

Comprehensive Technical Exhibit
Application for Construction Permit
K292FZ - Mount Vernon, Iowa
KZIA, Inc.
September, 2011

Application for Construction Permit

The following engineering statement and attached exhibits have been prepared for **KZIA, Inc.** ("KZIA"), licensee of FM translator station K292FZ at Mount Vernon, Iowa, and are in support of their application for construction permit to modify that facility.¹ Under this application, KZIA seeks to relocate the authorized translator as well as change the primary station feeding the translator. In addition, KZIA also seeks to change the community of license from Mount Vernon, Iowa to Iowa City, Iowa.

Under this application it is proposed that KZIA(FM) at Cedar Rapids, Iowa (Facility ID: 35556) become the primary station. As demonstrated in Exhibit E-1, the proposed 60 dBu service contour would be wholly contained within the KZIA(FM) 60 dBu service contour. KZIA is the licensee of KZIA(FM).

The proposed change in the technical facilities would constitute a minor change to the facility. No change in the channel of operation is proposed. Exhibit E-2 depicts the licensed 60 dBu service contour for K292FZ along with the proposed 60 dBu service contour. As this exhibit demonstrates, these contours would overlap, illustrating that the proposed changes to the facility are minor in nature.

The proposed facility would comply with the interference provisions of Section 74.1204 of the Commission's Rules. The television channel six interference provisions of Section 74.1205 are not applicable due to the channel of operation. Compliance with the interference provisions of the rules is demonstrated through contour, Longley-Rice, and tabular methodologies.

¹ The Facility ID for K292FZ at Mount Vernon, Iowa is 153604.

Exhibit E-3 is a tabular allocation study for the proposed facility. This study demonstrates that there would be no normally prohibited outgoing contour overlap with any facility except K295AC at Iowa City, Iowa.² Although there would be prohibited contour overlap with that facility, alternate methods of studying the situation demonstrate that zero population would be affected by the proposed facility. The allocation study tabulated in Exhibit E-3 is depicted based on contours in Exhibit E-4.

In Exhibits E-5 and E-6, the potential of interference from the proposed facility to K295AC is considered by the Longley-Rice propagation method. These two exhibits demonstrate that there are no areas of interference predicted to occur by this propagation model. To demonstrate further that only unpopulated areas and structures could potentially receive interference, the situation was studied under a different method.

This second method specifically utilizes the vertical radiation pattern and the Commission's contour methodology. The map in Exhibit E-7 illustrates the transmitter site for K295AC as well as the proposed transmitter site for K292FZ and a family of contours for K295AC. As this family of contours illustrates, the 67-70 dBu F(50,50) service contours for K295AC lie in the vicinity of the proposed K292FZ transmitter site.

In order to consider a worst-case scenario for the potential interference under this methodology, it will be assumed that a field strength of 67 dBu exists in relevant areas. Under the Commission's definition of interference, areas where the field strength from the proposed translator would be in excess of 40 dB above the field strength from K295AC would potentially receive

² The Facility ID for K295AC at Iowa City, Iowa is 34952.

interference. This is due to the channel separation between the two facilities, and results in the condition where interference could potentially occur when the K292FZ field strength is in excess of 107 dBu.

The power density for the proposed facility at a field strength of 107 dBu is given by the following equation:

$$S = \frac{E^2}{Z_0} = \frac{(0.2239)^2}{377} = \mathbf{0.0001329} \quad \text{Eq. 1}$$

In this equation, S represents the calculated power density in Watts per square meter, E is the electric field intensity, which for 107 dBu is 0.2239 Volts per meter, and Z_0 is the characteristic impedance of free space of 377 Ohms.

The power density is also given by:

$$S = \frac{P}{4\pi R^2} \quad \text{Eq. 2}$$

Where S is in the same units, P is the power in Watts (175 in this case), and R is the distance. Rearranging the terms in the equation, it can be solved for the distance to the desired power density as follows:

$$R^2 = \frac{P}{4\pi S} \quad \text{Eq. 3}$$

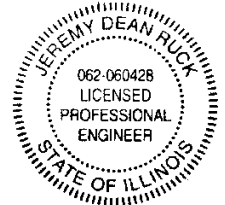
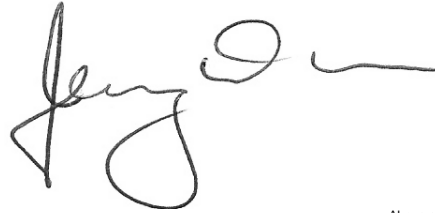
The results of these calculations for depression angles of 0 degrees to 90 degrees are tabulated in Exhibit E-8. It was assumed for these calculations that a Shively 6812-3 antenna would be utilized. This antenna is assumed to be omni-directional in the horizontal plane. The

relative field values at the listed depression angles are based on the published data for the antenna.

The resulting "R" or radius value from Eq. 3 corresponds to the "Field Strength Radius" column in Exhibit E-8. Since each radius is assigned to a specific depression angle, the radius has both a horizontal and vertical component to it. The specific horizontal and vertical distances from the center of radiation were derived using basic trigonometry. Depression angles where the vertical radius is less than approximate 3 meters AGL, including negative values, result in areas where interference is assumed to potentially be experienced by resident population in the area. As indicated in the tabulation, no areas exist below approximately 30 meters above ground level where interference is predicted to occur. It can be reasonably inferred from the satellite photograph in Exhibit E-9 that structures do not extend into the region 30 meters above ground.

The proposed translator should be exempt from environmental processing. The supporting structure to be utilized by KZIA for this translator is a structure that is registered with the Commission. RF exposure hazards to the general public will not exist due to the low effective radiated power. The Commission's *FM Model* software package predicts a maximum power density at ground level of $0.20 \mu\text{W}/\text{cm}^2$ at 46 meters from the base of the structure. This is considerably less than the upper limit permissible under the uncontrolled environment condition of the applicable safety standard. The addition of K292FZ to this structure will also not result in a condition where the aggregate power density at ground level would exceed the uncontrolled environment condition. KZIA will coordinate with other users to reduce power or cease operation as necessary to prevent workers from being exposed to levels of radiofrequency radiation in excess of applicable standards.

The preceding statement and attached exhibits have been prepared by me, or under my direction, and are true and accurate to the best of my belief and knowledge.



Above signature is digitized copy of actual signature
License Expires November 30, 2013

Jeremy D. Ruck, PE
September 23, 2011

K292FZ.X

PROPOSED

Latitude: 41-41-02 N
Longitude: 091-30-31 W
ERP: 0.175 kW
Channel: 292
Frequency: 106.3 MHz
AMSL Height: 324.6 m
Elevation: 235.747 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

KZIA

BLH20010521ABM
Latitude: 42-03-25 N
Longitude: 091-41-42 W
ERP: 100.00 kW
Channel: 275
Frequency: 102.9 MHz
AMSL Height: 531.0 m
Elevation: 258.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

Proposed K292FZ 60 dBu
F(50,50) Service Contour

D.L. Markley & Associates, Inc.

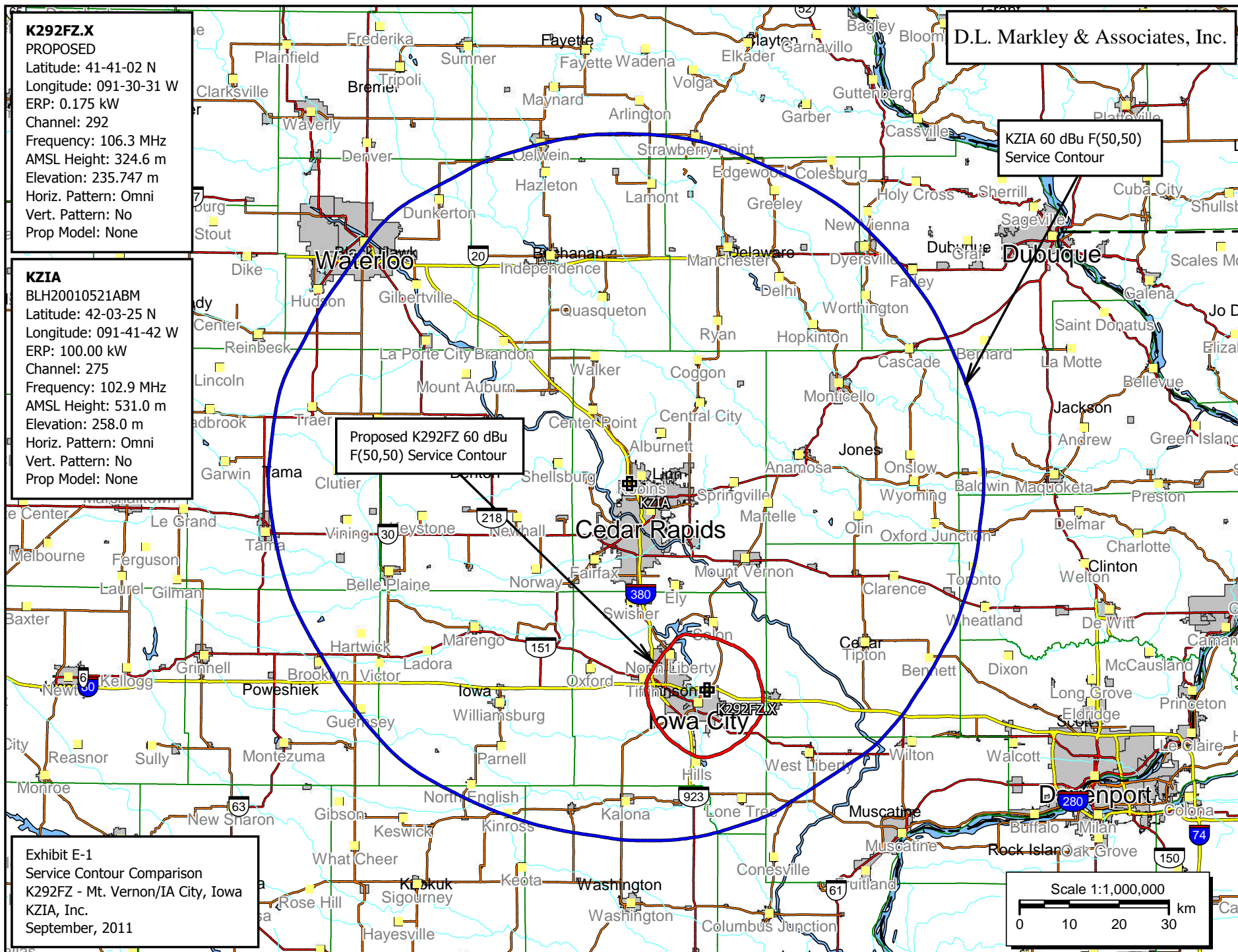
KZIA 60 dBu F(50,50)
Service Contour

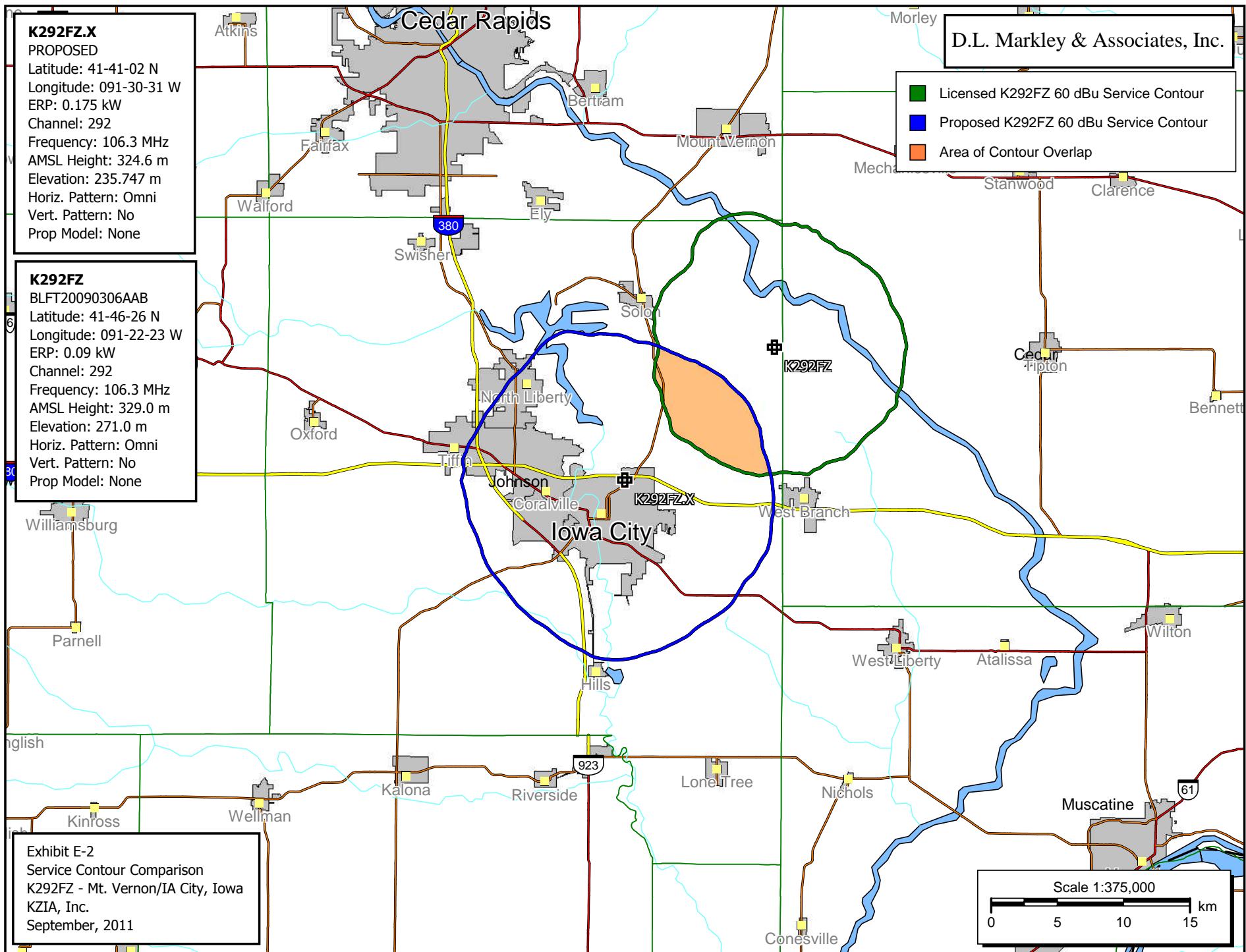
Exhibit E-1

Service Contour Comparison
K292FZ - Mt. Vernon/IA City, Iowa
KZIA, Inc.
September, 2011

Scale 1:1,000,000

0 10 20 30 km





D.L. Markley & Associates, Inc.
Consulting Engineers

Exhibit E-3 - Tabular Allocation Study

REFERENCE CH# 292D - 106.3 MHz, Pwr= 0.175 kW, HAAT= 100.0 M, COR= 324.6 M DISPLAY DATES
41 41 02.0 N. K292FZ - Iowa City, Iowa DATA 09-23-11
91 30 31.0 W. Average Protected F(50-50)= 11.8 km SEARCH 09-23-11
Omni-directional

CH CITY	CALL	TYPE STATE	ANT <--	AZI FILE #	DIST FILE #	LAT LNG	PWR(kw) HAAT(M)	INT(km) COR(M)	PRO(km) LICENSEE	*IN* (Overlap in km)	*OUT*
293C1 Davenport	ALLO	USE IA	101.6 282.2	79.5		41 32 14.0 90 34 30.0	100.000 299	104.0 501	71.5	-35.9*	-8.5
292D Mount Vernon	K292FZ	LIC _C_ IA	48.3 228.4	15.1	BLFT20090306AAB	41 46 26.0 91 22 23.0	0.090 90	33.5 329	10.0	-29.2*	-31.2
293C1 Davenport	KCQQ	LIC _CN IA	93.2 273.9	91.6	BLH19980413KD	41 37 58.0 90 24 38.0	100.000 273	99.6 476	67.8	-19.1*	7.8
295D Iowa City	K295AC	LIC _C_ IA	180.3 0.3	4.2	BLFT20110307AAS	41 38 45.0 91 30 32.0	0.250	1.1 238	7.1	-10.3*	-3.8*
291A Washington	ALLO	USE IA	201.8 21.6	45.3		41 18 18.0 91 42 36.0	6.000 100	42.6 322	27.6	-10.2	-1.6
291A Washington	KCII-FM	LIC _CN IA	201.8 21.6	45.3	BMLH19990525KH	41 18 18.0 91 42 36.0	3.000 91	34.2 316	22.8	-1.8	3.1
292D Port Cargail	628585	APP _C_ MN	131.0 311.3	47.9	BNPFT20030314BWW	41 24 02.0 91 04 32.0	0.250 26	23.8 215	7.1	12.3	0.3
238D Mount Vernon	645382	APP _C_ IA	39.3 219.4	31.3	BNPFT20030317EJV	41 54 04.9 91 16 10.3	0.140 113	12.5 372	12.5	9.5R	21.8M
289C0 Waterloo	ALLO	USE IA	329.6 149.2	93.7		42 24 35.0 92 05 10.0	100.000 450	12.2 728	83.7	69.6	9.1
289C0 Waterloo	KOKZ	LIC _CN IA	329.6 149.2	93.7	BLH19850613KC	42 24 35.0 92 05 10.0	100.000 403	11.7 683	80.4	70.1	12.4
295D Muscatine	646823	APP _C_ IA	120.7 301.1	48.7	BNPFT20030317HOQ	41 27 33.9 91 00 26.5	0.092 132	0.7 331	11.3	36.1	36.5
239A Anamosa	AU3729851	USE IA	15.5 195.6	47.3	RM8924	42 05 40.0 91 21 18.0	6.000 100	30.8 370	28.6	9.5R	37.8M
239A Anamosa	KKSJ	LIC _CX IA	15.1 195.2	47.8	BLH20080213AAO	42 05 56.0 91 21 28.4	6.000 100	30.2 367	28.2	9.5R	38.3M
292D Dyersville	K292FR	LIC _C_ IA	21.2 201.4	90.4	BLFT20070122AAM	42 26 31.0 91 06 38.0	0.055 139	37.0 446	11.1	43.1	44.8
294C2 Grinnell	ALLO	USE IA	278.1 97.3	96.5		41 47 59.0 92 39 29.0	50.000 150	6.0 443	52.3	78.2	43.2
294C2 Grinnell	KRTI	LIC _CN IA	278.3 97.5	97.5	BLH19930601KB	41 48 16.0 92 40 09.0	50.000 150	6.0 443	52.3	79.2	44.3
292C3 Ankeny	ALLO	USE IA	275.3 93.9	176.3		41 48 35.0 93 37 16.0	25.000 100	116.0 388	41.1	48.1	93.3
292C3 Ankeny	KPTL	LIC _CX IA	270.5 89.1	173.8	BLH20110208AAT	41 40 45.0 93 35 46.0	25.000 100	112.0 375	37.5	49.5	94.3

Terrain database is NGDC 30 SEC , R= 73.215 qualifying spacings or FCC minimum Spacings in KM, M= Margin in KM
Contour distances are on direct line to and from reference station. Reference zone= West Zone, Co to 3rd adjacent.
Ant Column: (D= DA Standard, Z= DA 73.215, N= Not DA 73.215, _= Omni), Polarization (C,H,V,E), Beamtilt(Y,N,X)
"*"affixed to 'IN' or 'OUT' values = site inside protected contour.
Reference station has protected zone issue: AM tower

PROPOSED
Latitude: 41-41-02 N
Longitude: 091-30-31 W
ERP: 0.175 kW
Channel: 292
Frequency: 106.3 MHz
AMSL Height: 324.6 m
Elevation: 235.747 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None






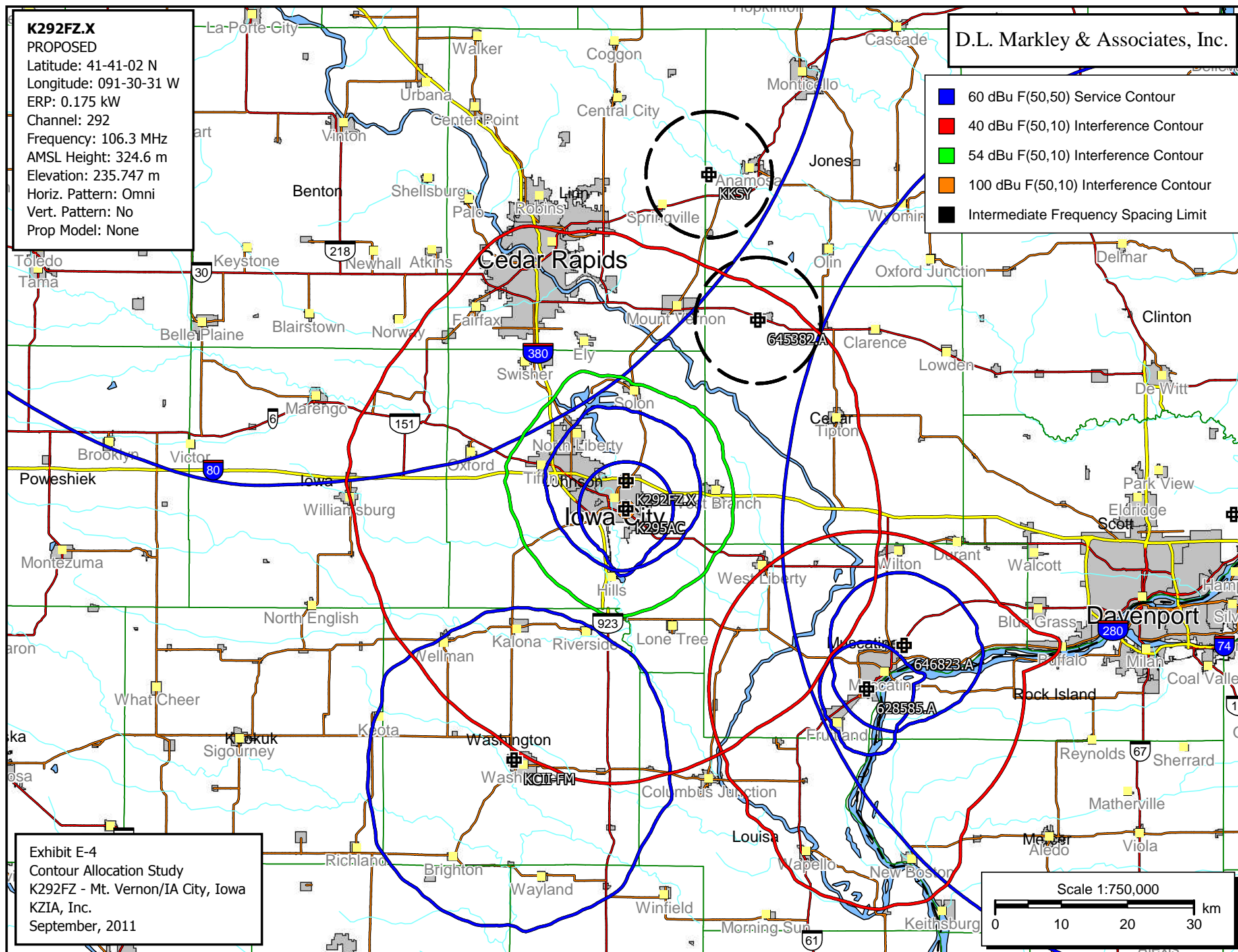
-  60 dBu F(50,50) Service Contour
-  40 dBu F(50,10) Interference Contour
-  54 dBu F(50,10) Interference Contour
-  100 dBu F(50,10) Interference Contour
-  Intermediate Frequency Spacing Limit

Exhibit E-4
Contour Allocation Study
K292FZ - Mt. Vernon/IA City, Iowa
KZIA, Inc.
September, 2011



K295AC

BLFT20110307AAS
Latitude: 41-38-45 N
Longitude: 091-30-32 W
ERP: 0.25 kW
Channel: 295
Frequency: 106.9 MHz
AMSL Height: 238.0 m
Elevation: 225.0 m
Horiz. Pattern: Omni
Vert. Pattern: Yes
Elec Tilt: 0.0
Prop Model: Longley/Rice
Climate: Cont temperate
Conductivity: 0.0050
Dielec Const: 15.0
Refractivity: 311.0
Receiver Ht AG: 9.1 m
Receiver Gain: 0 dB
Time Variability: 50.0%
Sit. Variability: 50.0%
ITM Mode: Broadcast

D.L. Markley & Associates, Inc.

- ☐ K295AC (295)
- ☐ K292FZ.X (292)

Proposed K292FZ
Transmitter Site

K295AC Site

Iowa City

K295AC

K292FZ.X

Exhibit E-5
Longley-Rice Interference Study
K292FZ - Mt. Vernon/IA City, Iowa
KZIA, Inc.
September, 2011

Note: Longley-Rice does not predict
any interference to K295AC from
the proposed K292FZ operation.

Scale 1:30,000

0 0.4 0.8 1.2 km

Exhibit E-6 - Longley-Rice Interference Study Population Summary

Population Database: 2010 US Census (PL)

K295AC (295) Iowa City, IA - BLFT20110307AAS
Lat: 41-38-45 N Lng: 091-30-32 W ERP: 0.25 kW AMSL: 238.0 m
FM Interference Study
Protected: Circle: R = 25 km
Interference considered within 120 km.
Signal Resolution: 0.1 km

Study Date: 9/23/2011
FM Database Date: 9/23/2011

D/U Ratios Used:

Co: 20.0 dB
First Adj: 6.0 dB
Second Adj: -40.0 dB
Third Adj: -40.0 dB

Threshold for reception: 48.0 dBu.

Primary Terrain: V-Soft 3 Second US Terrain
Secondary Terrain: V-Soft 30 Second US Database

Population Database: 2010 US Census (PL)

Percentages calculated using a baseline population of 128,025.

Stations considered which do not cause interference:

K292FZ.X (292)

Call Letters	City	State	Dist	Azi
K292FZ.X (292)	Mount Vernon	IA	4.2	0.3

Totals for K295AC (295)

Calculation Area Population:	142,104	[1961.1 sq. km]
Not Affected by Terrain Loss:	128,025	[1384.8 sq. km]
Interfered Population:	0	[0.0 sq. km]
Interference Free:	128,025	[1384.8 sq. km]
Percent Interference:	0.00 %	
Terrain Blocked Population:	14,079	[576.3 sq. km]
Contour Area Population:	141,910	

Interference Free Breakdown:

White:	105,588	[82.5%]
Black:	6,138	[4.8%]
Hispanic:	6,617	[5.2%]
Native American:	228	[0.2%]
Asian:	6,745	[5.3%]
Pacific Islander:	46	[0.0%]
Mixed Race:	2,435	[1.9%]
Other:	228	[0.2%]
Total:	128,025	

	Housing Units	Population	%
Iowa			
Cedar County			
Total	8,064	18,499	
K295AC (295)	1,083	2,628	
IxFree	1,083	2,628	100.00
Johnson County			
Total	55,967	130,882	
K295AC (295)	52,353	121,866	
IxFree	52,353	121,866	100.00
Linn County			
Total	92,251	211,226	
K295AC (295)	16	38	
IxFree	16	38	100.00
Muscatine County			
Total	17,910	42,745	
K295AC (295)	514	1,425	
IxFree	514	1,425	100.00
Washington County			
Total	9,516	21,704	
K295AC (295)	846	2,068	
IxFree	846	2,068	100.00

K292FZ.X

BLFT20090306AAB
Latitude: 41-41-02 N
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AMSL Height: 324.6 m
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Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

K295AC

BLFT20110307AAS
Latitude: 41-38-45 N
Longitude: 091-30-32 W
ERP: 0.25 kW
Channel: 295
Frequency: 106.9 MHz
AMSL Height: 238.0 m
Elevation: 210.0 m
Horiz. Pattern: Omni
Vert. Pattern: No
Prop Model: None

Proposed 107 dBu
F(50,10) Contour

D.L. Markley & Associates, Inc.

- 70 dBu F(50,50) Contour
- 69 dBu F(50,50) Contour
- 68 dBu F(50,50) Contour
- 67 dBu F(50,50) Contour

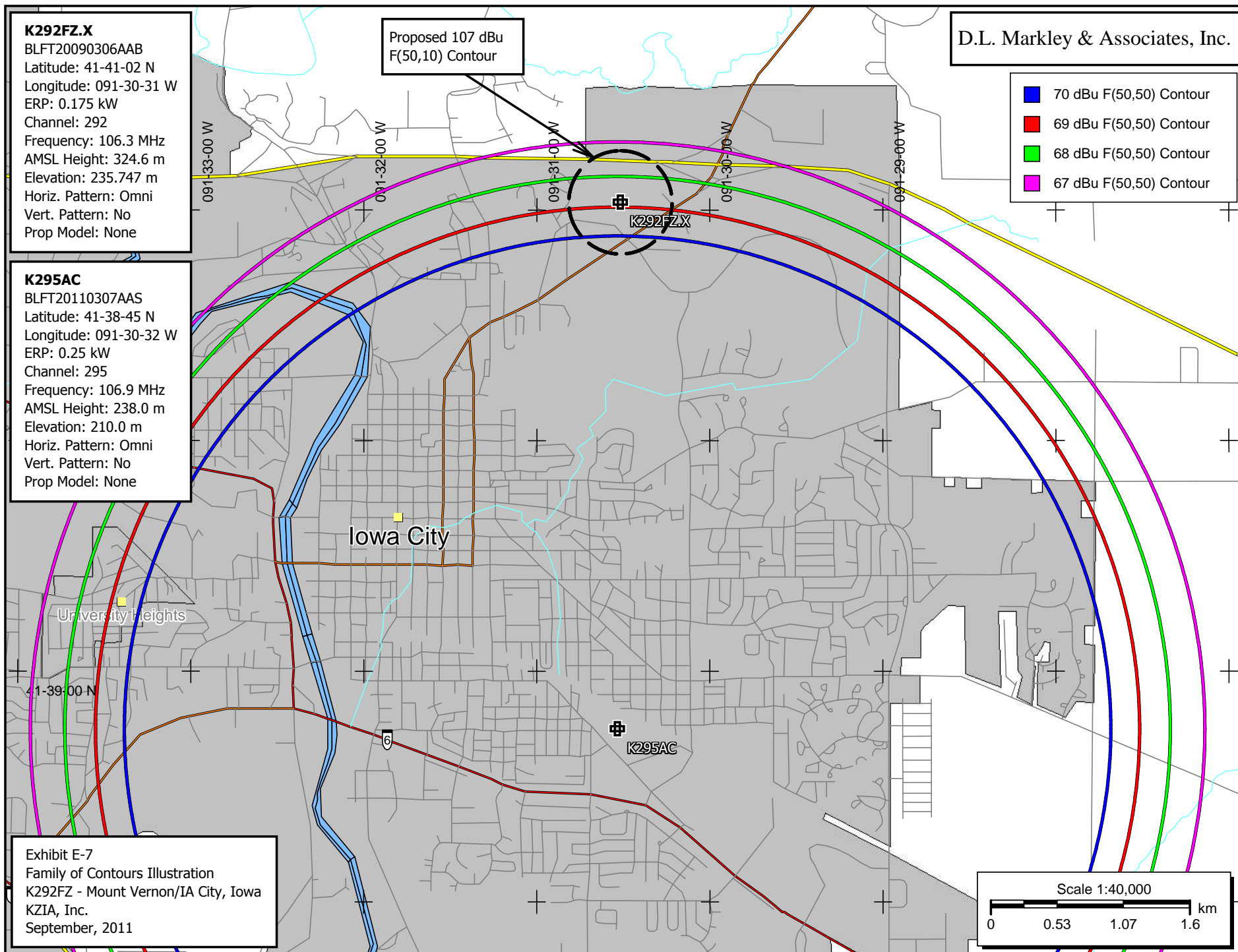


Exhibit E-7
Family of Contours Illustration
K292FZ - Mount Vernon/IA City, Iowa
KZIA, Inc.
September, 2011

Exhibit E-8 - Summary of Power Density Calculations								
Facility:	K292FZ							
COR:		89.9	m AGL				Z0 (Ohms)	377
ERP:		175	Watts				ALL distances meters	
Antenna:		SHI 6812-3						
FS Contour:		107	dBu					
E Field Strength:		0.2239	V/m					
Power Density:		0.0001329409	W/m^2					
Dep.			ERP in	Radius	Field Strength	Radius	Radius	Radius
θ	Erel	Prel	Watts	Squared	Radius	Vert. Dist.	AGL	Horiz. Dist.
0	1.000	1.000	175.00	104753.739	323.66	0.00	89.90	323.66
1	0.997	0.994	173.95	104126.160	322.69	5.63	84.27	322.64
2	0.988	0.976	170.83	102254.734	319.77	11.16	78.74	319.58
3	0.973	0.947	165.68	99173.403	314.92	16.48	73.42	314.49
4	0.952	0.906	158.60	94938.733	308.12	21.49	68.41	307.37
5	0.926	0.857	150.06	89823.817	299.71	26.12	63.78	298.57
6	0.894	0.799	139.87	83722.960	289.35	30.25	59.65	287.76
7	0.858	0.736	128.83	77115.932	277.70	33.84	56.06	275.63
8	0.816	0.666	116.52	69750.906	264.10	36.76	53.14	261.53
9	0.771	0.594	104.03	62269.918	249.54	39.04	50.86	246.47
10	0.723	0.523	91.48	54757.817	234.00	40.63	49.27	230.45
11	0.671	0.450	78.79	47164.428	217.17	41.44	48.46	213.18
12	0.616	0.379	66.40	39749.435	199.37	41.45	48.45	195.02
13	0.560	0.314	54.88	32850.773	181.25	40.77	49.13	176.60
14	0.502	0.252	44.10	26398.361	162.48	39.31	50.59	157.65
15	0.443	0.196	34.34	20557.817	143.38	37.11	52.79	138.49
16	0.384	0.147	25.80	15446.567	124.28	34.26	55.64	119.47
17	0.325	0.106	18.48	11064.614	105.19	30.75	59.15	100.59
18	0.267	0.071	12.48	7467.789	86.42	26.70	63.20	82.19
19	0.210	0.044	7.72	4619.640	67.97	22.13	67.77	64.26
20	0.155	0.024	4.20	2516.709	50.17	17.16	72.74	47.14
21	0.102	0.010	1.82	1089.858	33.01	11.83	78.07	30.82
22	0.052	0.003	0.47	283.254	16.83	6.30	83.60	15.60
23	0.004	0.000	0.00	1.676	1.29	0.51	89.39	1.19
24	0.040	0.002	0.28	167.606	12.95	5.27	84.63	11.83
25	0.081	0.007	1.15	687.289	26.22	11.08	78.82	23.76
26	0.118	0.014	2.44	1458.591	38.19	16.74	73.16	34.33
27	0.151	0.023	3.99	2388.490	48.87	22.19	67.71	43.55
28	0.181	0.033	5.73	3431.837	58.58	27.50	62.40	51.72
29	0.206	0.042	7.43	4445.330	66.67	32.32	57.58	58.31
30	0.227	0.052	9.02	5397.855	73.47	36.74	53.16	63.63
31	0.244	0.060	10.42	6236.619	78.97	40.67	49.23	67.69
32	0.257	0.066	11.56	6918.880	83.18	44.08	45.82	70.54
33	0.266	0.071	12.38	7411.956	86.09	46.89	43.01	72.20
34	0.272	0.074	12.95	7750.101	88.03	49.23	40.67	72.98
35	0.274	0.075	13.14	7864.492	88.68	50.87	39.03	72.64
36	0.272	0.074	12.95	7750.101	88.03	51.75	38.15	71.22
37	0.267	0.071	12.48	7467.789	86.42	52.01	37.89	69.02
38	0.260	0.068	11.83	7081.353	84.15	51.81	38.09	66.31

Exhibit E-8 - Summary of Power Density Calculations								
Facility:	K292FZ							
COR:		89.9	m AGL				Z0 (Ohms)	377
ERP:		175	Watts				ALL distances meters	
Antenna:		SHI 6812-3						
FS Contour:		107	dBu					
E Field Strength:		0.2239	V/m					
Power Density:		0.0001329409	W/m^2					
Dep.			ERP in	Radius	Field Strength	Radius	Radius	Radius
θ	Erel	Prel	Watts	Squared	Radius	Vert. Dist.	AGL	Horiz. Dist.
39	0.249	0.062	10.85	6494.837	80.59	50.72	39.18	62.63
40	0.236	0.056	9.75	5834.364	76.38	49.10	40.80	58.51
41	0.221	0.049	8.55	5116.277	71.53	46.93	42.97	53.98
42	0.205	0.042	7.35	4402.276	66.35	44.40	45.50	49.31
43	0.186	0.035	6.05	3624.060	60.20	41.06	48.84	44.03
44	0.167	0.028	4.88	2921.477	54.05	37.55	52.35	38.88
45	0.146	0.021	3.73	2232.931	47.25	33.41	56.49	33.41
46	0.124	0.015	2.69	1610.693	40.13	28.87	61.03	27.88
47	0.103	0.011	1.86	1111.332	33.34	24.38	65.52	22.74
48	0.080	0.006	1.12	670.424	25.89	19.24	70.66	17.33
49	0.058	0.003	0.59	352.392	18.77	14.17	75.73	12.32
50	0.036	0.001	0.23	135.761	11.65	8.93	80.97	7.49
51	0.014	0.000	0.03	20.532	4.53	3.52	86.38	2.85
52	0.007	0.000	0.01	5.133	2.27	1.79	88.11	1.39
53	0.028	0.001	0.14	82.127	9.06	7.24	82.66	5.45
54	0.047	0.002	0.39	231.401	15.21	12.31	77.59	8.94
55	0.066	0.004	0.76	456.307	21.36	17.50	72.40	12.25
56	0.083	0.007	1.21	721.649	26.86	22.27	67.63	15.02
57	0.100	0.010	1.75	1047.537	32.37	27.14	62.76	17.63
58	0.115	0.013	2.31	1385.368	37.22	31.56	58.34	19.72
59	0.129	0.017	2.91	1743.207	41.75	35.79	54.11	21.50
60	0.141	0.020	3.48	2082.609	45.64	39.52	50.38	22.82
61	0.153	0.023	4.10	2452.180	49.52	43.31	46.59	24.01
62	0.162	0.026	4.59	2749.157	52.43	46.30	43.60	24.62
63	0.171	0.029	5.12	3063.104	55.35	49.31	40.59	25.13
64	0.177	0.031	5.48	3281.830	57.29	51.49	38.41	25.11
65	0.183	0.033	5.86	3508.098	59.23	53.68	36.22	25.03
66	0.187	0.035	6.12	3663.134	60.52	55.29	34.61	24.62
67	0.190	0.036	6.32	3781.610	61.49	56.61	33.29	24.03
68	0.191	0.036	6.38	3821.521	61.82	57.32	32.58	23.16
69	0.192	0.037	6.45	3861.642	62.14	58.01	31.89	22.27
70	0.191	0.036	6.38	3821.521	61.82	58.09	31.81	21.14
71	0.189	0.036	6.25	3741.908	61.17	57.84	32.06	19.92
72	0.185	0.034	5.99	3585.197	59.88	56.95	32.95	18.50
73	0.181	0.033	5.73	3431.837	58.58	56.02	33.88	17.13
74	0.176	0.031	5.42	3244.852	56.96	54.76	35.14	15.70
75	0.170	0.029	5.06	3027.383	55.02	53.15	36.75	14.24
76	0.163	0.027	4.65	2783.202	52.76	51.19	38.71	12.76
77	0.155	0.024	4.20	2516.709	50.17	48.88	41.02	11.29

Exhibit E-8 - Summary of Power Density Calculations								
Facility:	K292FZ							
COR:		89.9	m AGL				Z0 (Ohms)	377
ERP:		175	Watts				ALL distances meters	
Antenna:		SHI 6812-3						
FS Contour:		107	dBu					
E Field Strength:		0.2239	V/m					
Power Density:		0.0001329409	W/m^2					
Dep.			ERP in	Radius	Field Strength	Radius	Radius	Radius
θ	Erel	Prel	Watts	Squared	Radius	Vert. Dist.	AGL	Horiz. Dist.
78	0.146	0.021	3.73	2232.931	47.25	46.22	43.68	9.82
79	0.137	0.019	3.28	1966.123	44.34	43.53	46.37	8.46
80	0.127	0.016	2.82	1689.573	41.10	40.48	49.42	7.14
81	0.116	0.013	2.35	1409.566	37.54	37.08	52.82	5.87
82	0.105	0.011	1.93	1154.910	33.98	33.65	56.25	4.73
83	0.093	0.009	1.51	906.015	30.10	29.88	60.02	3.67
84	0.081	0.007	1.15	687.289	26.22	26.07	63.83	2.74
85	0.069	0.005	0.83	498.733	22.33	22.25	67.65	1.95
86	0.056	0.003	0.55	328.508	18.12	18.08	71.82	1.26
87	0.042	0.002	0.31	184.786	13.59	13.57	76.33	0.71
88	0.029	0.001	0.15	88.098	9.39	9.38	80.52	0.33
89	0.015	0.000	0.04	23.570	4.85	4.85	85.05	0.08
90	0.000	0.000	0.00	0.000	0.00	0.00	89.90	0.00

Exhibit E-9
Satellite Photograph of Tower Vicinity

