellular radio systems on Frequency Block B in the Oregon 5 - Coos RSA and the Kentucky 11 - Clay RSA and to a two-step assignment of the license for the cellular radio system on Frequency Block A in the Connecticut 1 - Litchfield RSA. The proposed transactions will ultimately result in Litchfield holding the licenses for the Oregon 5 and Kentucky 11 systems and LAC holding the license for the Connecticut 1 system. Attached hereto is a chart depicting the proposed transactions.

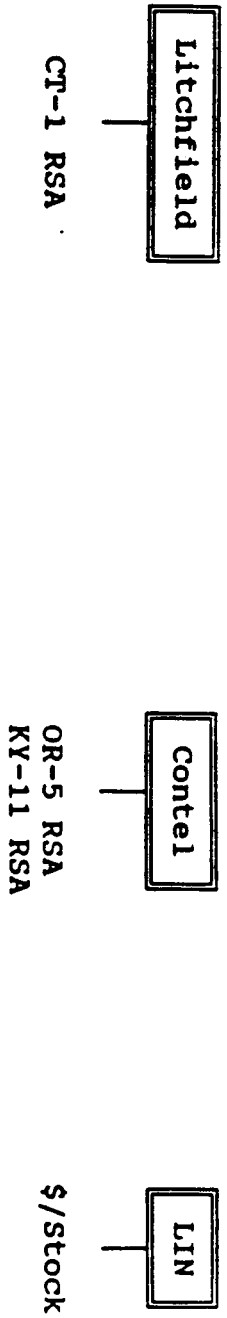
The first step of the proposed transaction involves three simultaneous assignments: (1) Litchfield will assign the license for the Connecticut 1 system to Contel-Kentucky and Contel-Oregon as tenants in common; (2) Contel-Kentucky will assign the license for the Kentucky 11 system to Litchfield; and (3) Contel-Oregon will assign the license for the Oregon 5 system and its associated microwave stations to Litchfield. In the second step of the proposed transaction, Contel-Kentucky and Contel-Oregon as tenants in common will assign the license for the Connecticut 1 system to LAC.

For tax planning and other business purposes, the transactions involving these systems have been structured so that each of the first-step assignments must be completed before the second-step assignment can occur, and the second-step assignment must be consummated immediately after the completion of the first step. Thus, the parties have concurrently filed the Connecticut 1 assignment applications as "step one" and "step two" and the applications for all of the assignments necessarily must be concurrently processed.

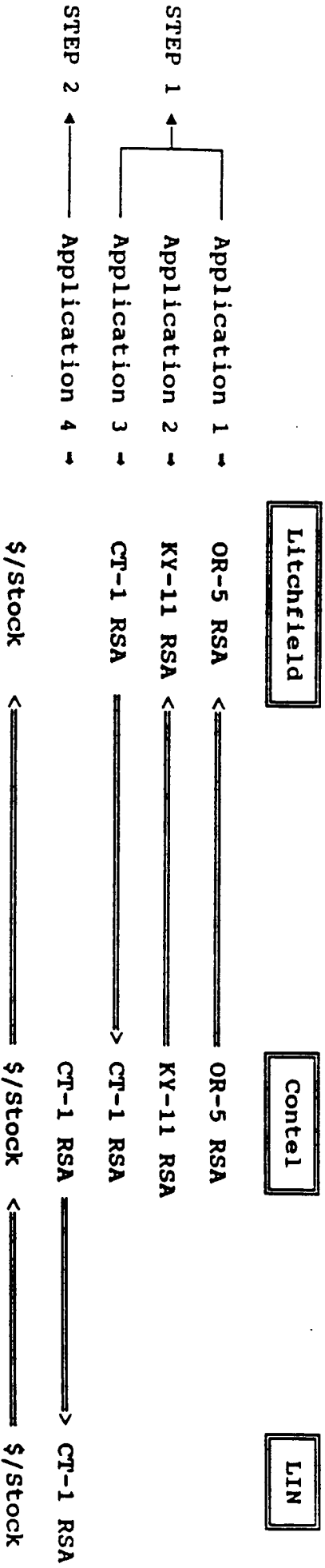
The parties to this application submit that the proposed transactions are in the public interest because they will result in the consolidation of the New York city regional system operated by LAC's affiliates and will provide for the continued operation of the Oregon 5 and Kentucky 11 systems by an experienced cellular system operator.^{1/} Each of the parties to the proposed transaction is fully qualified to hold an FCC authorization and, in fact, currently holds FCC authorizations. The parties, therefore, respectfully request grant of the concurrently filed applications.

^{1/} Section 22.40 of the Commission's Rules is not applicable to this transaction because each of the Connecticut 1, Kentucky 11 and Oregon 5 systems has been operational for more than one year.

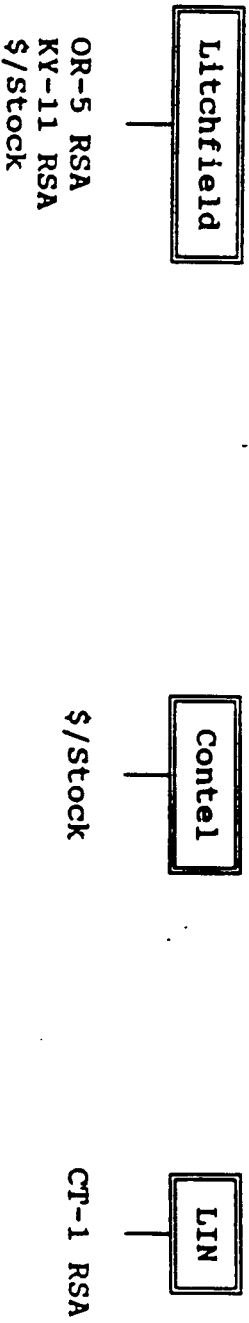
BEFORE

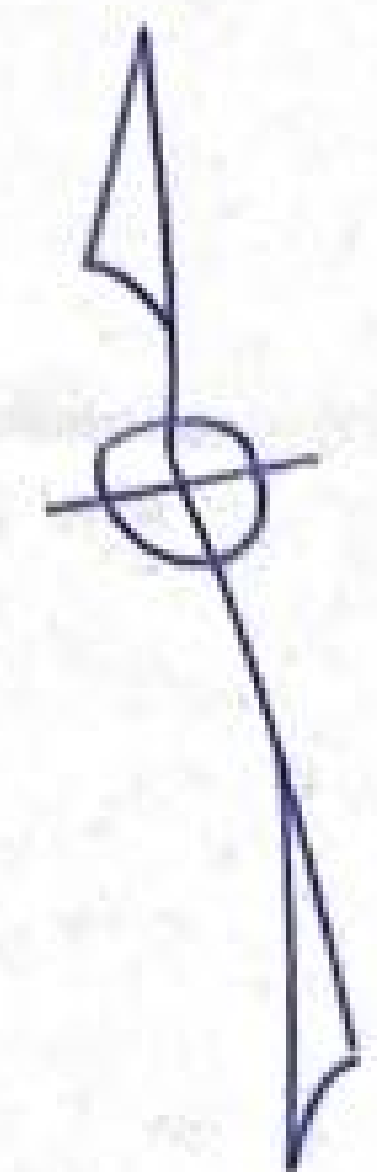


PROPOSED TRANSACTIONS



AFTER

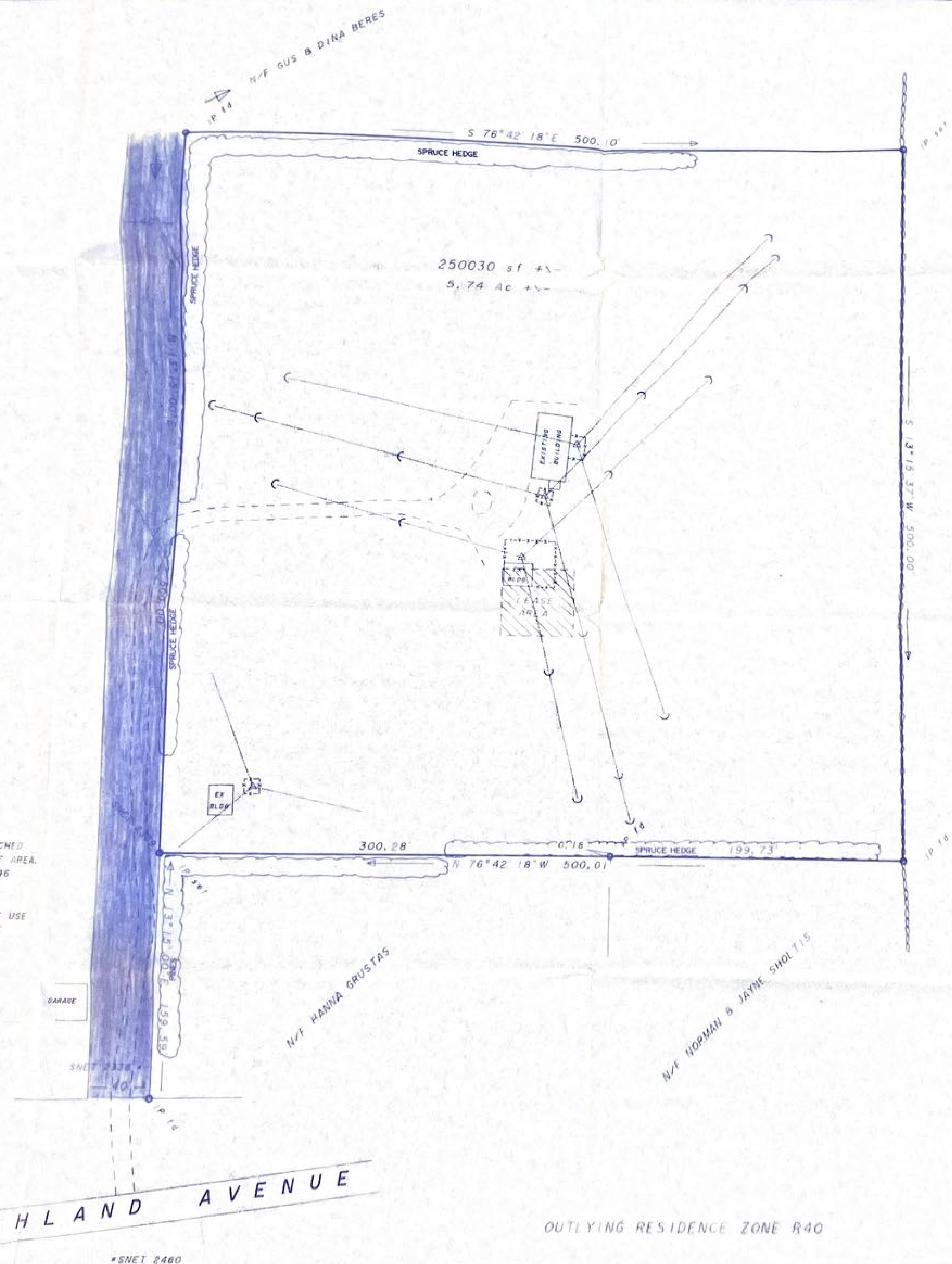




- LEGEND:**
- stone wall
 - existing tower
 - property line
 - iron pipe or pin
 - guy anchor
 - guy wire
 - fence

LEASE AREAS
 LAUREL CABLEVISION, INC. HAS A LEASE OVER CROSS-HATCHED AREA, WITH THE RIGHT TO INSTALL GUY WIRES OUTSIDE OF AREA, WITH A RIGHT OF WAY OVER SHADED AREA. VOL 285 PG. 246

EDMUND WILLIAM WALLER ENTERPRISES HAS A LEASE TO THE USE OF A TOWER AND SMALL BUILDING TO OPERATE A BROADCAST TRANSMITTER AND ERECT AN ANTENNA. VOL. 435 PG. 79



HIGHLAND AVENUE

*SNET 2460

OUTLYING RESIDENCE ZONE R40



MAP REFERENCES:

1. "PLAN SHOWING TOWER LOCATION OF THE LITCHFIELD COUNTY RADIO CORP. ON HIGHLAND AVENUE, TORRINGTON, CT." by W. A. WILLISTON dated 9/47
2. "MAP OF PROPERTY TO BE CONVEYED TO ANTHONY J. GRUSTAS BY ANTHONY GRUSTAS TORRINGTON, CONNECTICUT" by G. A. HANSON dated October 1964
3. "PROPERTY OF WILLIAM J. McELHONE, TOWN OF TORRINGTON, COUNTY OF LITCHFIELD, STATE OF CONNECTICUT" by THOMAS F. SULLIVAN, dated May 1969

SURVEYOR'S NOTE:

THIS PARCEL HAS A 40' RIGHT OF WAY OVER LAND OF GUS A. AND DINA C. BERES SHOWN AS SHADED AREA.



NO CERTIFICATION IS EXPRESSED OR IMPLIED ON ORIGINAL OR ANY COPY LIST OF THIS MAP UNLESS IT BEARS THE IMPRESS OR TYPICAL OF THE SURVEYOR WHOSE REGISTRATION NUMBER AND SIGNATURE APPEAR HEREON. I HEREBY DECLARE: 2

HUGO & REGINA GERBI

THAT THIS SURVEY WAS ACTUALLY MADE UPON THE GROUND AND THAT IT AND THE BOUNDARY AND MEASUREMENTS SHOWN HEREON ARE CORRECT WITHIN THE STANDARDS OF A CLASS A-2 SURVEY AS SET FORTH IN THE RECOMBINED STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT AS THEREIN AND ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 13, 1984

[Signature]
 JOHN V. DICARA L.S. # 4201

DICARA LAND SURVEYING SERVICES			
WINSTED, CONNECTICUT			
BOUNDARY SURVEY			
PREPARED FOR			
HUGO S. & REGINA A. GERBI			
OFF HIGHLAND AVENUE		TORRINGTON, CT.	
DATE	BY	DATE	BY
3-25-81	JV	81014	
SCALE	BY	DATE	BY
1" = 40'		8 108	

NOTES

- PERIMETER OF PARCEL PLANTED WITH 15-20' CONIFERS.
- SIGHT DISTANCES ON HIGHLAND AVE. FROM INTERSECTING ACCESS DRIVE: EAST = 200+ FEET; WEST = 225 FEET.
- NO ADDITIONAL EXTERIOR LIGHTING PROPOSED OTHER THAN A SINGLE LIGHT OVER DOORWAY ON STRUCTURE.
- NO SANITARY SEWER, WATER OR STORM DRAINAGE PROPOSED.
- 3" PVC CONDUIT WITH PULL CORD AVAILABLE TO EXISTING STRUCTURE AND 200' TOWER TO ACCEPT ELECTRICAL POWER LINE TO SERVE PROPOSED BUILDING.

ZONING INFORMATION

SECTION VI (m)

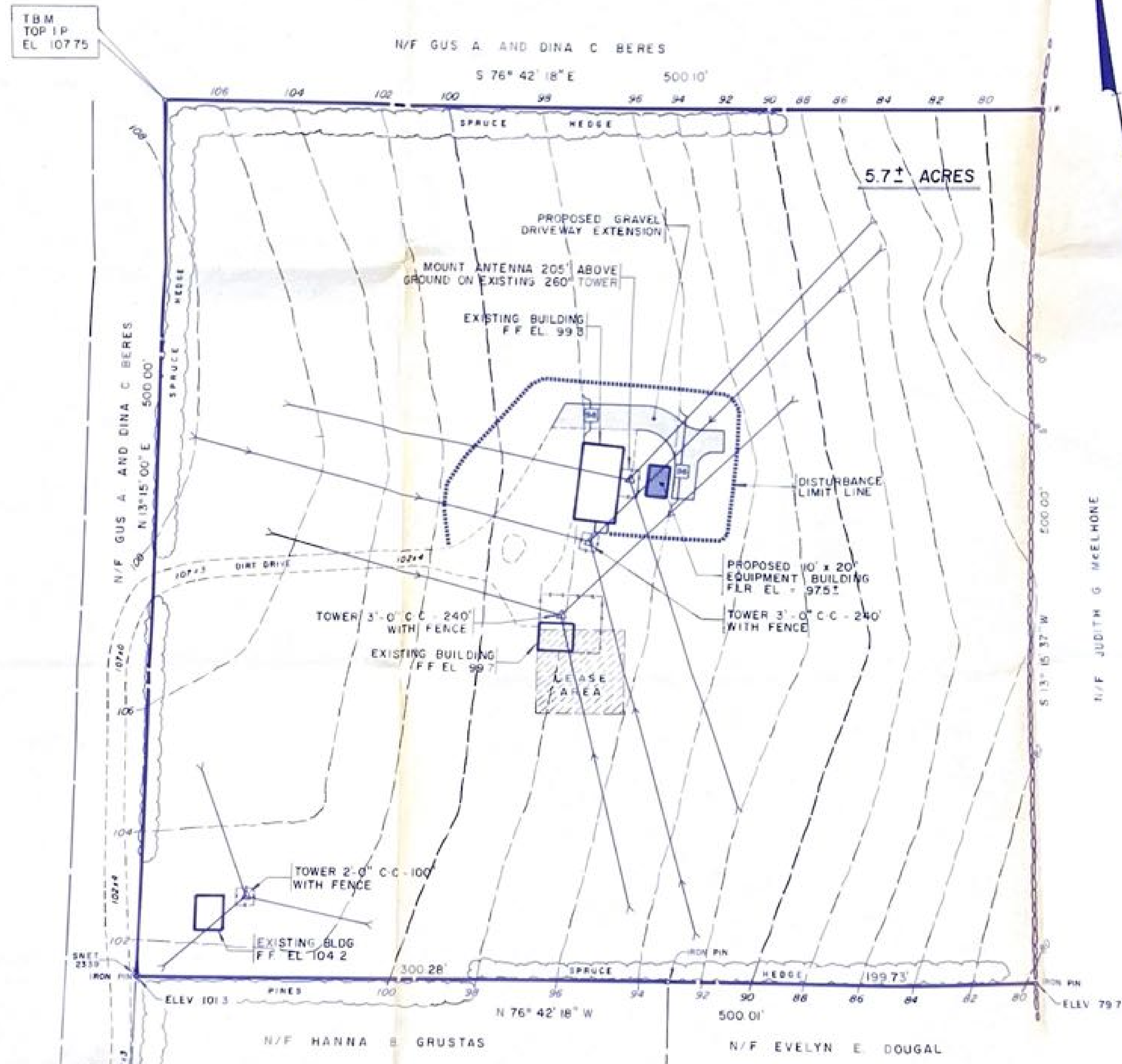
ZONE IN WHICH PROPERTY LIES:	R-40
SITE AREA IN SQUARE FEET OR ACRES:	5.7 ACRES
GROSS FLOOR AREA	200 SQ. FT.
BUILDING COVERAGE (EXISTING)	1,866 SQ. FT.
BUILDING COVERAGE (PROPOSED)	2,068 SQ. FT.
BUILDING HEIGHT IN FEET & NUMBER OF STORIES:	12', 1 STORY
NUMBER OF PARKING SPACES REQUIRED:	NO REQUIRED NUMBER SPECIFIED BY ZONING REGULATIONS
NUMBER OF PARKING SPACES PROVIDED	ONE
PROPOSED DENSITY:	NOT APPLICABLE

MAP REFERENCES

- CONTOURS TAKEN FROM "PLAN SHOWING TOWER LOCATION OF THE LITCHFIELD COUNTY RADIO CORP. ON HIGHLAND AVENUE, TORRINGTON, CT." DATED 9/47 BY W.A. WILLISTON, C.E.
- PROPERTY LINE INFORMATION, LEASE AREAS, ABUTTING OWNERS, AND LOCATIONS OF EXISTING TOWERS, FENCES, BUILDINGS, HEDGES, DRIVEWAY, ETC. TAKEN FROM "BOUNDARY SURVEY PREPARED FOR HUGO S. & REGINA A. GERBI OFF HIGHLAND AVENUE, TORRINGTON, CT." DATED 3/25/1991, PREPARED BY DICARA LAND SURVEYING SERVICES.

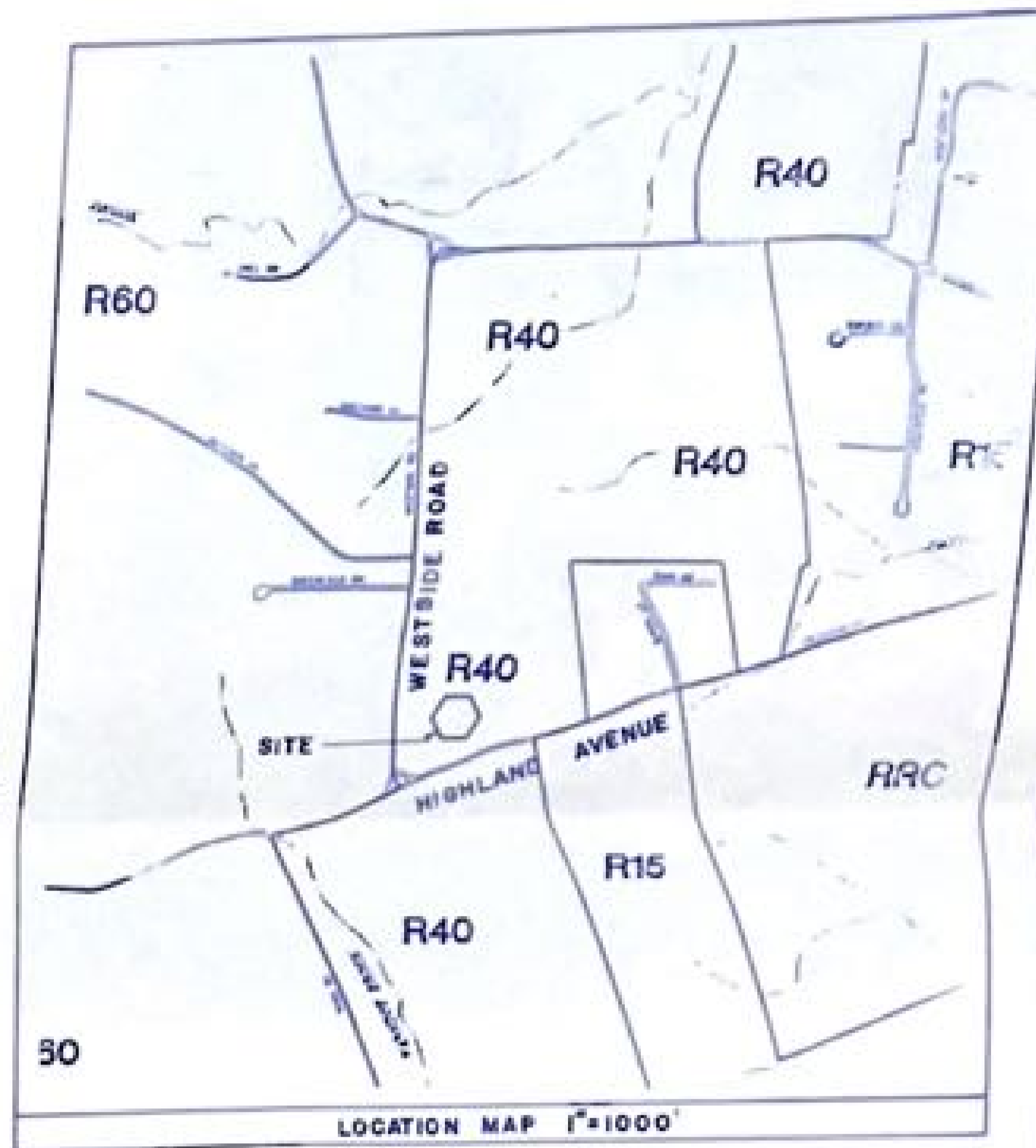
LEGEND

PROPERTY LINE	— — — — —
STONE WALL	— — — — —
EXISTING CONTOUR	— 100 —
EXISTING TOWER	△
FENCE	— — — — —
PROPOSED CONTOUR	— 100 —
EXISTING SPOT ELEVATION	100.40
BUY ANCHOR LOCATIONS	— — — — —



HIGHLAND AVENUE

PLAN
SCALE: 1" = 40'



REVISED 4-24-91 UPDATE SURVEY

Land-Tech Consultants, Inc. <small>ENGINEERS - PLANNERS - ENVIRONMENTAL SCIENTISTS</small>	PREPARED FOR: LITCHFIELD COUNTY CELLULAR, INC.	PROJECT LOCATION: 1210 HIGHLAND AVE. TORRINGTON, CT
	TITLE: PROPOSED TRANSMISSION EQUIPMENT BUILDING	
PLAN HOUSE CORNER SUITE 200 77 MAIN STREET NORTH SOUTHURY CONNECTICUT 06488 (203) 264-8300	DATE: 3-6-91 SCALE: SHOWN	DWN BY MP CKD BY MB DWG. NO. A00591-02 SHEET 1 OF 1

