**REQUEST FOR APPROVAL
OF SPECIFIED RADIATION EFFICIENCIES
FOR
VALCOM 85 FOOT POLE WITH VALCOSPHERE
OVER THE RANGE OF 1200 KHZ TO 1390 KHZ
AND
VALCOM 75 FOOT POLE WITH VALCOSPHERE
OVER THE RANGE OF 1390 KHZ TO 1700 KHZ**

ENGINEERING STATEMENT

The engineering exhibit of which this statement is part has been prepared to present and show the analysis of field strength measurements that were made to determine the radiation efficiency of an 85-foot pole transmitting antenna manufactured by the Valcom Manufacturing Group, Ltd. ["the manufacturer"] on 1200 KHz and 1390 KHz and for a 75-foot pole transmitting antenna of like construction on 1390 KHz and 1700 KHz. The field strength measurement results were used to calculate unattenuated radiation efficiencies at 10 KHz increments between 1200 KHz and 1390 KHz for the 85-foot model and between 1390 KHz and 1700 KHz for the 75-foot model.

The test measurements were made on each model pole during daytime hours with a power input of 250 watts from a test transmitter site beside the manufacturer's factory in Guelph, Ontario. The antenna under test consisted in each case of the manufacturer's standard pole with a "Valcosphere" (a wire-framed sphere) at the top and coil-loading centered approximately 1/3 of the total height above its base. The location was situated near the center of a 300 foot by 400 foot field and employed 120 buried copper wire ground radials that were each 120 feet in length. The operation was supervised, and the field strength measurements were made, by members of the manufacturer's engineering staff.

The 1200 KHz field strength measurements were made in November and early December of 2005 and the 1390 KHz and 1700 KHz measurements were made in late October and November of 2006 to ensure that all were subject to similar environmental conditions. The power was maintained at the 250-watt level using the direct method of power determination that is described in Section 73.51 of the Federal Communications Commission's Rules. Details regarding the antenna input resistance and input current measurements are in the possession of the manufacturer. The field strength measurements were made using a Potomac Instruments type FIM-41 field strength meter at locations chosen to conform as closely to the recommendations of Section 73.186 of the Federal Communications Commission's Rules as practicable – considering the physical characteristics of the terrain surrounding the transmitter site - using topographic maps with the assistance of a GPS receiver that was programmed to have its reference point at the transmitter site.

As it was impossible to space the radials evenly due to nearby terrain characteristics, a total of seven radials were measured instead of the six that are required as a minimum by Section 73.186 of the Rules. The maps showing the measurement locations are in the possession of the manufacturer.

Figure 1 is a tabulation of the 1200 KHz field strength measurement data for the 85-foot pole and Figure 2 shows its graphical analysis. Figure 3 is a tabulation of the 1390 KHz field strength measurement data for the 85-foot pole while Figure 4 shows its graphical analysis. Figure 5 is a tabulation of the 1390 KHz field strength measurement data for the 75-foot pole and its graphical analysis is shown in Figure 6. Figure 7 is a tabulation of the 1700 KHz field strength measurement data for the 75-foot pole while Figure 8 shows its graphical analysis.

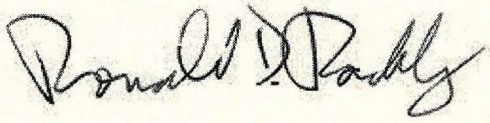
The field strength measurements were analyzed in accordance with the "best fit" method outlined in Section 73.186 of the Federal Communications Commission's Rules, using Graphs 15, 17 and 20 of Section 73.184 to determine the ground conductivity values of the measurements at 1200 KHz, 1390 KHz and 1700 KHz, respectively. The measurement data indicate that the 85-foot Valcom pole produced unattenuated field strength levels at 1200 KHz and 1390 KHz of 141 mV/M and 144.6 mV/M at one kilometer, respectively, and that the 75-foot Valcom pole produced values of 141.6 mV/M and 146.4 mV/M at 1390 KHz and 1700 KHz with 250 watts input power. The analyzed ground conductivity values agree well on a radial-to-radial basis – with variations among the different frequencies falling within the normally expected range considering the non-homogenous nature of "real world" soil - and unambiguously support the analyzed antenna efficiencies.

The observed 141 mV/M and 144.6 mV/M unattenuated field levels for the 85-foot Valcom pole with 250 watts input power correspond to 1 KW values of 282 mV/M and 289.2 mV/M at 1200 KHz and 1390 KHz, respectively, while the observed values of 141.6 mV/M and 146.4 mV/M correspond to 1KW values of 283.2 mV/M and 292.8 mV/M for the 75-foot model at 1390 KHz and 1700 KHz. Figure 9 is a tabulation of calculated radiation efficiency values at 10 KHz increments that are based on these measured values.

The dimensions and pertinent characteristics of the 85-foot and 75-foot Valcom pole antennas that were tested appear in Figures 10 and 11, respectively. Figure 12 is a sketch of the ground system.

The observed unattenuated field values of Valcom poles exceed those shown for their physical heights on the graph which appears as Figure 8 of Section 73.190 of the FCC Rules. Two aspects of their design are responsible for this, their Valcosphere top-loading and their loading coils that are situated far enough above ground to reduce the antenna-to ground voltage in the base region which, in turn, reduces dielectric losses in the nearby soil. The effects lead to antenna efficiency improvements that are predictable and measurable.

The use of the physical heights of Valcom pole antennas to calculate their vertical radiation characteristics, as is done for conventional tower antennas, has previously been approved by the FCC based on a theoretical study prepared by the undersigned. [See Attachment A.] The field strength measurement data contained herein demonstrate that their radiation efficiency values can be known before they are constructed, within the frequency bands that were studied, and that proof-of-performance measurements after construction therefore are not necessary when they are used on frequencies within these ranges. It is requested that the FCC approve the unattenuated radiation values shown in the tabulation of Figure 9 for construction permit applicants proposing Valcom pole antennas in place of the values shown for their physical heights on Figure 8 of Section 73.190 of the FCC Rules.



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January 26, 2007

Valcom AM Broadcast Antenna
(85 foot with Valcosphere)
Operating Frequency: 1200 kHz

0 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	12/5/05	1618	450
2	0.45	12/5/05	1606	220
3	0.62	12/5/05	1515	185
4	0.75	12/5/05	1510	145
5	1.00	12/5/05	1505	110
6	1.25	12/5/05	1456	100
7	1.50	12/5/05	1445	80.0
8	1.80	12/5/05	1441	62.0
9	2.25	12/5/05	1437	50.0
10	2.50	12/5/05	1434	43.0
11	3.00	12/5/05	1428	33.0
12	4.00	12/5/05	1424	21.5
13	5.00	12/5/05	1418	13.5
14	7.00	12/5/05	1416	10.0
15	8.00	12/5/05	1408	7.00
16	9.50	12/5/05	1404	6.60
17	11.00	12/5/05	1359	6.00
18	13.00	12/5/05	1354	5.20
19	15.00	12/5/05	1350	3.30

Valcom AM Broadcast Antenna
(85 foot with Valcosphere)
Operating Frequency: 1200 kHz

40 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	11/28/05	1601	470
2	0.50	11/28/05	1610	195
3	0.75	11/28/05	1618	140
4	1.10	11/28/05	1625	100
5	1.48	11/28/05	1353	64.0
6	1.76	11/28/05	1520	54.0
7	2.00	11/28/05	1345	50.5
8	3.00	11/28/05	1339	24.5
9	4.00	11/28/05	1335	17.0
10	5.00	11/28/05	1331	10.0
11	6.00	11/28/05	1328	7.50
12	7.00	11/28/05	1324	5.40
13	9.10	11/28/05	1319	4.00
14	11.00	11/28/05	1312	3.10
15	13.00	11/28/05	1306	2.00
16	14.70	11/28/05	1300	1.30

Valcom AM Broadcast Antenna
(85 foot with Valcosphere)
Operating Frequency: 1200 kHz

100 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.26	11/28/05	1551	430
2	0.50	11/28/05	1546	190
3	0.75	11/28/05	1535	115
4	1.00	11/28/05	1132	97.0
5	1.27	11/28/05	1140	82.0
6	1.50	11/28/05	1145	66.0
7	1.79	11/28/05	1146	53.0
8	2.21	11/28/05	1149	35.0
9	2.77	11/28/05	1155	22.0
10	4.00	11/28/05	1200	17.0
11	6.00	11/28/05	1209	10.0
12	7.02	11/28/05	1216	5.80
13	9.00	11/28/05	1222	4.60
14	11.50	11/28/05	1229	2.30
15	13.00	11/28/05	1234	1.60
16	14.20	11/28/05	1239	1.20

Valcom AM Broadcast Antenna
(85 foot with Valcosphere)
Operating Frequency: 1200 kHz

160 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	11/30/05	1227	399
2	0.50	11/30/05	1230	222
3	0.75	11/30/05	1235	140
4	1.03	11/30/05	1240	110
5	1.35	11/30/05	1242	75.0
6	1.75	11/30/05	1245	58.0
7	2.00	11/30/05	1248	54.0
8	2.50	11/30/05	1253	38.5
9	3.23	11/30/05	1257	30.0
10	4.00	11/30/05	1305	10.0
11	5.00	11/30/05	1315	9.30
12	7.50	11/30/05	1320	6.30
13	9.00	11/30/05	1332	3.20
14	11.10	11/30/05	1338	2.60
15	13.00	11/30/05	1344	1.70
16	15.00	11/30/05	1350	1.30

Valcom AM Broadcast Antenna
(85 foot with Valcosphere)
Operating Frequency: 1200 kHz

215 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	11/30/05	1540	410
2	0.60	11/30/05	1536	180
3	0.90	11/30/05	1525	90.0
4	1.40	11/30/05	1518	55.0
5	1.80	11/30/05	1516	35.0
6	2.30	11/30/05	1514	30.5
7	3.00	11/30/05	1509	21.5
8	4.00	11/30/05	1505	14.0
9	5.00	11/30/05	1458	9.50
10	7.25	11/30/05	1452	6.30
11	8.00	11/30/05	1447	4.30
12	10.00	11/30/05	1440	3.80
13	11.00	11/30/05	1430	2.70
14	13.00	11/30/05	1422	2.40
15	15.00	11/30/05	1417	2.00

Valcom AM Broadcast Antenna
(85 foot with Valcosphere)
Operating Frequency: 1200 kHz

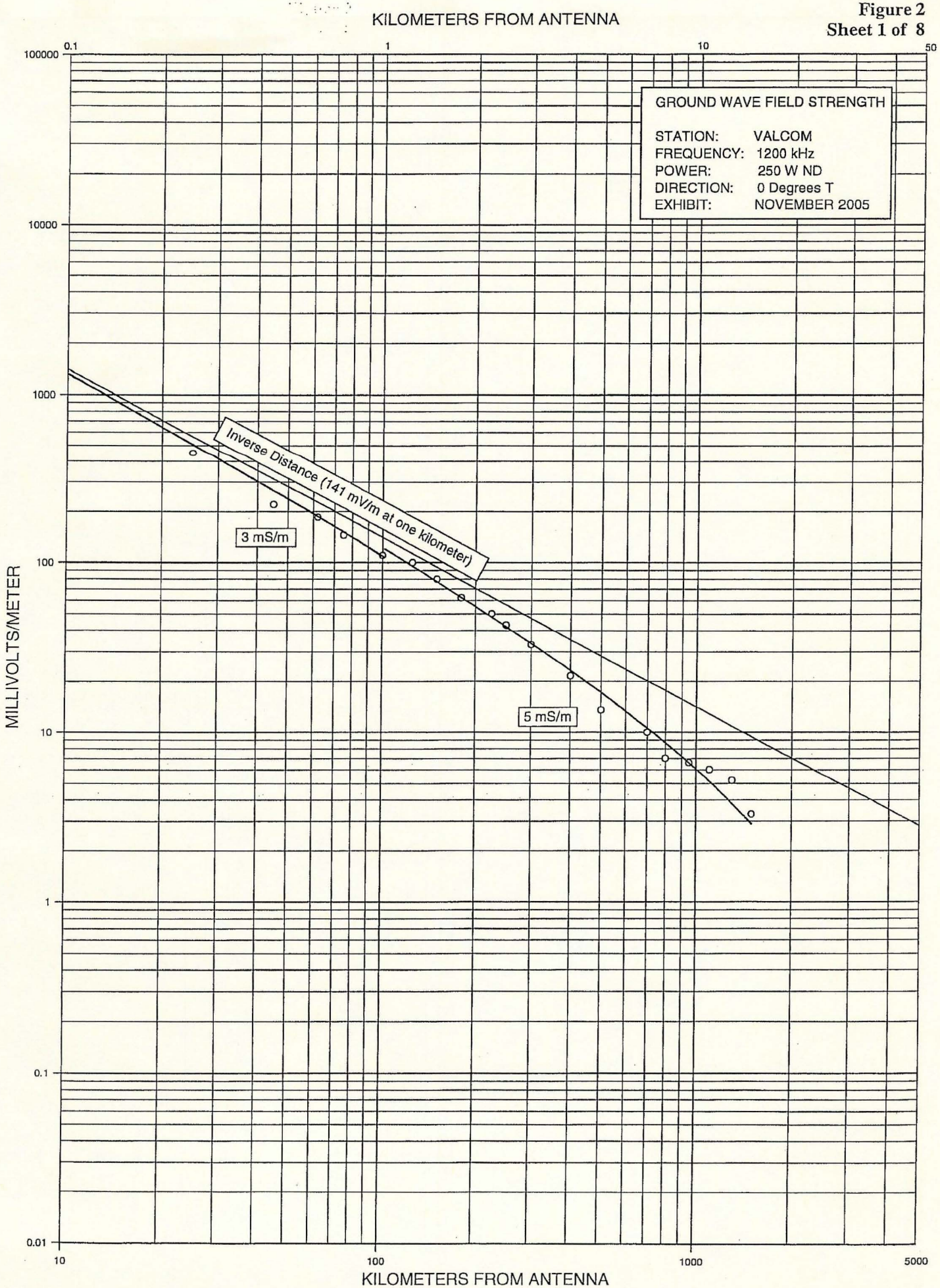
270 Degree Radial

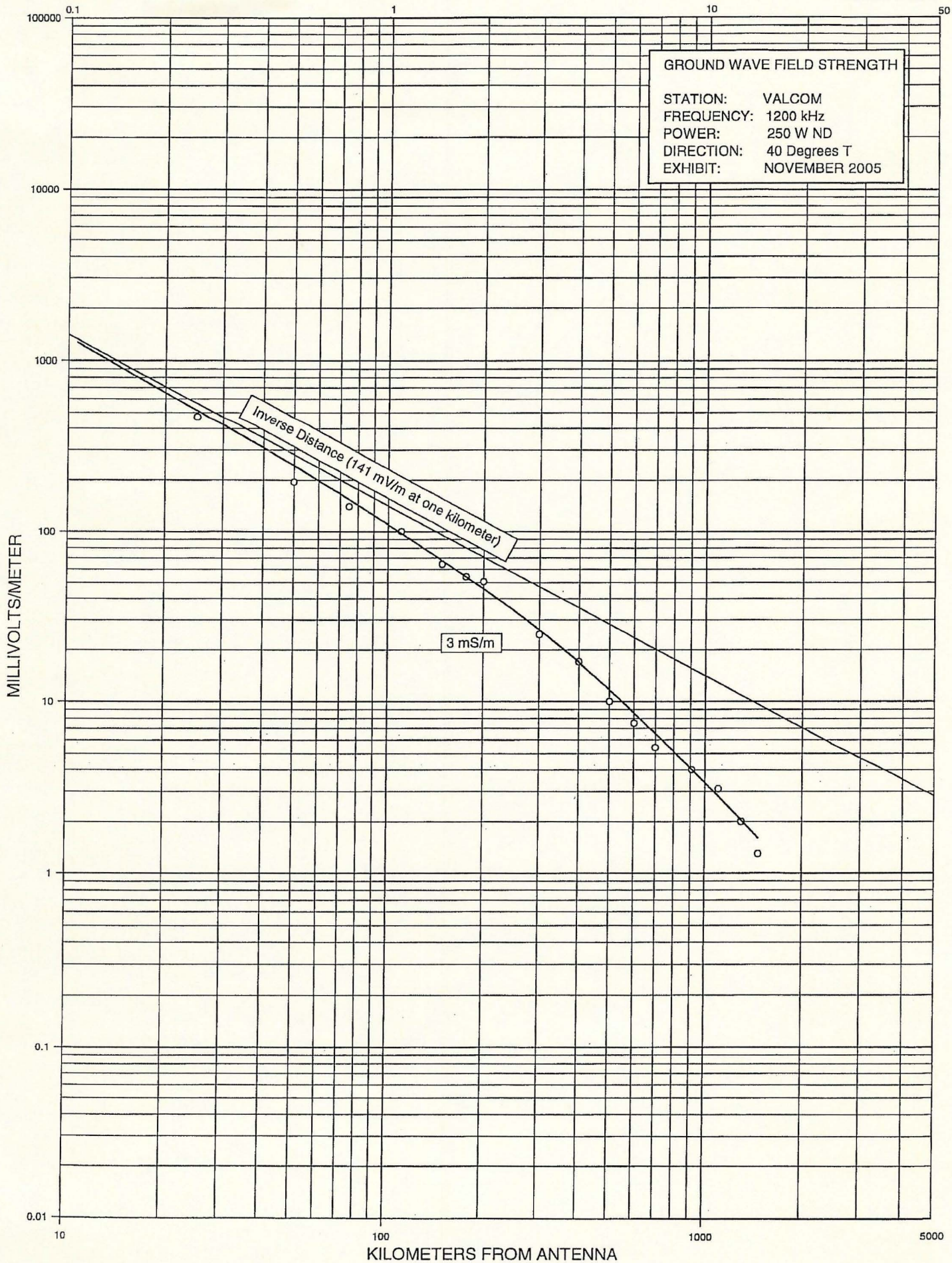
Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	12/5/05	1118	450
2	0.58	12/5/05	1122	200
3	0.75	12/5/05	1125	155
4	0.95	12/5/05	1129	126
5	1.25	12/5/05	1143	100
6	1.50	12/5/05	1146	80.0
7	1.75	12/5/05	1158	65.0
8	2.00	12/5/05	1203	43.0
9	2.50	12/5/05	1207	45.0
10	2.92	12/5/05	1212	32.0
11	4.00	12/5/05	1215	20.0
12	5.00	12/5/05	1220	11.5
13	7.00	12/5/05	1230	10.0
14	8.50	12/5/05	1238	7.00
15	10.60	12/5/05	1246	5.50
16	13.50	12/5/05	1300	4.50
17	15.50	12/5/05	1305	3.00

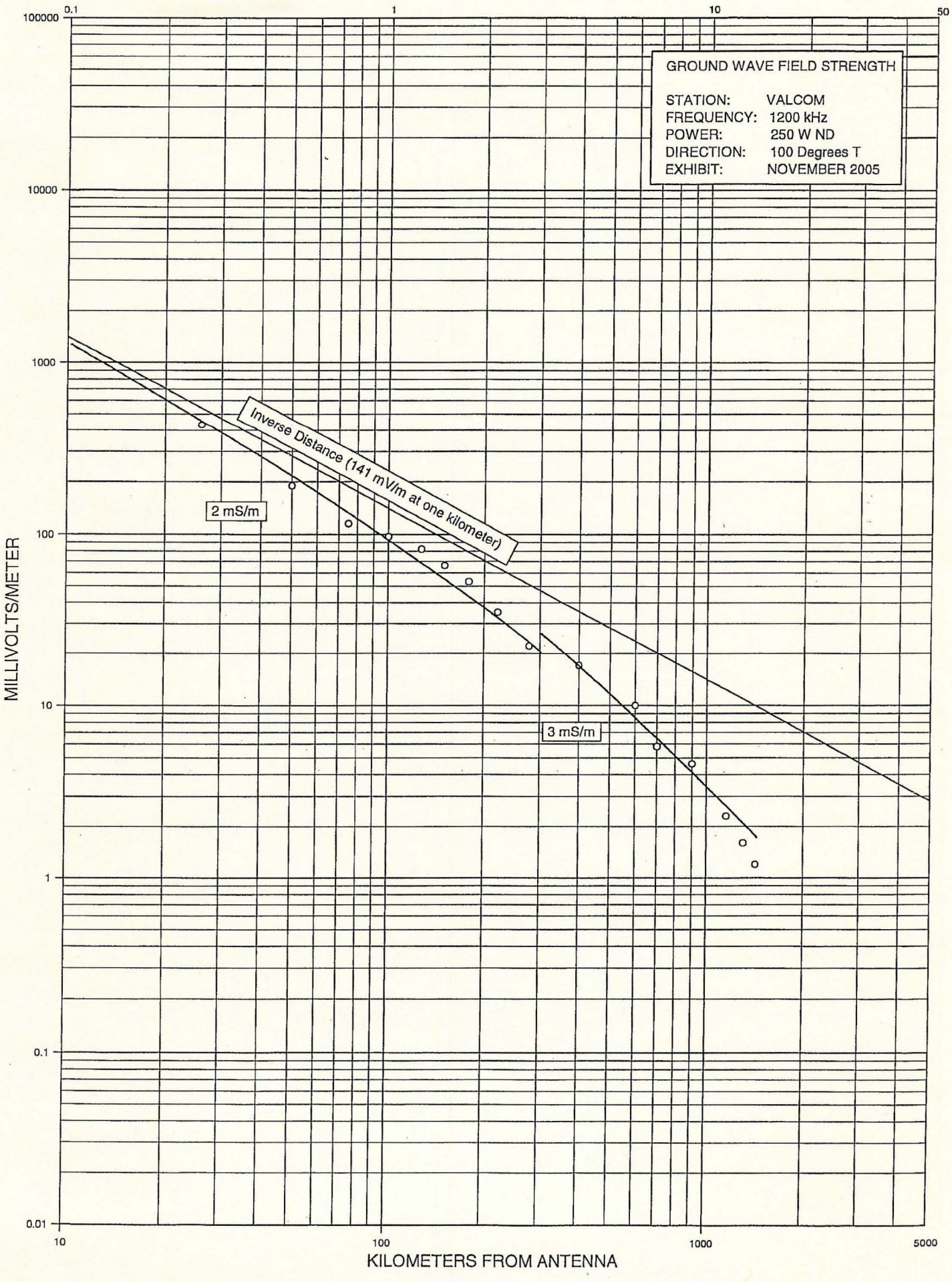
Valcom AM Broadcast Antenna
(85 foot with Valcosphere)
Operating Frequency: 1200 kHz

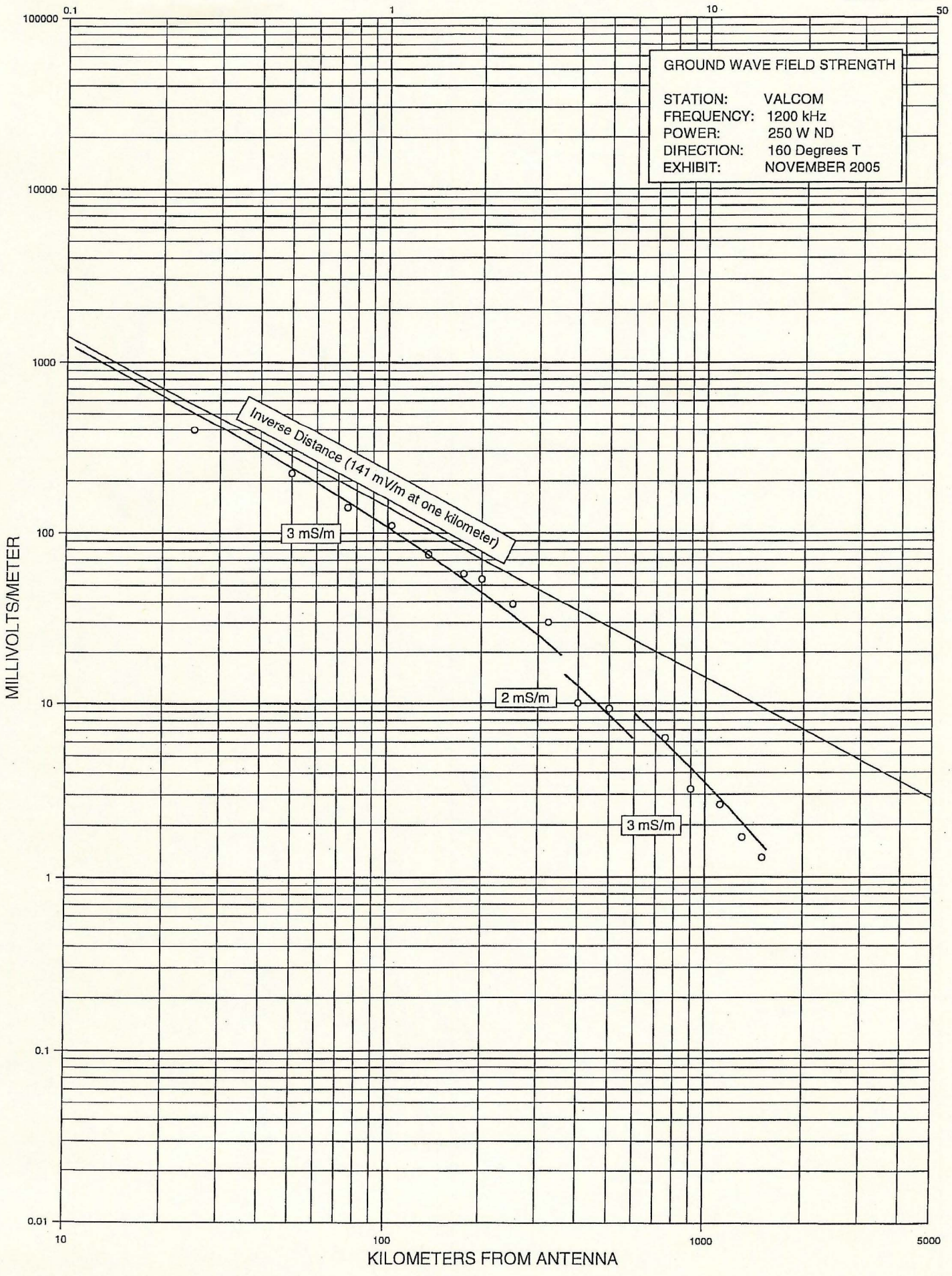
315 Degree Radial

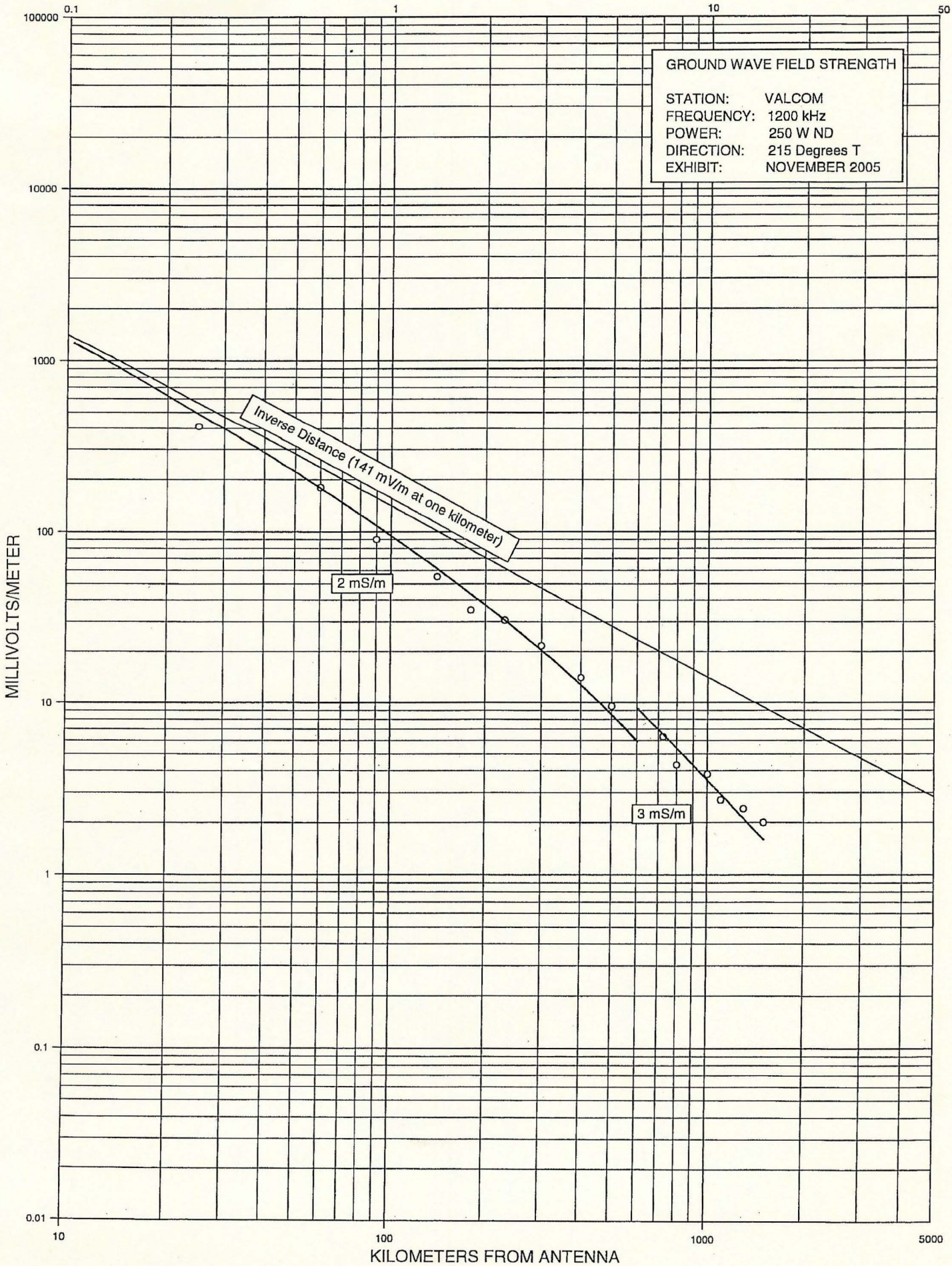
Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	11/23/05	1625	410
2	0.50	11/23/05	1615	189
3	0.75	11/23/05	1609	120
4	1.01	11/23/05	1558	93.0
5	1.23	11/23/05	1353	80.0
6	1.47	11/23/05	1359	69.0
7	1.75	11/23/05	1405	49.0
8	2.00	11/23/05	1412	37.5
9	2.48	11/23/05	1430	33.0
10	3.00	11/23/05	1435	22.2
11	3.90	11/23/05	1441	16.6
12	5.03	11/23/05	1449	6.60
13	6.00	11/23/05	1455	4.50
14	7.00	11/23/05	1504	4.60
15	8.00	11/23/05	1509	3.50
16	9.40	11/23/05	1515	3.00
17	11.60	11/23/05	1522	3.50
18	14.80	11/23/05	1531	2.10


KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
GROUND WAVE FIELD STRENGTH
STATION: VALCOM
FREQUENCY: 1200 kHz
POWER: 250 W ND
DIRECTION: 0 Degrees T
EXHIBIT: NOVEMBER 2005
Inverse Distance (141 mV/m at one kilometer)
3 mS/m
5 mS/m
MILLIVOLTS/METER
10
100
1000
5000
KILOMETERS FROM ANTENNA


KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
GROUND WAVE FIELD STRENGTH
STATION: VALCOM
FREQUENCY: 1200 kHz
POWER: 250 W ND
DIRECTION: 40 Degrees T
EXHIBIT: NOVEMBER 2005
Inverse Distance (141 mV/m at one kilometer)
3 mS/m
MILLIVOLTS/METER
10
100
1000
5000
KILOMETERS FROM ANTENNA


KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
MILLIVOLTS/METER
GROUND WAVE FIELD STRENGTH
STATION: VALCOM
FREQUENCY: 1200 kHz
POWER: 250 W ND
DIRECTION: 100 Degrees T
EXHIBIT: NOVEMBER 2005
Inverse Distance (141 mV/m at one kilometer)
2 mS/m
3 mS/m
10
100
1000
5000
KILOMETERS FROM ANTENNA


KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
MILLIVOLTS/METER
GROUND WAVE FIELD STRENGTH
STATION: VALCOM
FREQUENCY: 1200 kHz
POWER: 250 W ND
DIRECTION: 160 Degrees T
EXHIBIT: NOVEMBER 2005
Inverse Distance (141 mV/m at one kilometer)
3 mS/m
2 mS/m
3 mS/m
10
100
1000
5000
KILOMETERS FROM ANTENNA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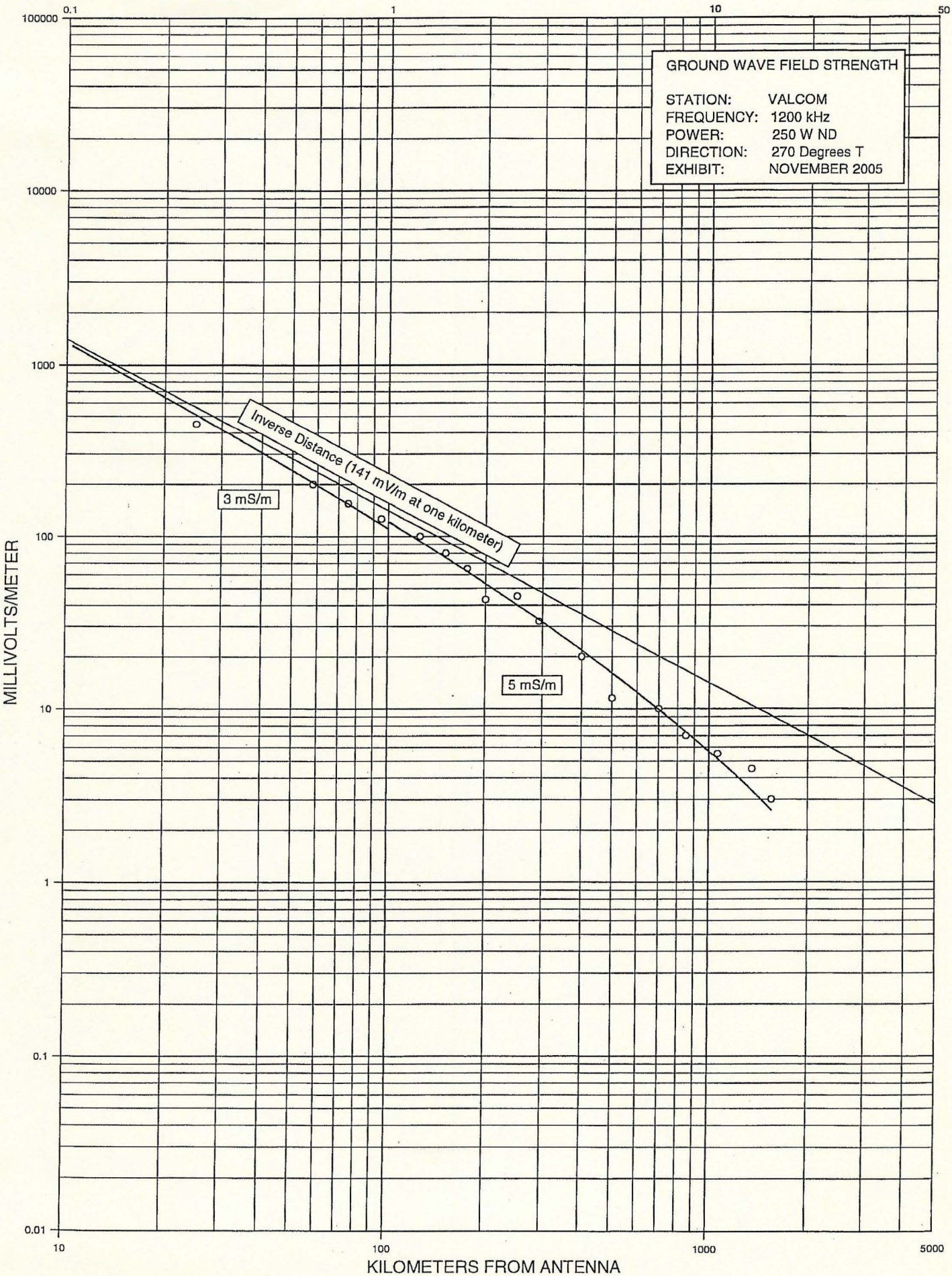
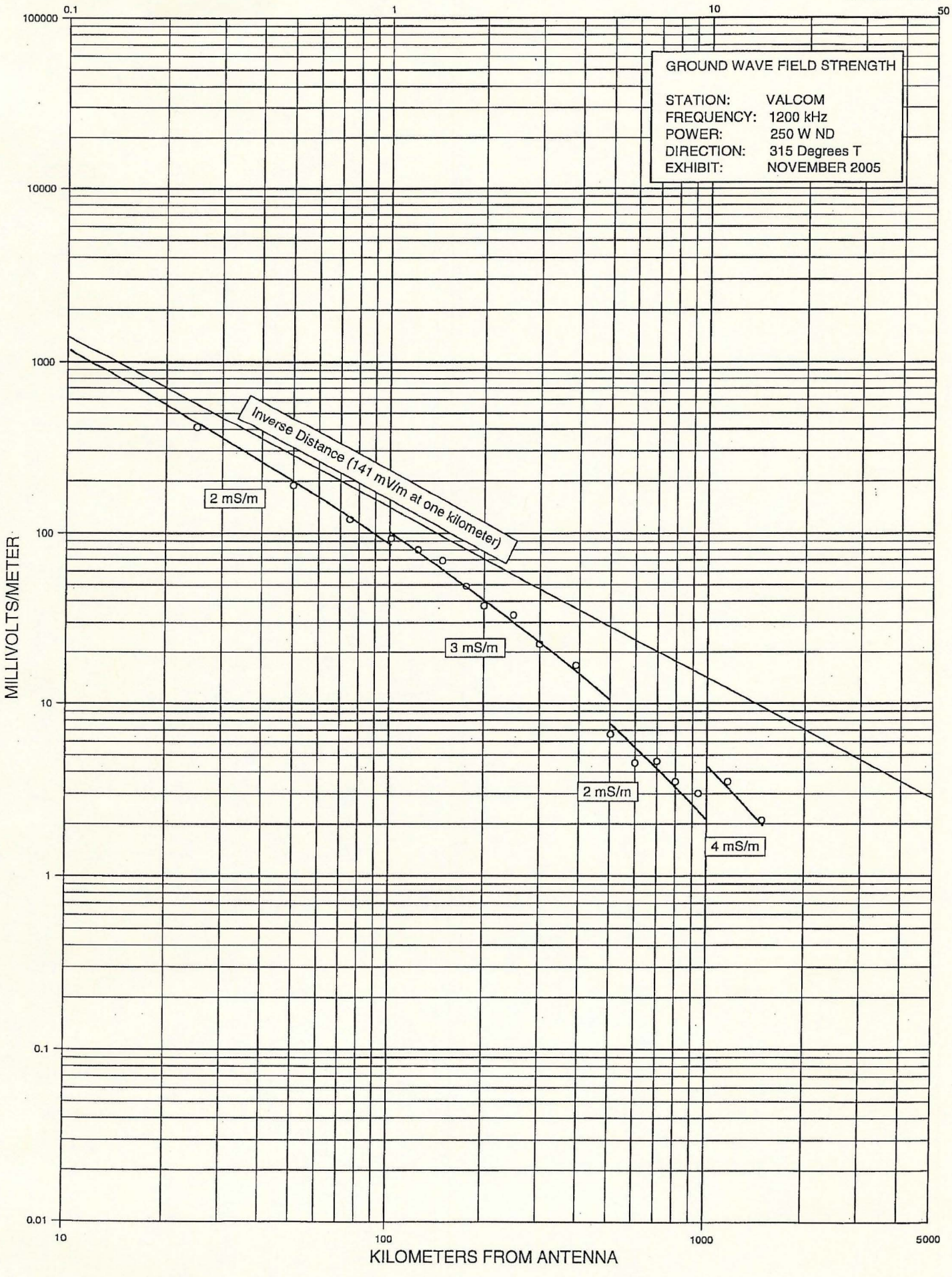
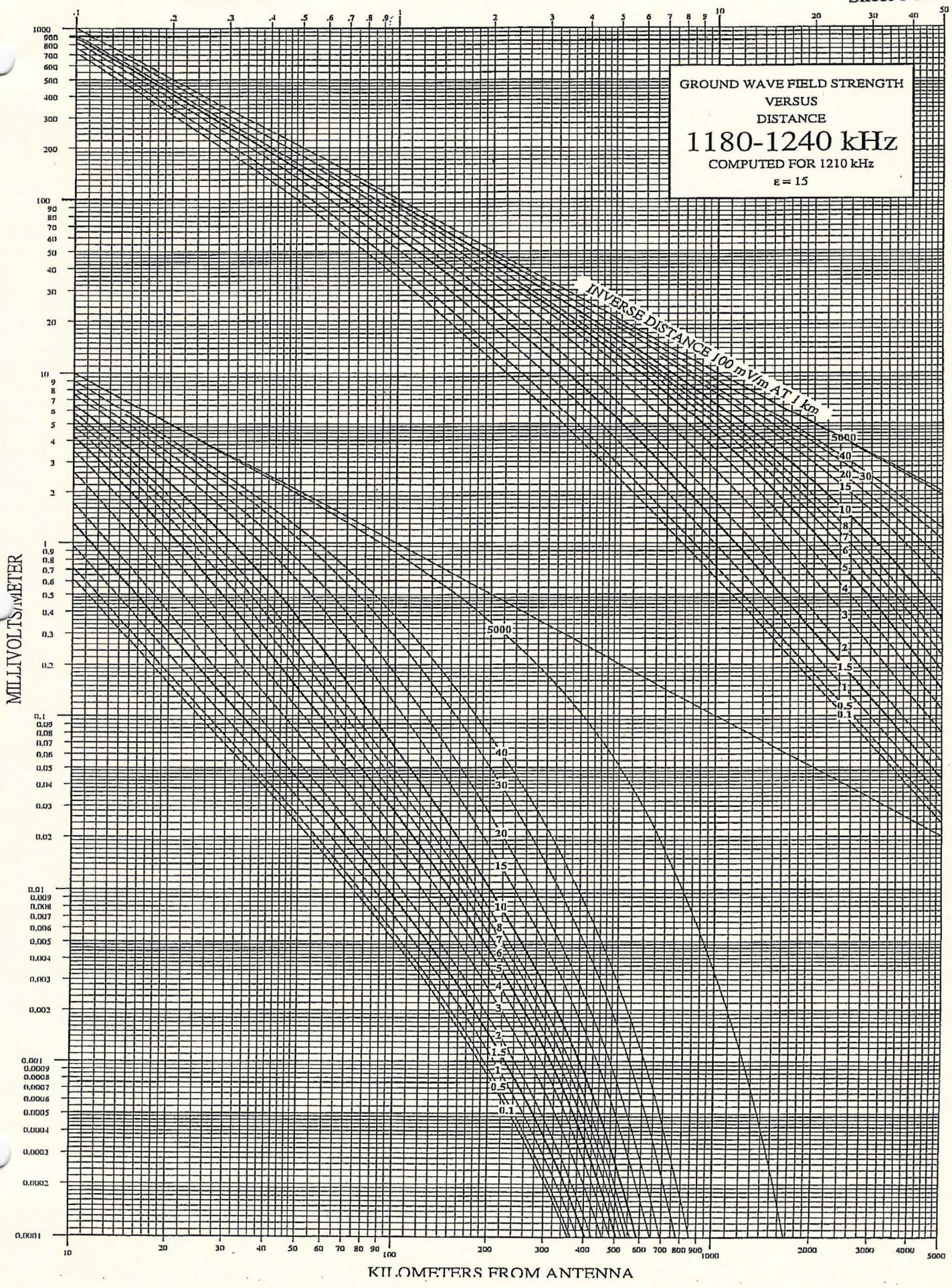
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
MILLIVOLTS/METER
GROUND WAVE FIELD STRENGTH
STATION: VALCOM
FREQUENCY: 1200 kHz
POWER: 250 W ND
DIRECTION: 215 Degrees T
EXHIBIT: NOVEMBER 2005
Inverse Distance (141 mV/m at one kilometer)
2 mS/m
3 mS/m
10
100
1000
5000
KILOMETERS FROM ANTENNA


KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
MILLIVOLTS/METER
GROUND WAVE FIELD STRENGTH
STATION: VALCOM
FREQUENCY: 1200 kHz
POWER: 250 W ND
DIRECTION: 270 Degrees T
EXHIBIT: NOVEMBER 2005
Inverse Distance (141 mV/m at one kilometer)
3 mS/m
5 mS/m
10
100
1000
5000
KILOMETERS FROM ANTENNA


KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
MILLIVOLTS/METER
GROUND WAVE FIELD STRENGTH
STATION: VALCOM
FREQUENCY: 1200 kHz
POWER: 250 W ND
DIRECTION: 315 Degrees T
EXHIBIT: NOVEMBER 2005
Inverse Distance (141 mV/m at one kilometer)
2 mS/m
3 mS/m
2 mS/m
4 mS/m
10
100
1000
5000
KILOMETERS FROM ANTENNA


KILOMETERS FROM ANTENNA
GROUND WAVE FIELD STRENGTH
VERSUS
DISTANCE
1180-1240 kHz
COMPUTED FOR 1210 kHz
ε = 15
INVERSE DISTANCE 100 mV/m AT 1 km
MILLIVOLTS/METER
KILOMETERS FROM ANTENNA

Valcom AM Broadcast Antenna
(85 foot with Valcosphere)
Operating Frequency: 1390 kHz

0 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	10/30/06	1634	510
2	0.45	10/30/06	1628	200
3	0.62	10/30/06	1615	142
4	0.75	10/30/06	1604	115
5	1.00	10/30/06	1455	82.0
6	1.25	10/30/06	1458	77.0
7	1.50	10/30/06	1500	58.0
8	1.80	10/30/06	1504	49.0
9	2.25	10/30/06	1506	32.0
10	2.50	10/30/06	1509	17.0
11	3.00	10/30/06	1533	22.0
12	4.00	10/30/06	1515	14.0
13	5.00	10/30/06	1520	9.50
14	7.00	10/30/06	1525	5.60
15	8.00	10/30/06	1528	3.50
16	9.50	10/30/06	1531	3.10
17	11.00	10/30/06	1533	3.00
18	13.00	10/30/06	1538	2.70
19	15.00	10/30/06	1542	1.80

Valcom AM Broadcast Antenna
(85 foot with Valcosphere)
Operating Frequency: 1390 kHz

40 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	11/13/06	1510	455
2	0.50	11/13/06	1500	185
3	0.75	11/13/06	1455	132
4	1.10	11/13/06	1447	168
5	1.48	11/13/06	1438	47.0
6	1.76	11/13/06	1433	34.0
7	2.00	11/13/06	1430	40.0
8	3.00	11/13/06	1427	17.0
9	4.00	11/13/06	1425	10.0
10	5.00	11/13/06	1422	8.60
11	6.00	11/13/06	1420	5.00
12	7.00	11/13/06	1417	3.70
13	9.10	11/13/06	1413	3.50
14	11.00	11/13/06	1408	2.10
15	13.00	11/13/06	1404	1.00
16	14.70	11/13/06	1402	0.90

Valcom AM Broadcast Antenna
(85 foot with Valcosphere)
Operating Frequency: 1390 kHz

100 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.26	11/13/06	1520	475
2	0.50	11/13/06	1525	190
3	0.75	11/13/06	1254	135
4	1.00	11/13/06	1257	125
5	1.27	11/13/06	1301	100
6	1.50	11/13/06	1304	74.0
7	1.79	11/13/06	1308	50.0
8	2.21	11/13/06	1312	25.0
9	2.77	11/13/06	1314	25.0
10	4.00	11/13/06	1317	14.0
11	6.00	11/13/06	1321	8.20
12	7.02	11/13/06	1325	6.20
13	9.00	11/13/06	1328	3.50
14	11.50	11/13/06	1332	2.10
15	13.00	11/13/06	1335	1.60
16	14.20	11/13/06	1338	1.30

Valcom AM Broadcast Antenna
(85 foot with Valcosphere)
Operating Frequency: 1390 kHz

160 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	11/1/06	1506	410
2	0.50	11/1/06	1509	240
3	0.75	11/1/06	1238	155
4	1.03	11/1/06	1241	112
5	1.35	11/1/06	1244	90.0
6	1.75	11/1/06	1247	68.0
7	2.00	11/1/06	1249	63.0
8	2.50	11/1/06	1251	36.0
9	3.23	11/1/06	1253	27.0
10	4.00	11/1/06	1256	10.0
11	5.00	11/1/06	1258	11.0
12	7.50	11/1/06	1306	7.80
13	9.00	11/1/06	1309	2.50
14	11.10	11/1/06	1312	2.30
15	13.00	11/1/06	1315	2.00
16	15.00	11/1/06	1320	1.20

Valcom AM Broadcast Antenna
(85 foot with Valcosphere)
Operating Frequency: 1390 kHz

215 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	11/1/06	1500	400
2	0.60	11/1/06	1454	180
3	0.90	11/1/06	1450	110
4	1.40	11/1/06	1447	67.0
5	1.80	11/1/06	1445	37.0
6	2.30	11/1/06	1443	33.0
7	3.00	11/1/06	1441	23.0
8	4.00	11/1/06	1438	14.0
9	5.00	11/1/06	1435	9.20
10	7.25	11/1/06	1430	5.20
11	8.00	11/1/06	1427	3.80
12	10.00	11/1/06	1423	2.80
13	11.00	11/1/06	1420	2.50
14	13.00	11/1/06	1414	1.80
15	15.00	11/1/06	1408	1.60

Valcom AM Broadcast Antenna
(85 foot with Valcosphere)
Operating Frequency: 1390 kHz

270 Degree Radial

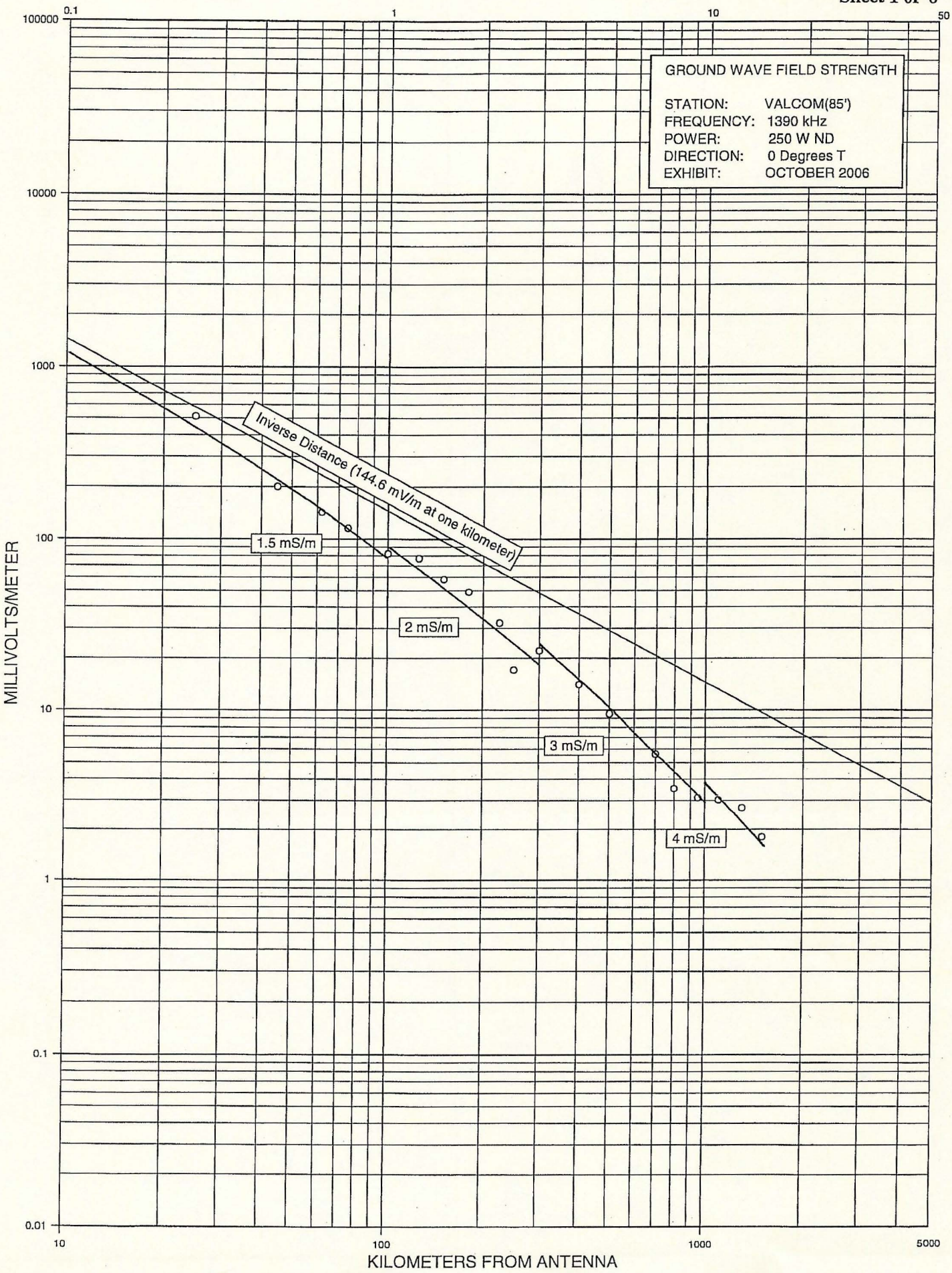
Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	10/31/06	1225	525
2	0.58	10/31/06	1228	330
3	0.75	10/31/06	1232	180
4	0.95	10/31/06	1235	145
5	1.25	10/31/06	1247	111
6	1.50	10/31/06	1255	100
7	1.75	10/31/06	1300	82.0
8	2.00	10/31/06	1303	43.0
9	2.50	10/31/06	1306	46.0
10	2.92	10/31/06	1309	32.0
11	4.00	10/31/06	1312	22.0
12	5.00	10/31/06	1317	10.0
13	7.00	10/31/06	1322	10.0
14	8.50	10/31/06	1328	6.20
15	10.60	10/31/06	1333	5.40
16	13.50	10/31/06	1338	3.50
17	15.50	10/31/06	1342	2.40

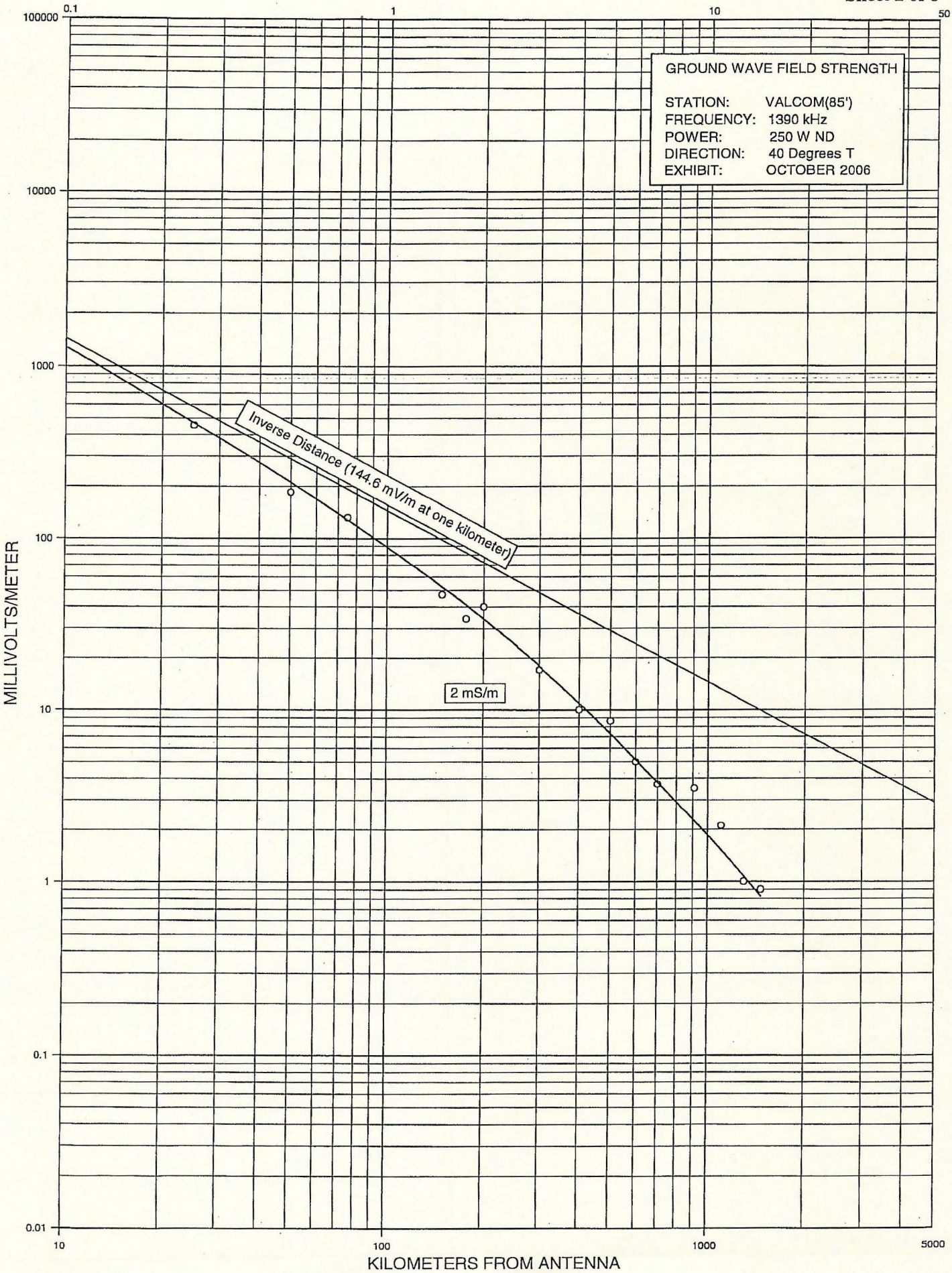
Valcom AM Broadcast Antenna
(85 foot with Valcosphere)
Operating Frequency: 1390 kHz

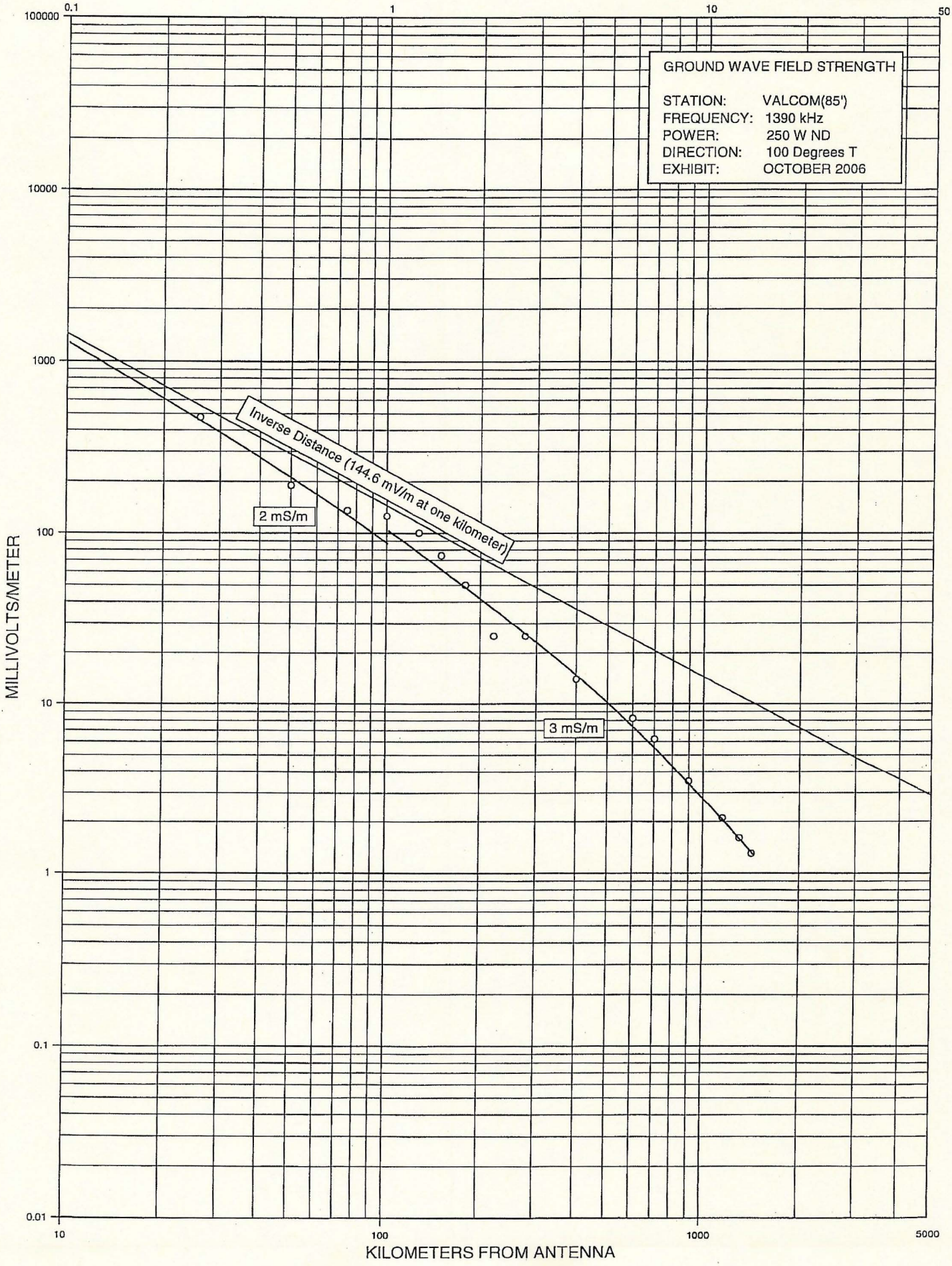
315 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	10/31/06	1543	525
2	0.50	10/31/06	1539	225
3	0.75	10/31/06	1530	135
4	1.01	10/31/06	1520	100
5	1.23	10/31/06	1509	80.0
6	1.47	10/31/06	1507	74.0
7	1.75	10/31/06	1505	50.0
8	2.00	10/31/06	1502	45.0
9	2.48	10/31/06	1457	38.0
10	3.00	10/31/06	1454	22.0
11	3.90	10/31/06	1451	14.0
12	5.03	10/31/06	1446	12.0
13	6.00	10/31/06	1442	5.80
14	7.00	10/31/06	1439	5.40
15	8.00	10/31/06	1434	1.70
16	9.40	10/31/06	1407	2.40
17	11.60	10/31/06	1402	2.40
18	14.80	10/31/06	1354	1.30

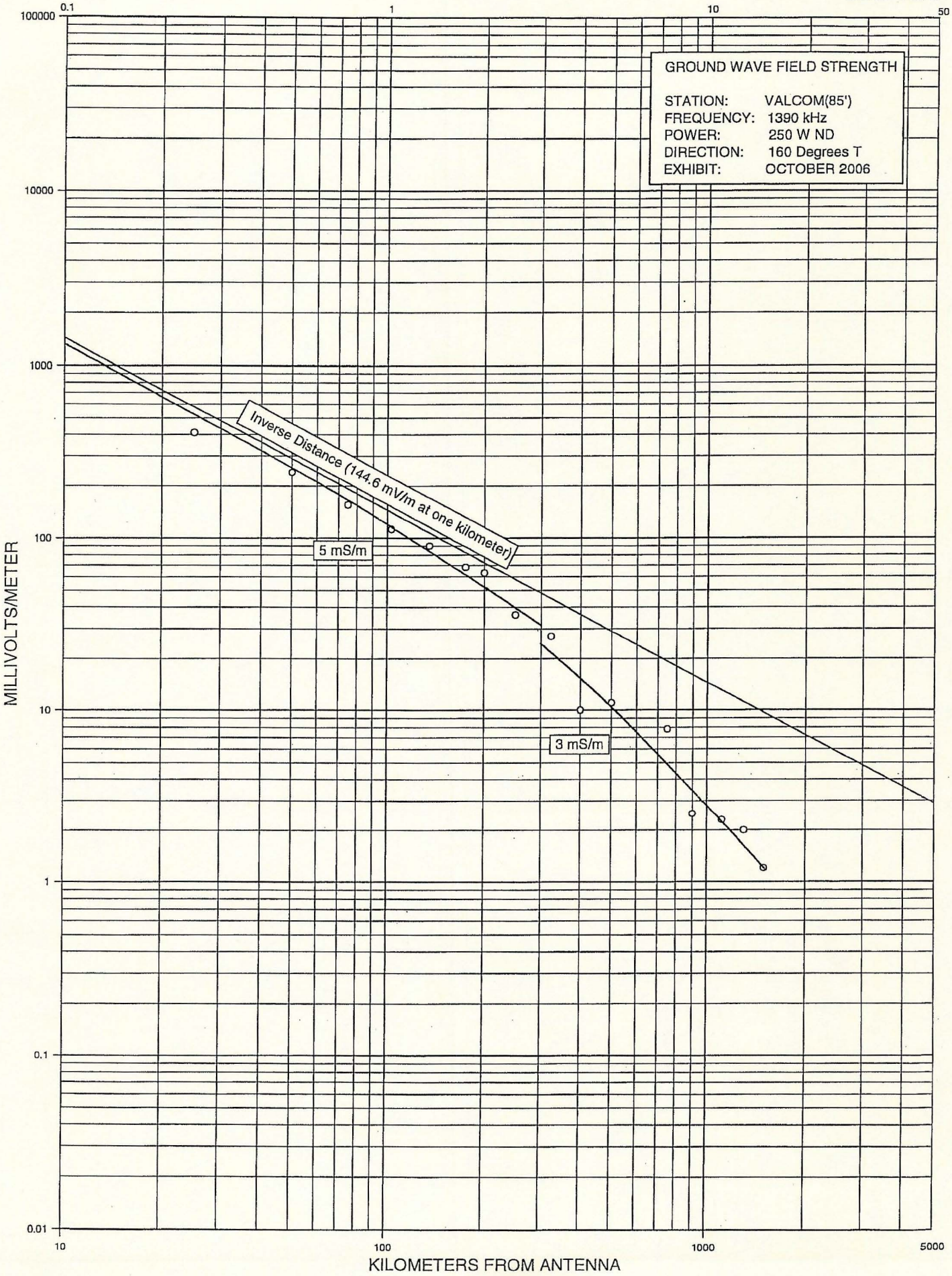
KILOMETERS FROM ANTENNA

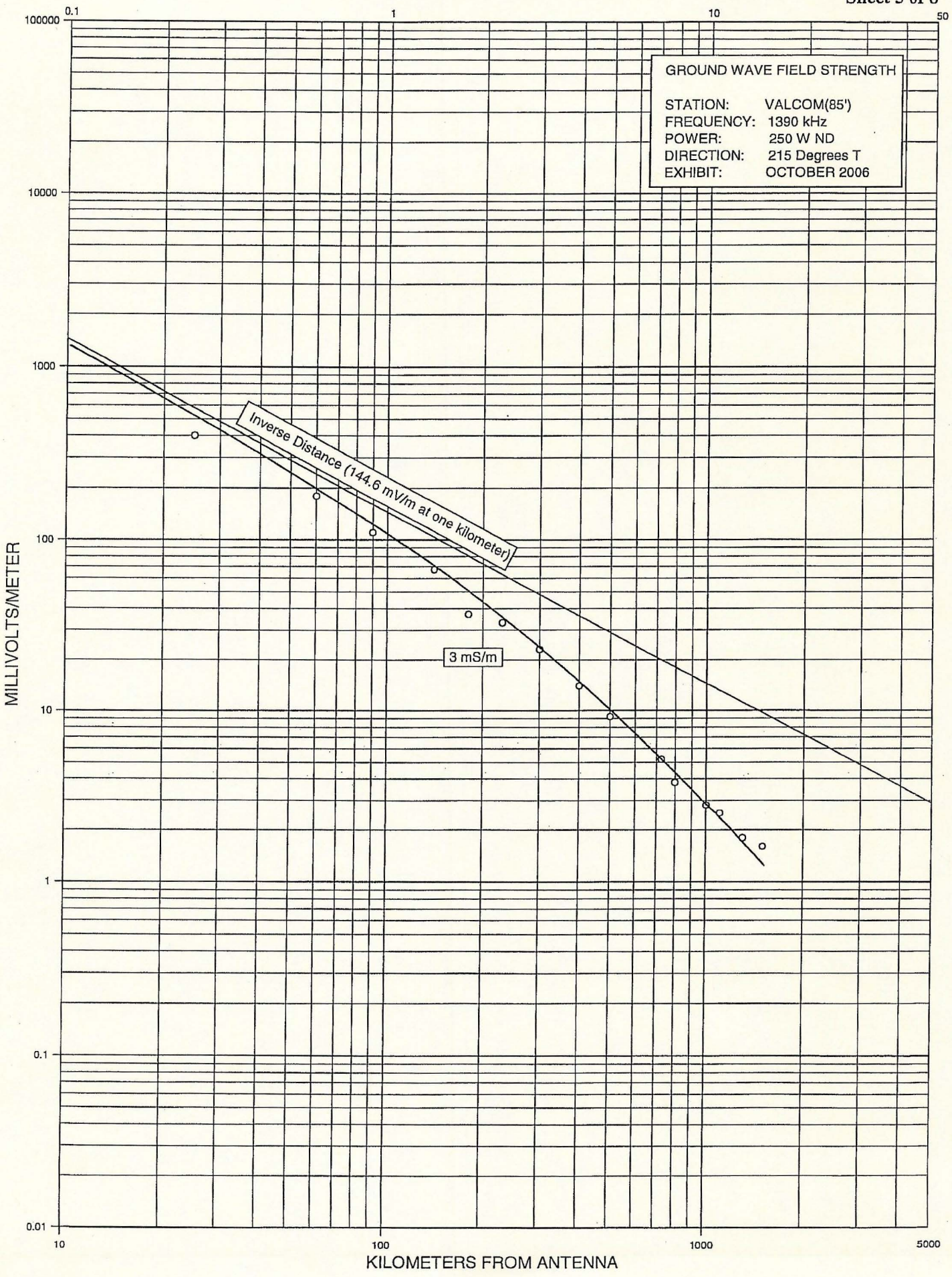


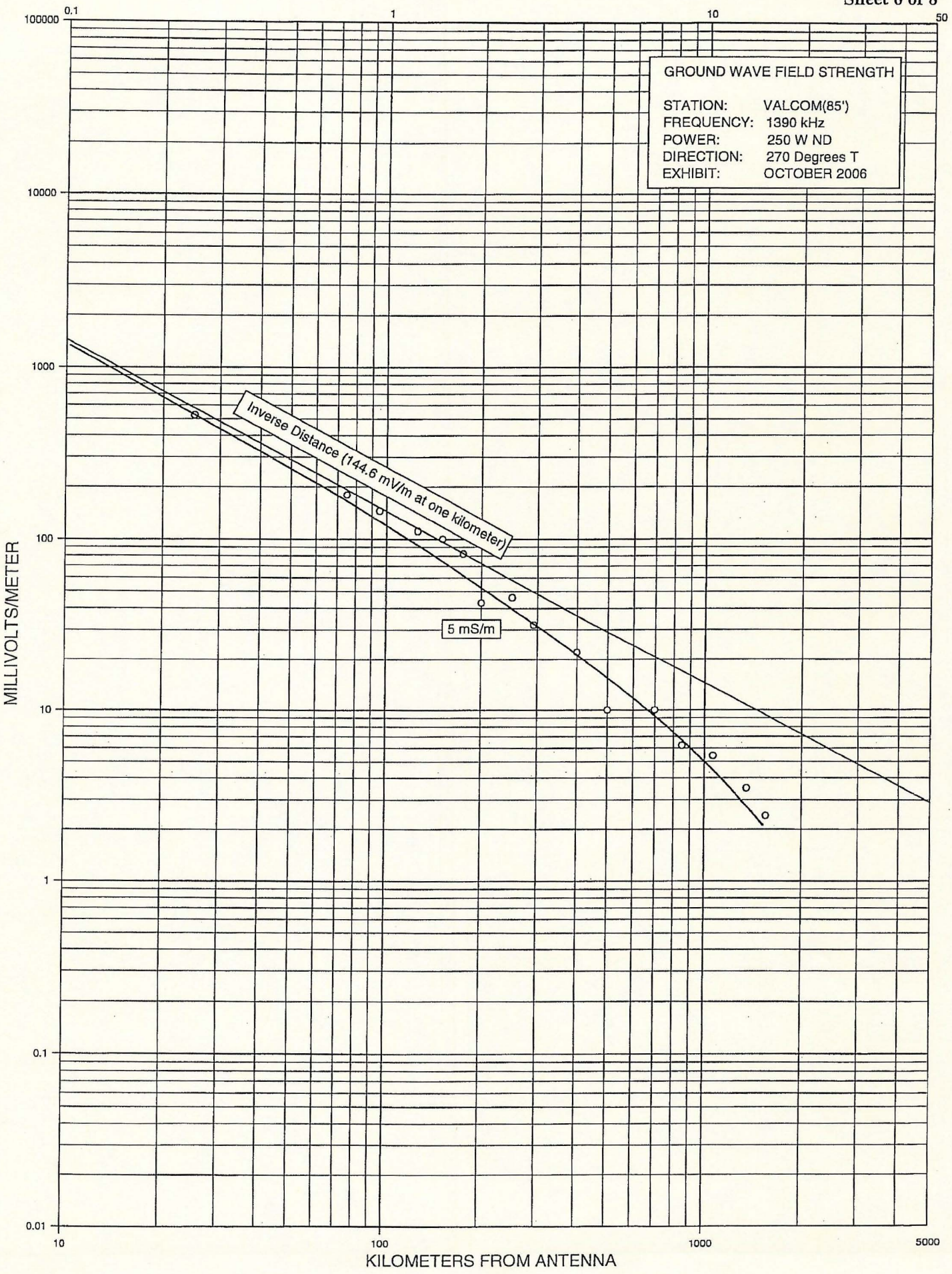

KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
GROUND WAVE FIELD STRENGTH
STATION: VALCOM(85')
FREQUENCY: 1390 kHz
POWER: 250 W ND
DIRECTION: 40 Degrees T
EXHIBIT: OCTOBER 2006
Inverse Distance (144.6 mV/m at one kilometer)
2 mS/m
MILLIVOLTS/METER
10
100
1000
5000
KILOMETERS FROM ANTENNA

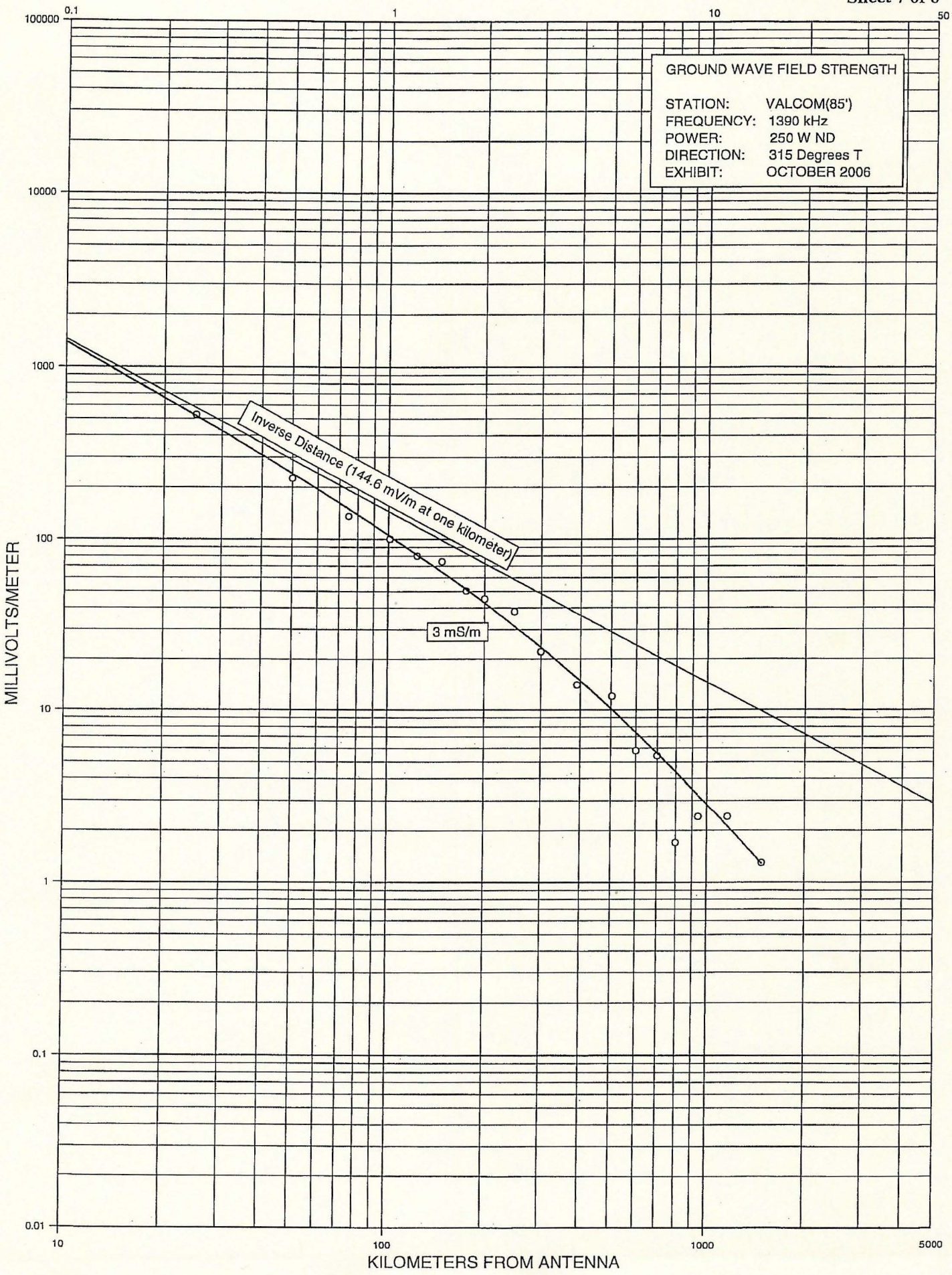

KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
MILLIVOLTS/METER
GROUND WAVE FIELD STRENGTH
STATION: VALCOM(85')
FREQUENCY: 1390 kHz
POWER: 250 W ND
DIRECTION: 100 Degrees T
EXHIBIT: OCTOBER 2006
Inverse Distance (144.6 mV/m at one kilometer)
2 mS/m
3 mS/m
10
100
1000
5000
KILOMETERS FROM ANTENNA

KILOMETERS FROM ANTENNA

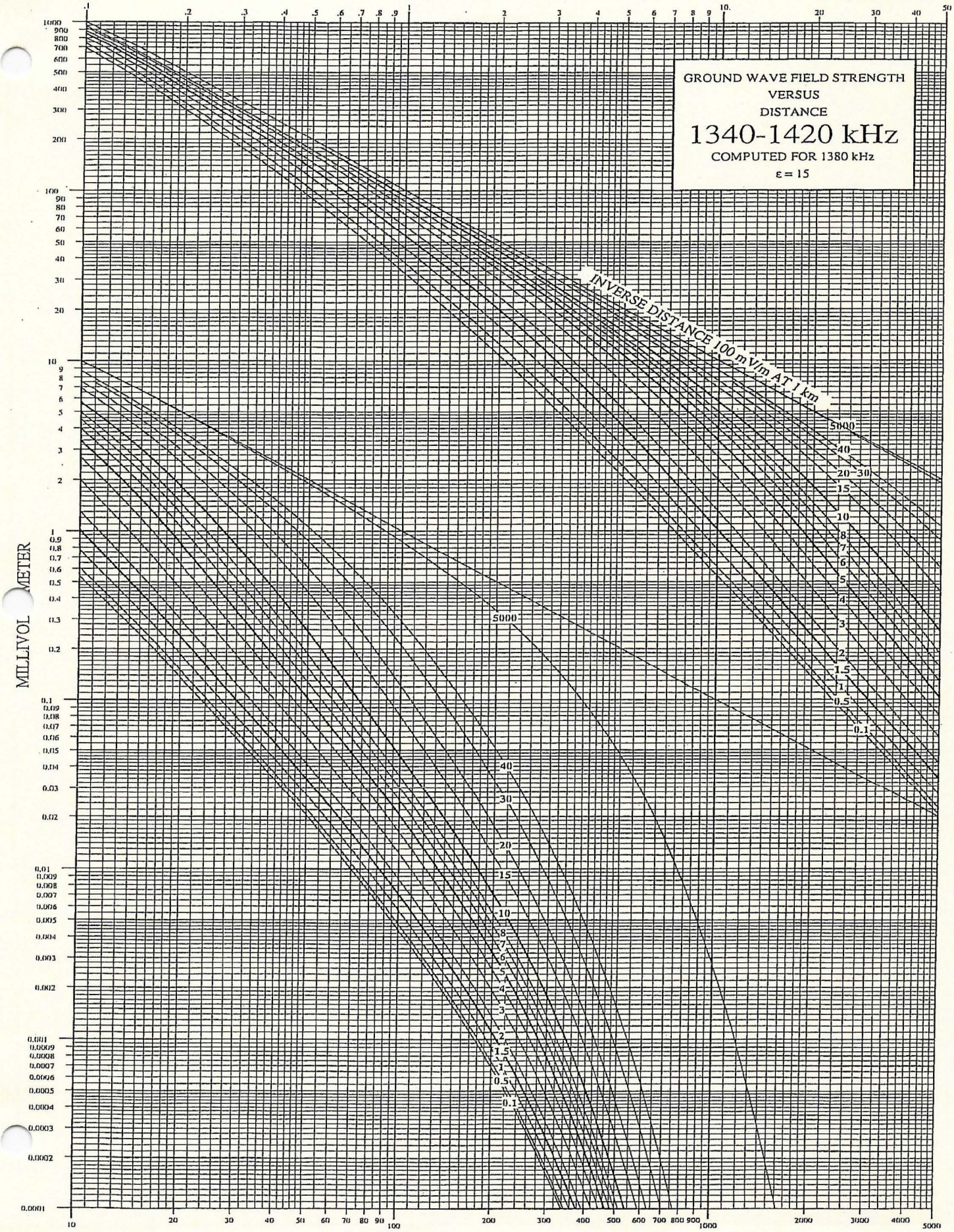



KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
MILLIVOLTS/METER
GROUND WAVE FIELD STRENGTH
STATION: VALCOM(85')
FREQUENCY: 1390 kHz
POWER: 250 W ND
DIRECTION: 215 Degrees T
EXHIBIT: OCTOBER 2006
Inverse Distance (144.6 mV/m at one kilometer)
3 mS/m
10
100
1000
5000
KILOMETERS FROM ANTENNA


KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
MILLIVOLTS/METER
GROUND WAVE FIELD STRENGTH
STATION: VALCOM(85')
FREQUENCY: 1390 kHz
POWER: 250 W ND
DIRECTION: 270 Degrees T
EXHIBIT: OCTOBER 2006
Inverse Distance (144.6 mV/m at one kilometer)
5 mS/m
10
100
1000
5000
KILOMETERS FROM ANTENNA


KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
GROUND WAVE FIELD STRENGTH
STATION: VALCOM(85')
FREQUENCY: 1390 kHz
POWER: 250 W ND
DIRECTION: 315 Degrees T
EXHIBIT: OCTOBER 2006
Inverse Distance (144.6 mV/m at one kilometer)
3 mS/m
MILLIVOLTS/METER
10
100
1000
5000
KILOMETERS FROM ANTENNA

KILOMETERS FROM ANTENNA



GRAPH 17

Valcom AM Broadcast Antenna

(75 foot with Valcosphere)
Operating Frequency: 1390 kHz

0 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	10/26/06	1625	440
2	0.45	10/26/06	1635	190
3	0.62	10/26/06	1304	135
4	0.75	10/26/06	1313	110
5	1.00	10/26/06	1320	80.0
6	1.25	10/26/06	1325	52.0
7	1.50	10/26/06	1330	39.0
8	1.80	10/26/06	1333	32.0
9	2.25	10/26/06	1336	24.0
10	2.50	10/26/06	1338	18.0
11	3.00	10/26/06	1342	15.0
12	4.00	10/26/06	1411	12.5
13	5.00	10/26/06	1415	10.5
14	7.00	10/26/06	1420	5.50
15	8.00	10/26/06	1427	4.10
16	9.50	10/26/06	1431	3.50
17	11.00	10/26/06	1434	3.50
18	13.00	10/26/06	1439	2.80
19	15.00	10/26/06	1443	1.50

Valcom AM Broadcast Antenna
(75 foot with Valcosphere)
Operating Frequency: 1390 kHz

40 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	10/24/06	1530	450
2	0.50	10/24/06	1525	180
3	0.75	10/24/06	1518	125
4	1.10	10/24/06	1510	72.0
5	1.48	10/24/06	1500	45.0
6	1.76	10/24/06	1454	39.0
7	2.00	10/24/06	1450	39.0
8	3.00	10/24/06	1447	18.5
9	4.00	10/24/06	1443	8.70
10	5.00	10/24/06	1441	6.30
11	6.00	10/24/06	1438	4.30
12	7.00	10/24/06	1435	3.50
13	9.10	10/24/06	1432	2.90
14	11.00	10/24/06	1427	1.80
15	13.00	10/24/06	1422	1.00
16	14.70	10/24/06	1417	0.70

Valcom AM Broadcast Antenna
(75 foot with Valcosphere)
Operating Frequency: 1390 kHz

100 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.26	10/24/06	1559	485
2	0.50	10/24/06	1555	190
3	0.75	10/24/06	1550	132
4	1.00	10/24/06	1244	115
5	1.27	10/24/06	1252	90.0
6	1.50	10/24/06	1248	72.0
7	1.79	10/24/06	1255	47.0
8	2.21	10/24/06	1310	36.0
9	2.77	10/24/06	1314	25.0
10	4.00	10/24/06	1325	13.5
11	6.00	10/24/06	1333	8.00
12	7.02	10/24/06	1338	5.50
13	9.00	10/24/06	1343	3.50
14	11.50	10/24/06	1347	2.15
15	13.00	10/24/06	1350	1.40
16	14.20	10/24/06	1350	1.00

Valcom AM Broadcast Antenna
(75 foot with Valcosphere)
Operating Frequency: 1390 kHz

160 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	10/23/06	1300	420
2	0.50	10/23/06	1305	270
3	0.75	10/23/06	1310	160
4	1.03	10/23/06	1319	125
5	1.35	10/23/06	1322	79.0
6	1.75	10/23/06	1325	68.0
7	2.00	10/23/06	1328	58.0
8	2.50	10/23/06	1332	39.0
9	3.23	10/23/06	1334	30.0
10	4.00	10/23/06	1338	12.5
11	5.00	10/23/06	1341	13.0
12	7.50	10/23/06	1350	8.40
13	9.00	10/23/06	1357	2.70
14	11.10	10/23/06	1402	1.60
15	13.00	10/23/06	1407	1.70
16	15.00	10/23/06	1413	1.20

Valcom AM Broadcast Antenna
(75 foot with Valcosphere)
Operating Frequency: 1390 kHz

215 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	10/23/06	1600	390
2	0.60	10/23/06	1548	190
3	0.90	10/23/06	1536	100
4	1.40	10/23/06	1533	72.0
5	1.80	10/23/06	1528	35.0
6	2.30	10/23/06	1523	28.0
7	3.00	10/23/06	1520	24.0
8	4.00	10/23/06	1515	14.0
9	5.00	10/23/06	1510	9.60
10	7.25	10/23/06	1505	6.20
11	8.00	10/23/06	1500	4.20
12	10.00	10/23/06	1455	3.30
13	11.00	10/23/06	1450	3.20
14	13.00	10/23/06	1444	1.70
15	15.00	10/23/06	1436	1.70

Valcom AM Broadcast Antenna
(75 foot with Valcosphere)
Operating Frequency: 1390 kHz

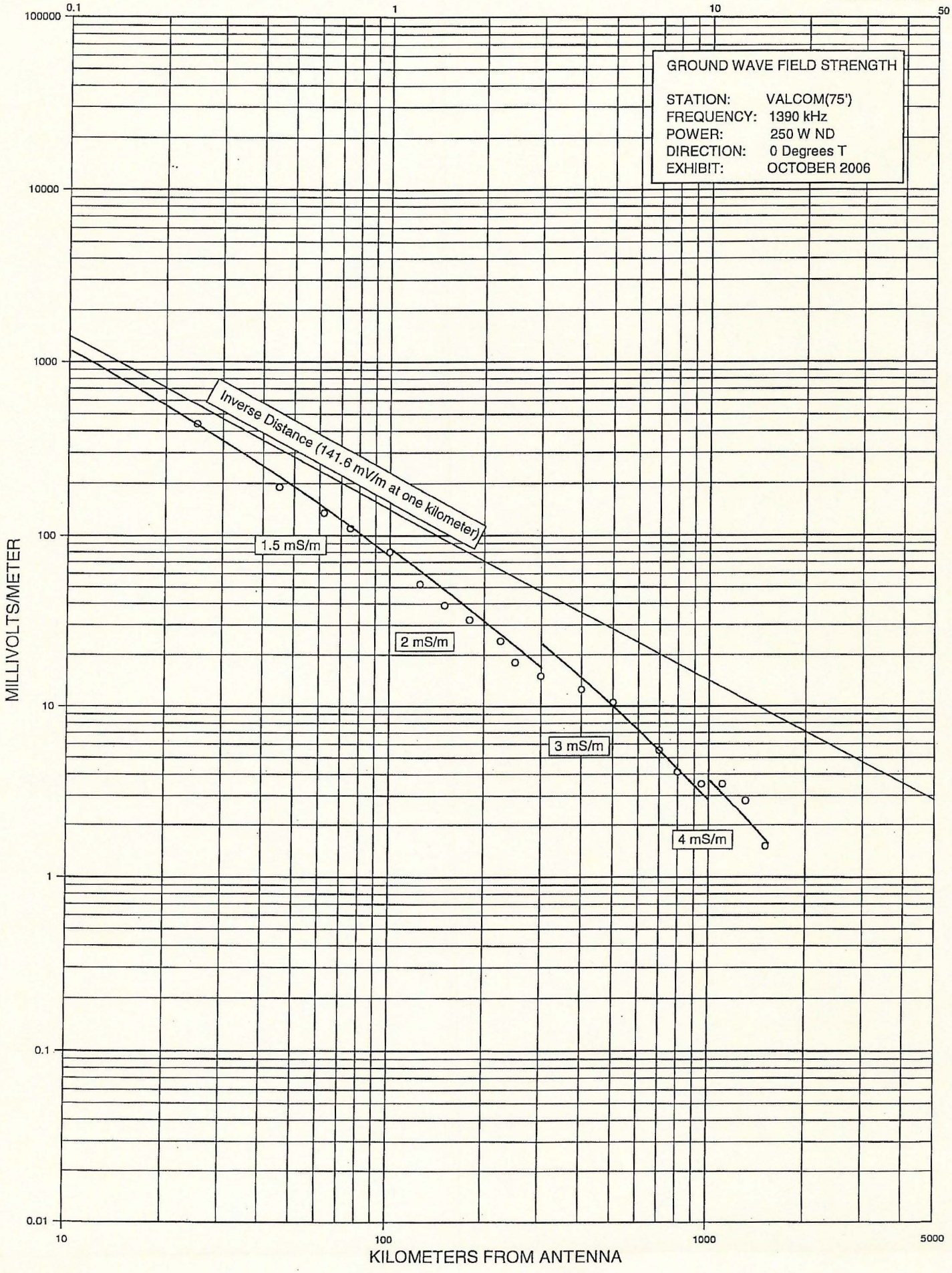
270 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	10/26/06	1610	560
2	0.58	10/26/06	1606	240
3	0.75	10/26/06	1603	190
4	0.95	10/26/06	1559	140
5	1.25	10/26/06	1555	110
6	1.50	10/26/06	1552	90.0
7	1.75	10/26/06	1548	80.0
8	2.00	10/26/06	1546	47.0
9	2.50	10/26/06	1543	52.0
10	2.92	10/26/06	1540	31.0
11	4.00	10/26/06	1538	24.0
12	5.00	10/26/06	1535	12.0
13	7.00	10/26/06	1530	9.90
14	8.50	10/26/06	1527	6.20
15	10.60	10/26/06	1522	4.50
16	13.50	10/26/06	1516	3.50
17	15.50	10/26/06	1509	2.60

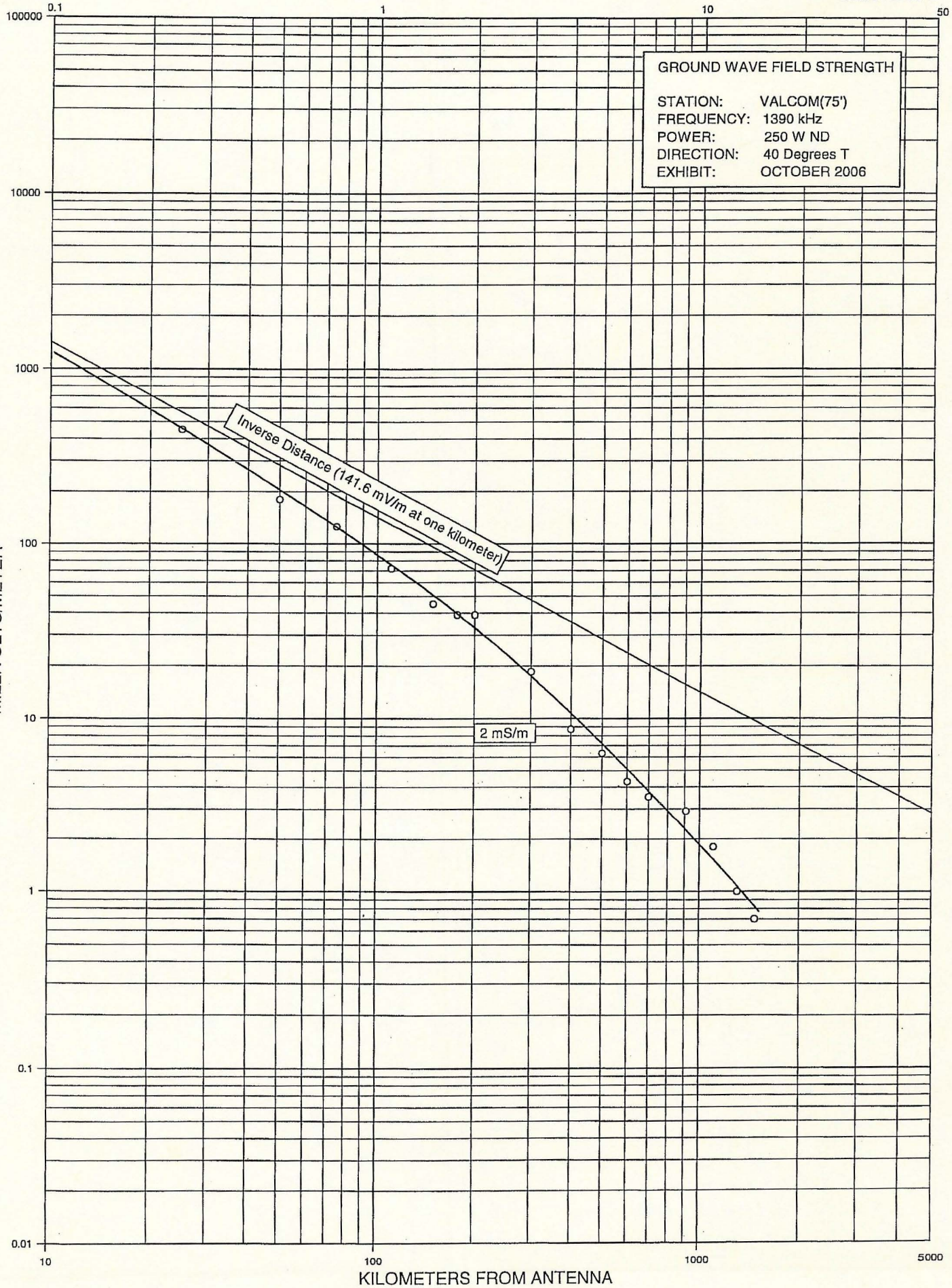
Valcom AM Broadcast Antenna
(75 foot with Valcosphere)
Operating Frequency: 1390 kHz

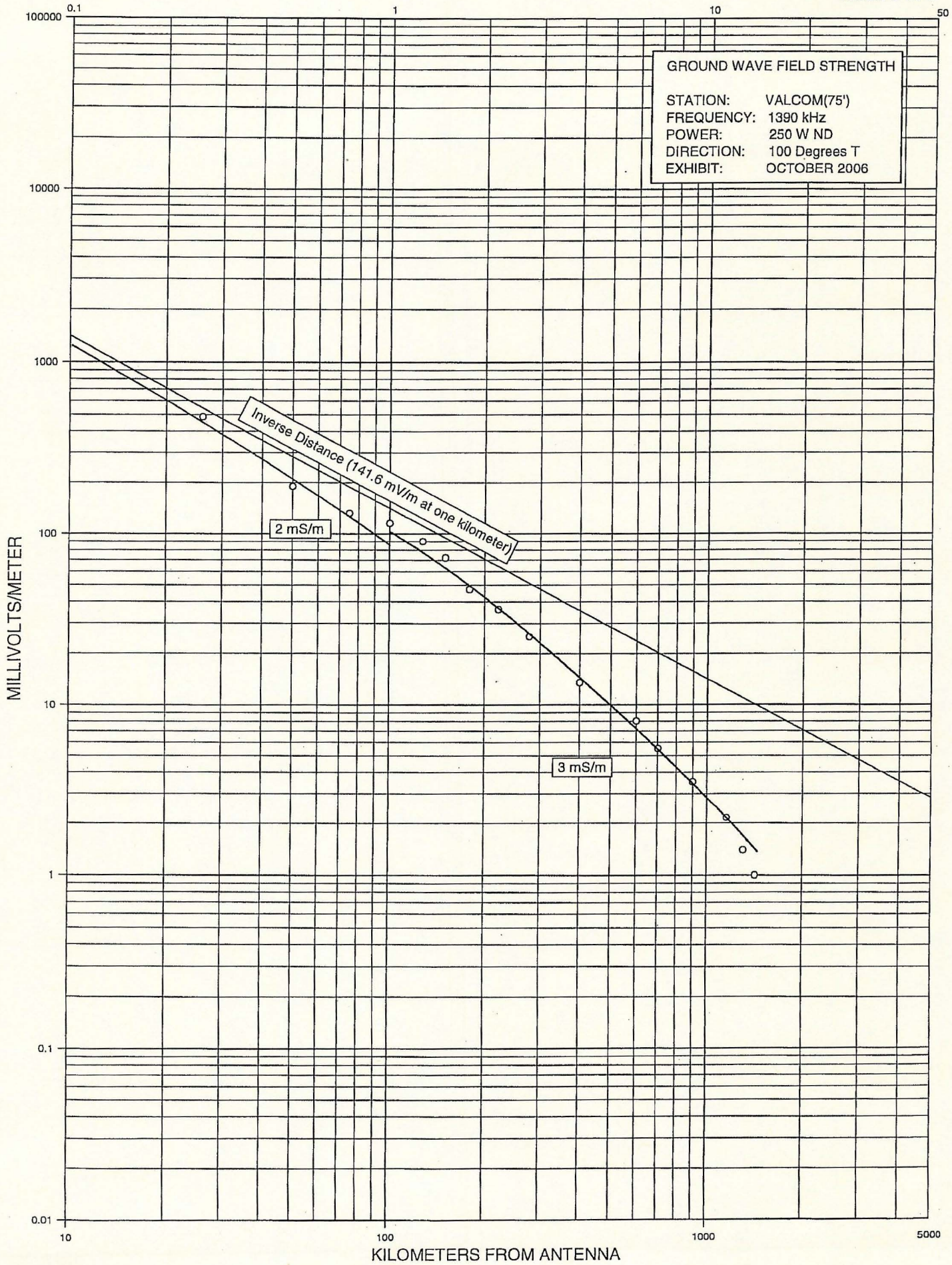
315 Degree Radial

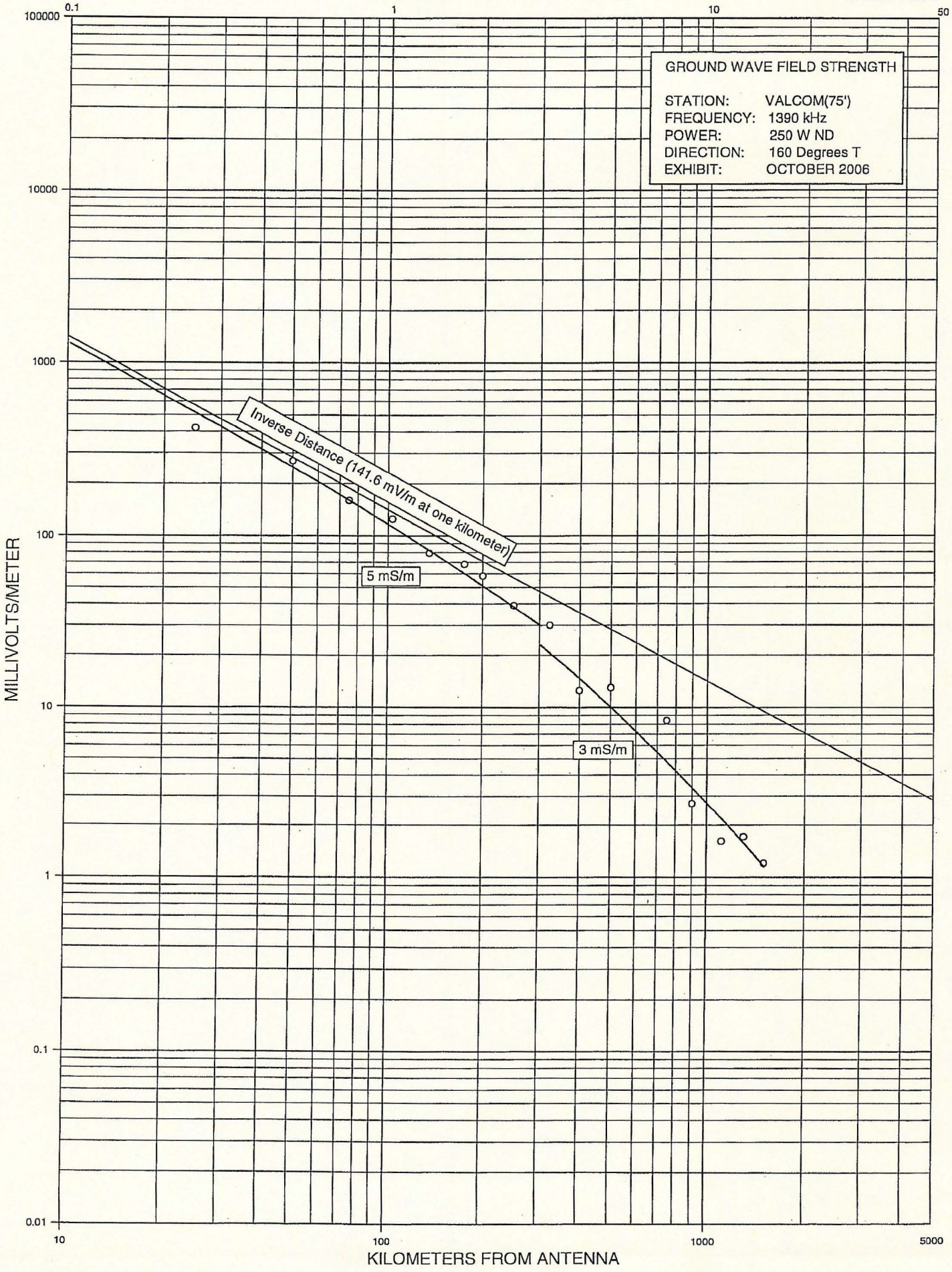
Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	10/20/06	1619	540
2	0.50	10/20/06	1613	235
3	0.75	10/20/06	1604	140
4	1.01	10/20/06	1517	100
5	1.23	10/20/06	1503	84.0
6	1.47	10/20/06	1459	76.0
7	1.75	10/20/06	1546	51.0
8	2.00	10/20/06	1451	47.0
9	2.48	10/20/06	1448	42.0
10	3.00	10/20/06	1438	23.0
11	3.90	10/20/06	1434	10.5
12	5.03	10/20/06	1425	9.60
13	6.00	10/20/06	1418	8.00
14	7.00	10/20/06	1415	7.00
15	8.00	10/20/06	1410	5.00
16	9.40	10/20/06	1405	2.50
17	11.60	10/20/06	1358	3.30
18	14.80	10/20/06	1350	1.80

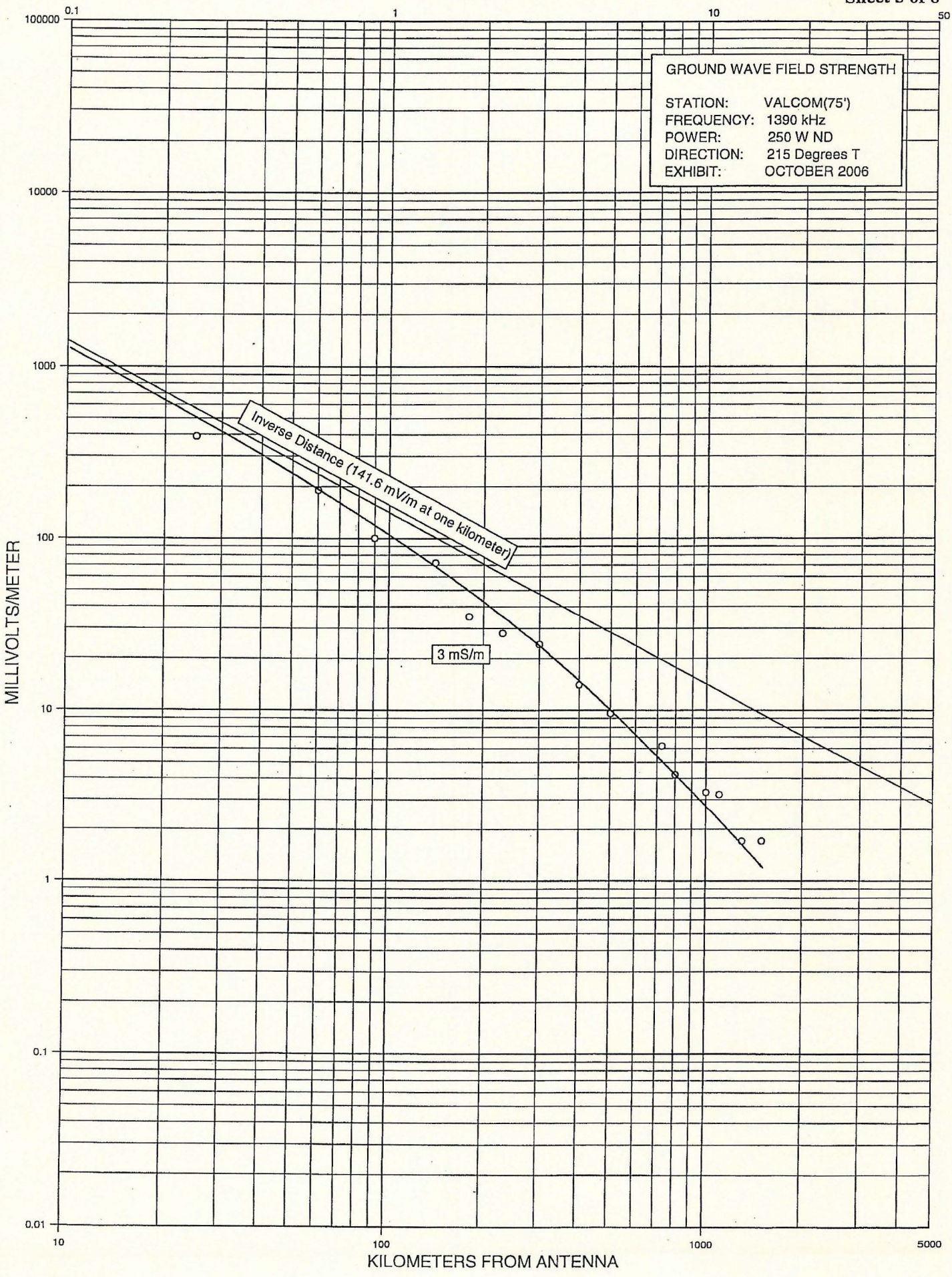

KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
MILLIVOLTS/METER
GROUND WAVE FIELD STRENGTH
STATION: VALCOM(75')
FREQUENCY: 1390 kHz
POWER: 250 W ND
DIRECTION: 0 Degrees T
EXHIBIT: OCTOBER 2006
Inverse Distance (141.6 mV/m at one kilometer)
1.5 mS/m
2 mS/m
3 mS/m
4 mS/m
10
100
1000
5000
KILOMETERS FROM ANTENNA

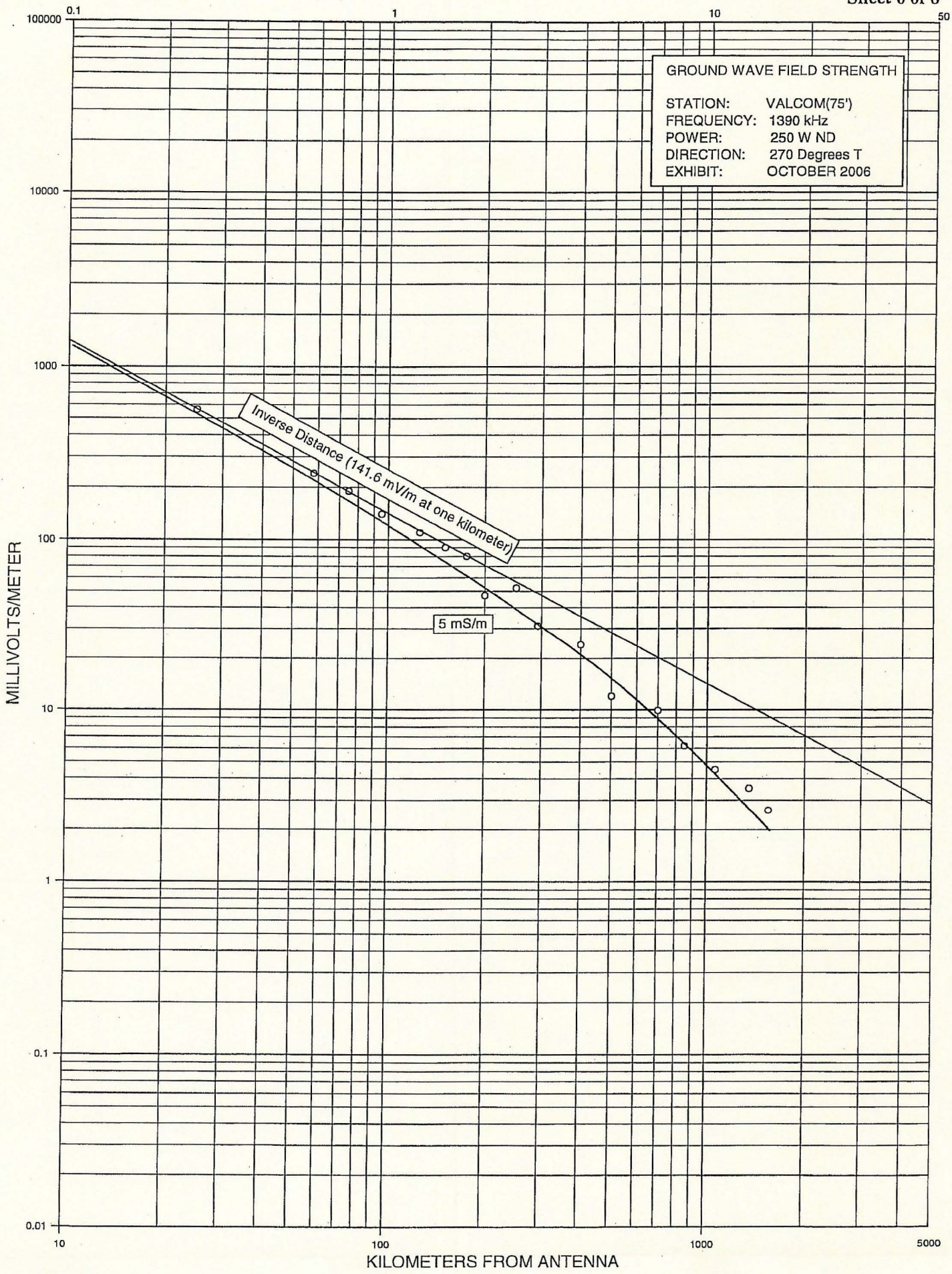
KILOMETERS FROM ANTENNA

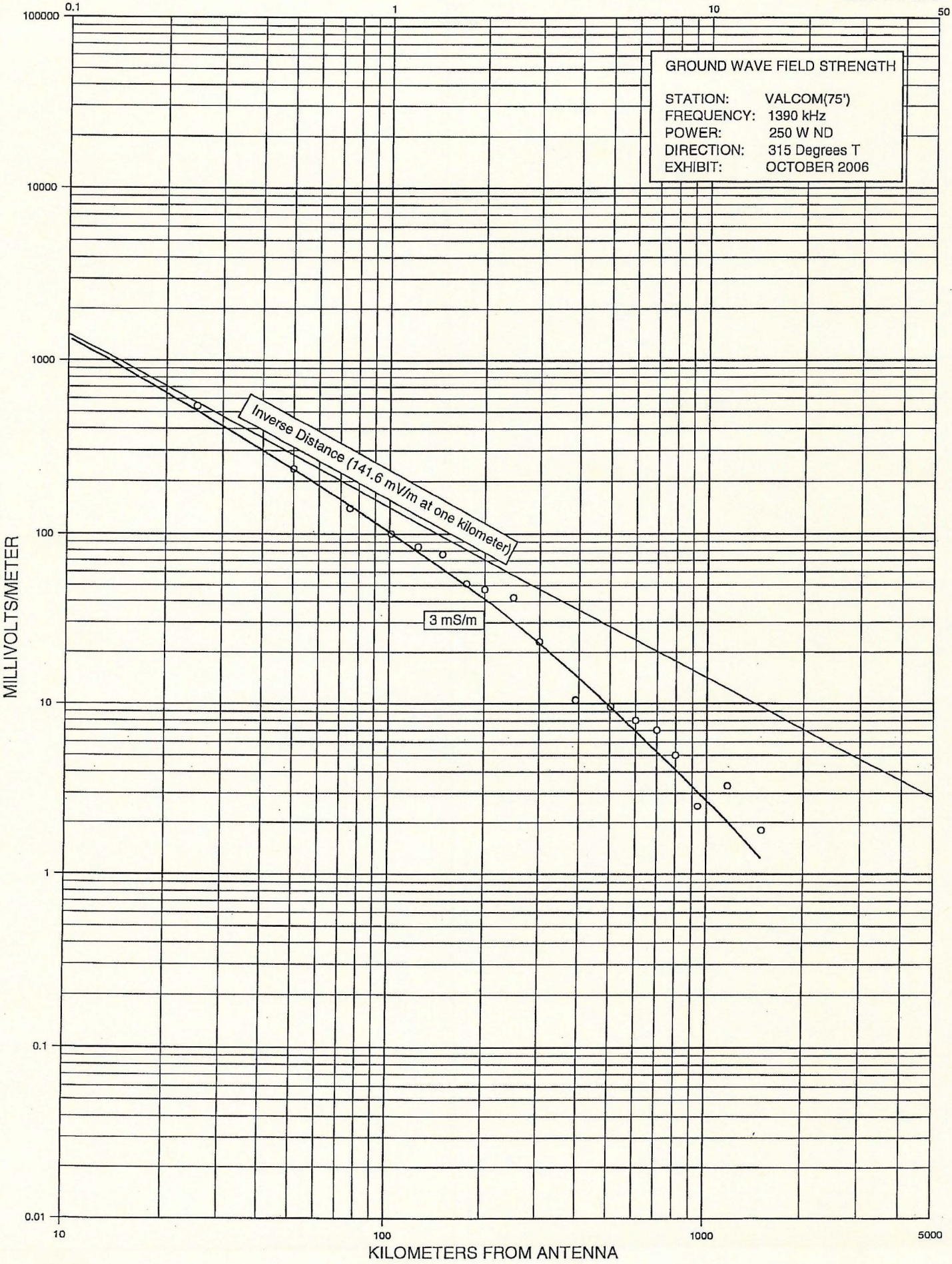



KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
GROUND WAVE FIELD STRENGTH
STATION: VALCOM(75')
FREQUENCY: 1390 kHz
POWER: 250 W ND
DIRECTION: 100 Degrees T
EXHIBIT: OCTOBER 2006
Inverse Distance (141.6 mV/m at one kilometer)
2 mS/m
3 mS/m
MILLIVOLTS/METER
10
100
1000
5000
KILOMETERS FROM ANTENNA

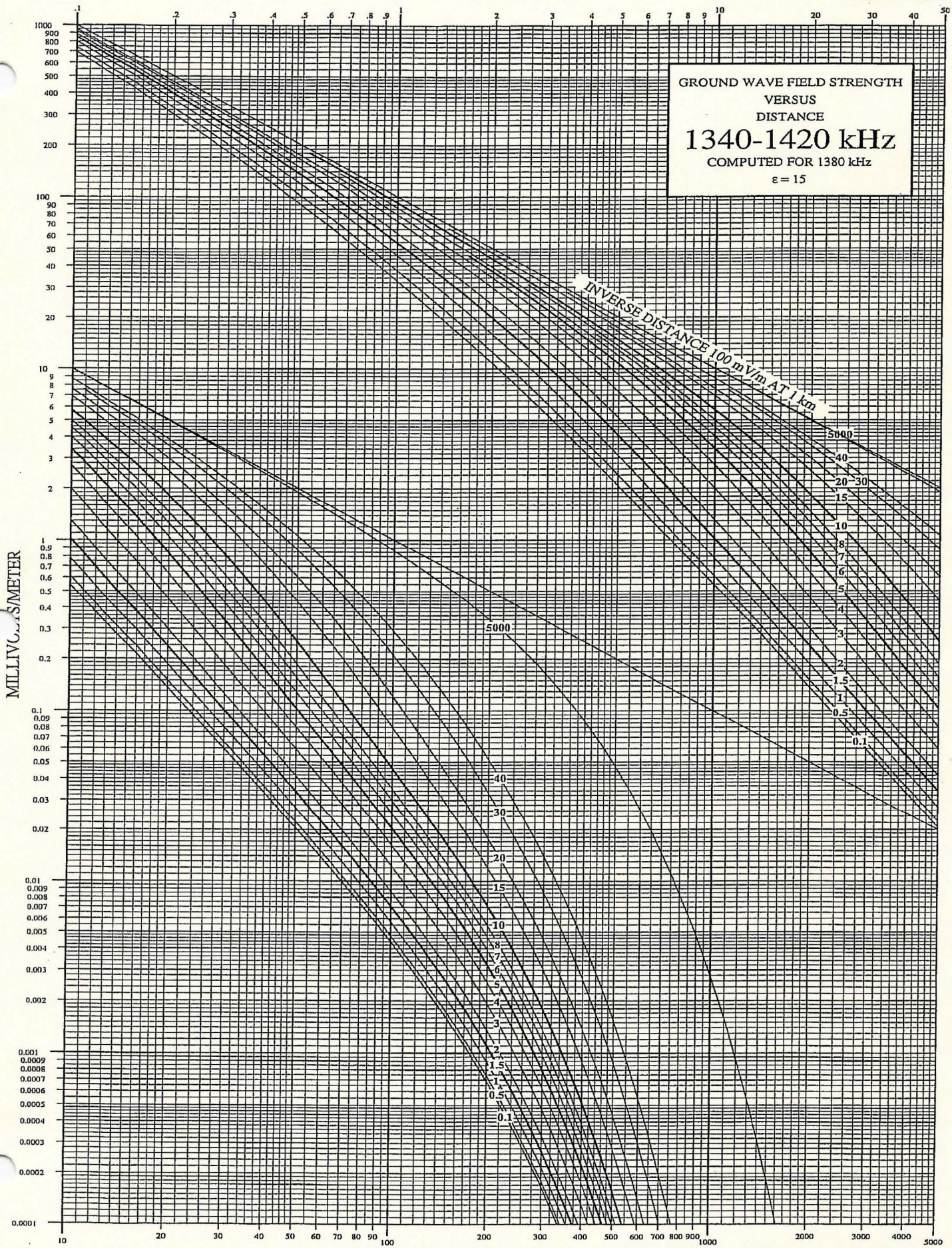

KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
GROUND WAVE FIELD STRENGTH
STATION: VALCOM(75')
FREQUENCY: 1390 kHz
POWER: 250 W ND
DIRECTION: 160 Degrees T
EXHIBIT: OCTOBER 2006
Inverse Distance (141.6 mV/m at one kilometer)
5 mS/m
3 mS/m
MILLIVOLTS/METER
10
100
1000
5000
KILOMETERS FROM ANTENNA


KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
GROUND WAVE FIELD STRENGTH
STATION: VALCOM(75')
FREQUENCY: 1390 kHz
POWER: 250 W ND
DIRECTION: 215 Degrees T
EXHIBIT: OCTOBER 2006
Inverse Distance (141.6 mV/m at one kilometer)
3 mS/m
MILLIVOLTS/METER
10
100
1000
5000
KILOMETERS FROM ANTENNA


KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
MILLIVOLTS/METER
GROUND WAVE FIELD STRENGTH
STATION: VALCOM(75')
FREQUENCY: 1390 kHz
POWER: 250 W ND
DIRECTION: 270 Degrees T
EXHIBIT: OCTOBER 2006
Inverse Distance (141.6 mV/m at one kilometer)
5 mS/m
10
100
1000
5000
KILOMETERS FROM ANTENNA


KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
MILLIVOLTS/METER
GROUND WAVE FIELD STRENGTH
STATION: VALCOM(75')
FREQUENCY: 1390 kHz
POWER: 250 W ND
DIRECTION: 315 Degrees T
EXHIBIT: OCTOBER 2006
Inverse Distance (141.6 mV/m at one kilometer)
3 mS/m
10
100
1000
5000
KILOMETERS FROM ANTENNA

KILOMETERS FROM ANTENNA



KILOMETERS FROM ANTENNA
GRAPH 17

Valcom AM Broadcast Antenna

(75 foot with Valcosphere)
Operating Frequency: 1700 kHz

0 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	11/14/06	1602	500
2	0.45	11/14/06	1550	195
3	0.62	11/14/06	1515	145
4	0.75	11/14/06	1510	105
5	1.00	11/14/06	1358	94.0
6	1.25	11/14/06	1400	62.0
7	1.50	11/14/06	1402	47.0
8	1.80	11/14/06	1405	40.0
9	2.25	11/14/06	1408	29.0
10	2.50	11/14/06	1411	22.0
11	3.00	11/14/06	1413	19.0
12	4.00	11/14/06	1419	10.5
13	5.00	11/14/06	1422	7.20
14	7.00	11/14/06	1427	4.10
15	8.00	11/14/06	1430	3.40
16	9.50	11/14/06	1433	2.30
17	11.00	11/14/06	1436	1.75
18	13.00	11/14/06	1440	1.40
19	15.00	11/14/06	1443	1.10

Valcom AM Broadcast Antenna
(75 foot with Valcosphere)
Operating Frequency: 1700 kHz

40 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	11/15/06	1630	500
2	0.50	11/15/06	1622	200
3	0.75	11/15/06	1617	148
4	1.10	11/15/06	1609	74.0
5	1.48	11/15/06	1606	53.0
6	1.76	11/15/06	1602	41.5
7	2.00	11/15/06	1600	38.0
8	3.00	11/15/06	1557	16.5
9	4.00	11/15/06	1555	9.00
10	5.00	11/15/06	1553	8.60
11	6.00	11/15/06	1550	5.00
12	7.00	11/15/06	1548	3.00
13	9.10	11/15/06	1545	2.50
14	11.00	11/15/06	1540	1.70
15	13.00	11/15/06	1536	1.10
16	14.70	11/15/06	1533	0.90

Valcom AM Broadcast Antenna
(75 foot with Valcosphere)
Operating Frequency: 1700 kHz

100 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.26	11/15/06	1637	520
2	0.50	11/15/06	1640	240
3	0.75	11/15/06	1425	160
4	1.00	11/15/06	1430	100
5	1.27	11/15/06	1432	68.0
6	1.50	11/15/06	1435	58.0
7	1.79	11/15/06	1439	42.0
8	2.21	11/15/06	1442	26.0
9	2.77	11/15/06	1444	19.0
10	4.00	11/15/06	1447	11.5
11	6.00	11/15/06	1452	4.90
12	7.02	11/15/06	1454	2.70
13	9.00	11/15/06	1458	1.70
14	11.50	11/15/06	1502	1.35
15	13.00	11/15/06	1508	1.00
16	14.20	11/15/06	1511	0.98

Valcom AM Broadcast Antenna
(75 foot with Valcosphere)
Operating Frequency: 1700 kHz

160 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	11/21/06	1308	440
2	0.50	11/21/06	1305	210
3	0.75	11/21/06	1300	160
4	1.03	11/21/06	1310	105
5	1.35	11/21/06	1312	88.0
6	1.75	11/21/06	1315	62.0
7	2.00	11/21/06	1317	51.0
8	2.50	11/21/06	1319	29.0
9	3.23	11/21/06	1321	26.0
10	4.00	11/21/06	1323	9.60
11	5.00	11/21/06	1325	9.60
12	7.50	11/21/06	1330	5.40
13	9.00	11/21/06	1335	1.90
14	11.10	11/21/06	1340	1.60
15	13.00	11/21/06	1344	1.30
16	15.00	11/21/06	1348	1.10

Valcom AM Broadcast Antenna
(75 foot with Valcosphere)
Operating Frequency: 1700 kHz

215 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	11/21/06	1508	450
2	0.60	11/21/06	1506	170
3	0.90	11/21/06	1502	94.0
4	1.40	11/21/06	1459	64.0
5	1.80	11/21/06	1457	44.0
6	2.30	11/21/06	1455	26.5
7	3.00	11/21/06	1451	19.5
8	4.00	11/21/06	1448	13.5
9	5.00	11/21/06	1446	5.20
10	7.25	11/21/06	1443	4.80
11	8.00	11/21/06	1440	3.10
12	10.00	11/21/06	1435	2.40
13	11.00	11/21/06	1432	1.90
14	13.00	11/21/06	1426	1.40
15	15.00	11/21/06	1420	1.10

Valcom AM Broadcast Antenna
(75 foot with Valcosphere)
Operating Frequency: 1700 kHz

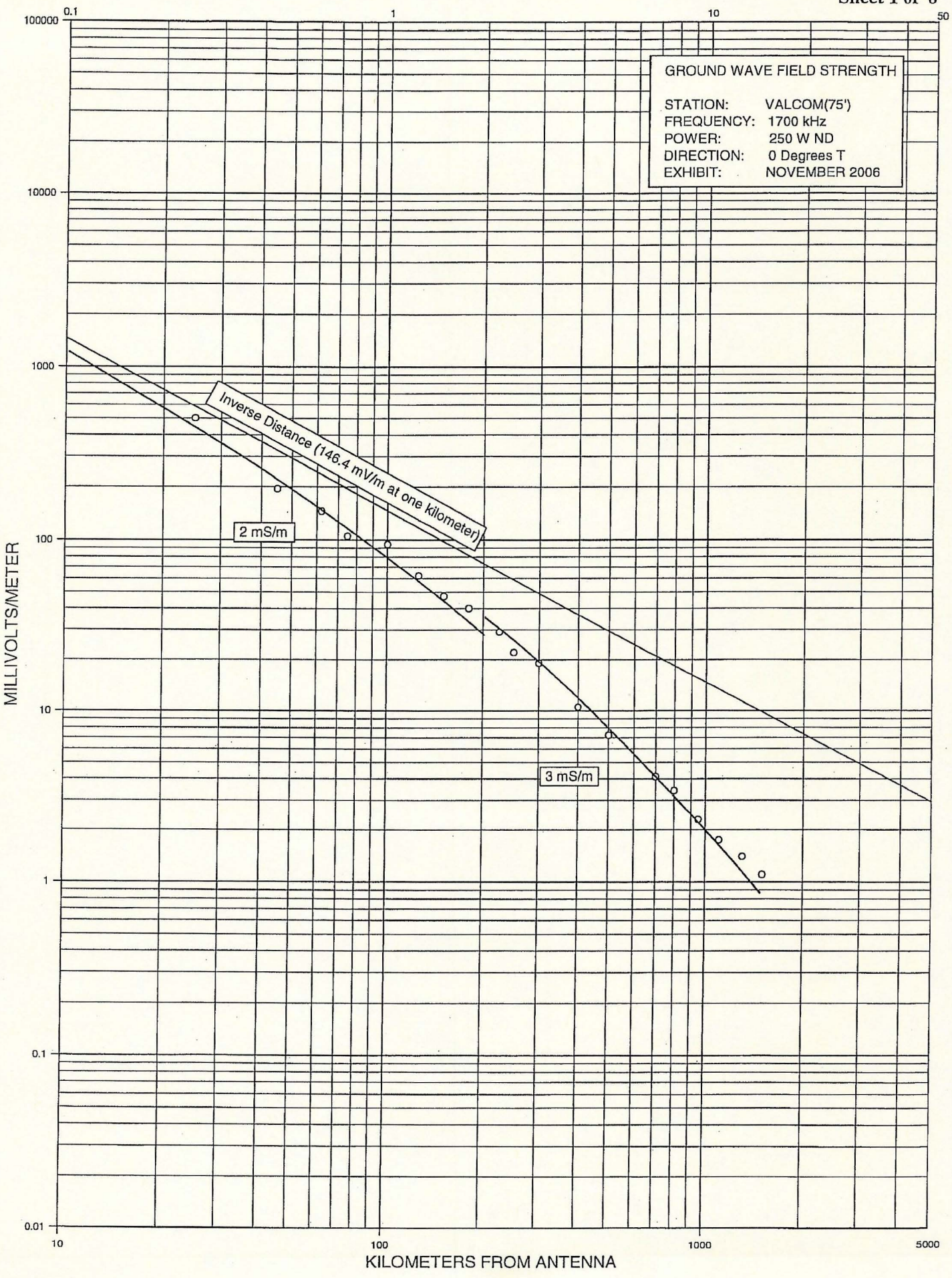
270 Degree Radial

Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	11/22/06	1302	480
2	0.58	11/22/06	1258	250
3	0.75	11/22/06	1251	150
4	0.95	11/22/06	1245	135
5	1.25	11/22/06	1309	105
6	1.50	11/22/06	1313	78.0
7	1.75	11/22/06	1317	64.0
8	2.00	11/22/06	1319	35.0
9	2.50	11/22/06	1321	41.0
10	2.92	11/22/06	1324	28.0
11	4.00	11/22/06	1327	17.5
12	5.00	11/22/06	1331	11.0
13	7.00	11/22/06	1335	7.60
14	8.50	11/22/06	1339	4.40
15	10.60	11/22/06	1344	3.20
16	13.50	11/22/06	1349	2.40
17	15.50	11/22/06	1354	1.80

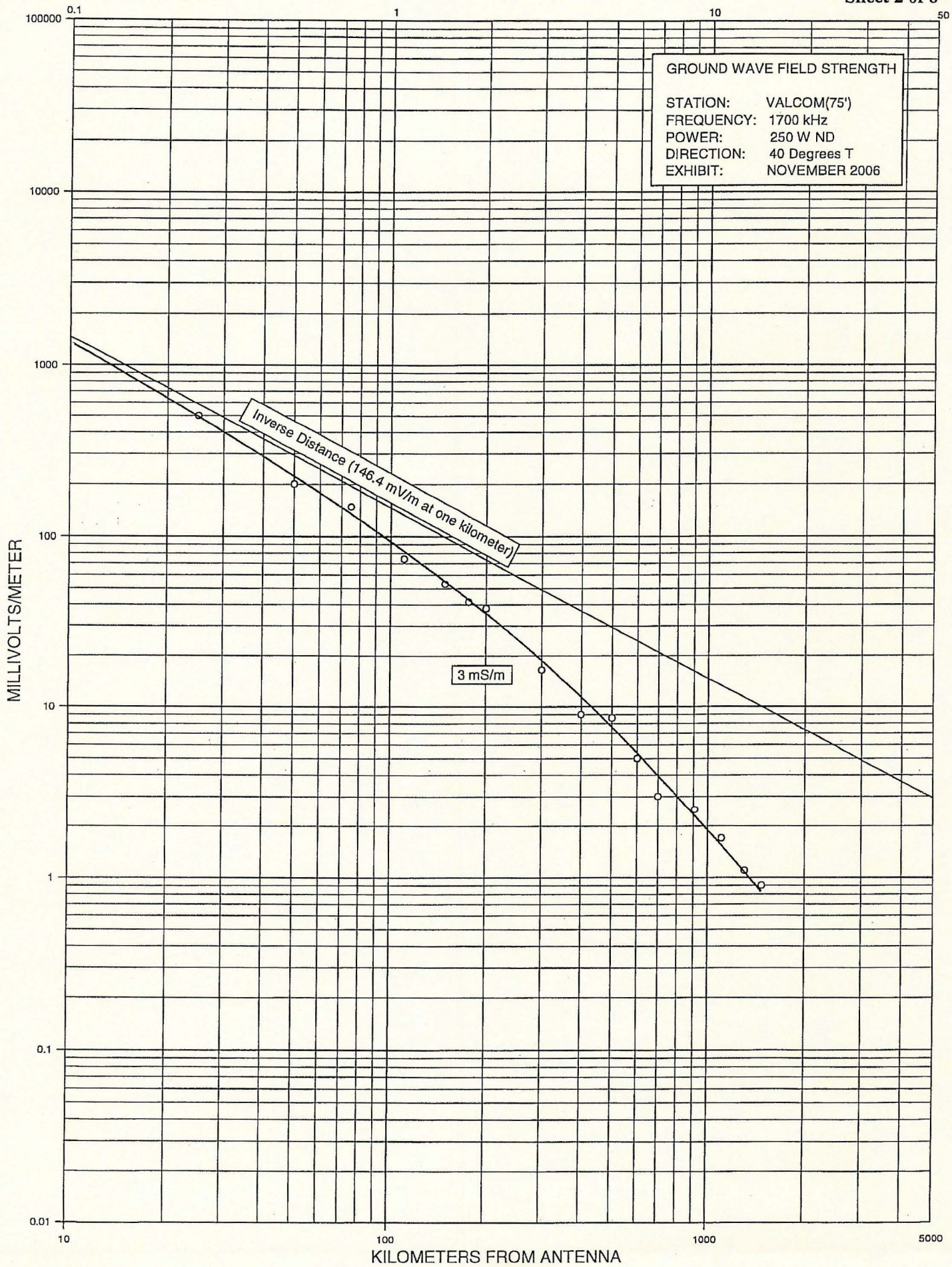
Valcom AM Broadcast Antenna
(75 foot with Valcosphere)
Operating Frequency: 1700 kHz

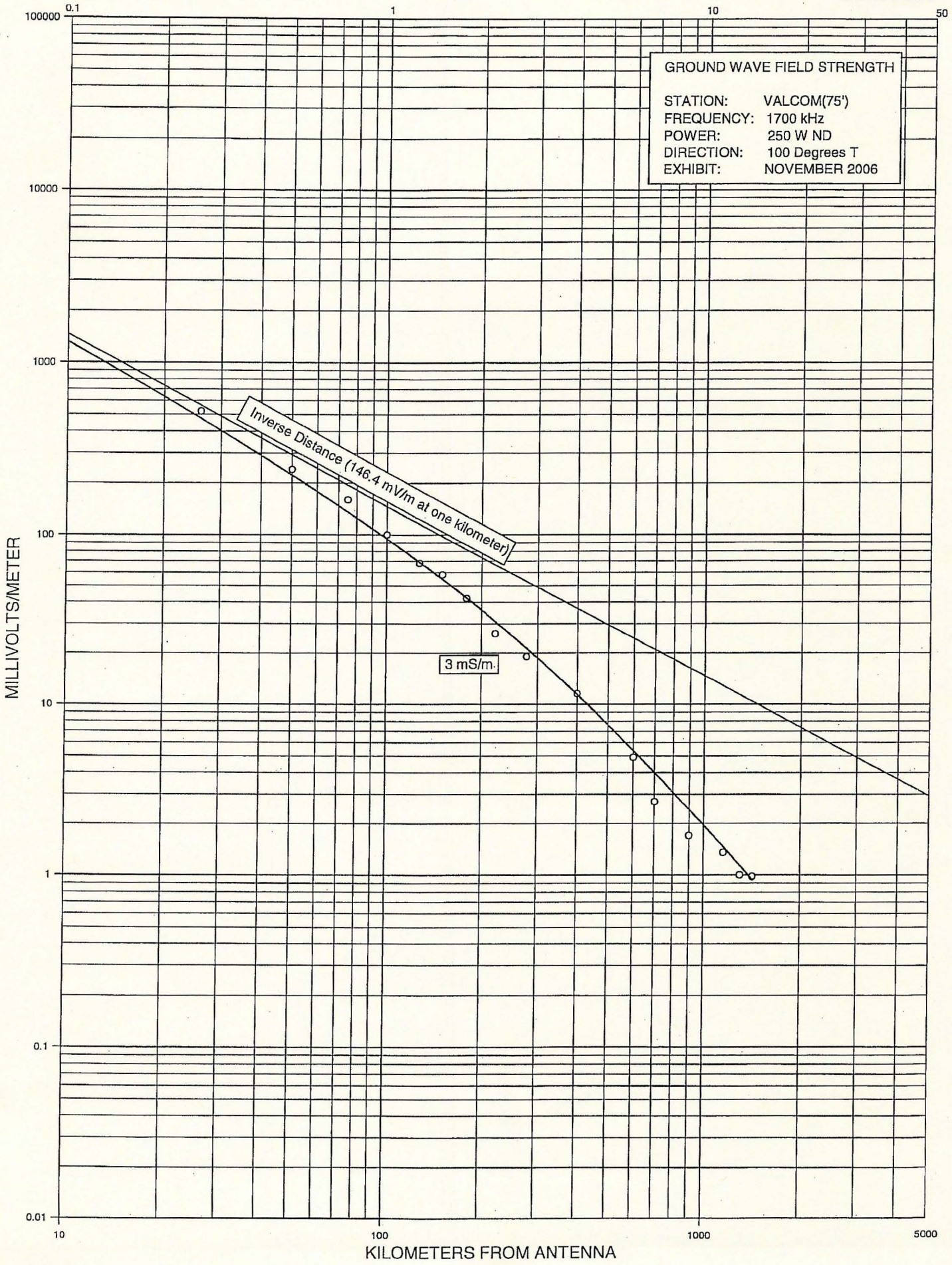
315 Degree Radial

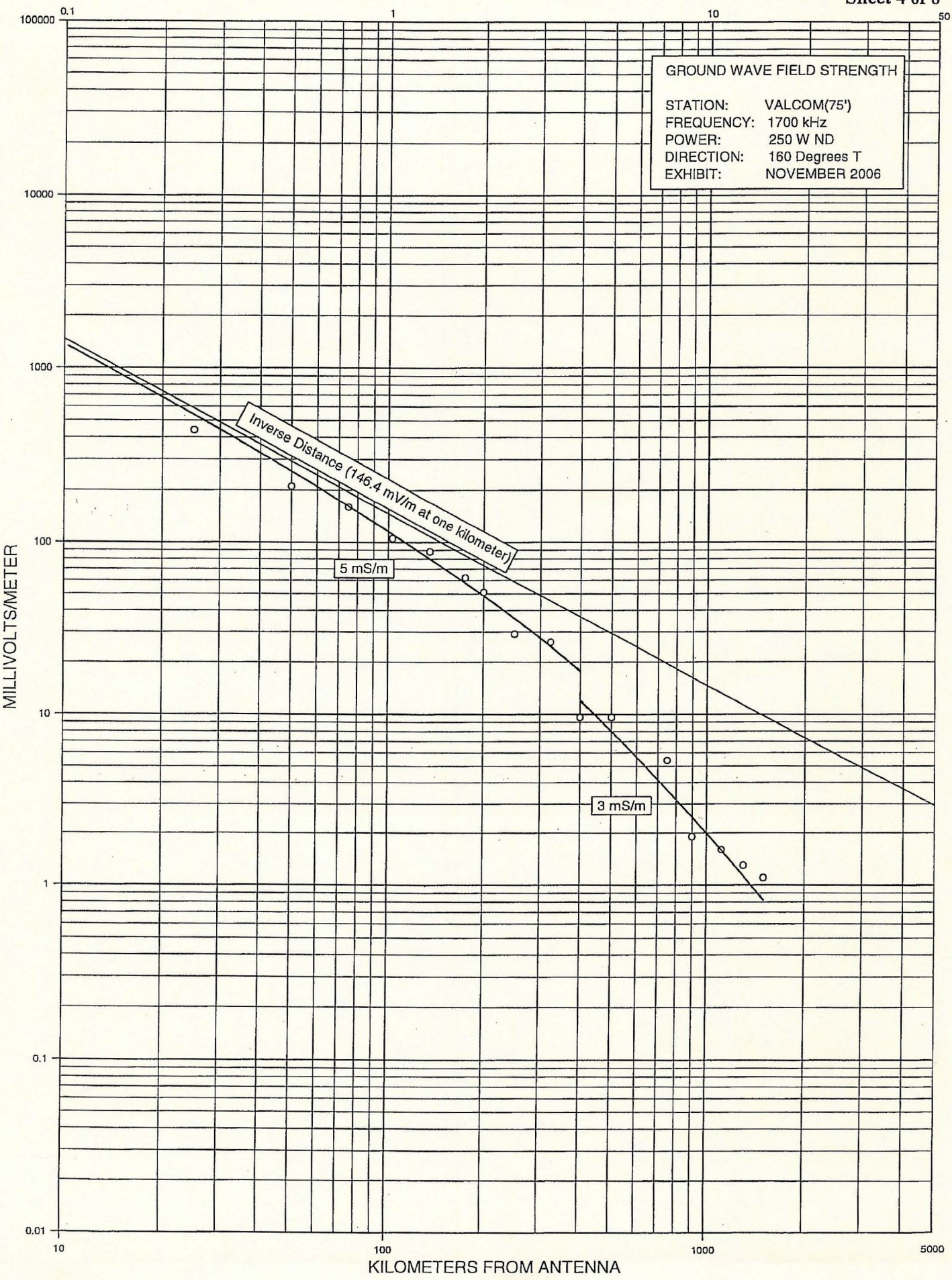
Point Desig.	Distance (km)	Date	Time (local)	Field Strength (mV/m)
1	0.25	11/22/06	1532	450
2	0.50	11/22/06	1527	250
3	0.75	11/22/06	1520	142
4	1.01	11/22/06	1510	100
5	1.23	11/22/06	1500	82.0
6	1.47	11/22/06	1456	74.0
7	1.75	11/22/06	1454	56.0
8	2.00	11/22/06	1451	54.0
9	2.48	11/22/06	1448	39.0
10	3.00	11/22/06	1438	22.0
11	3.90	11/22/06	1435	15.0
12	5.03	11/22/06	1431	11.0
13	6.00	11/22/06	1428	7.50
14	7.00	11/22/06	1424	4.10
15	8.00	11/22/06	1421	3.70
16	9.40	11/22/06	1416	2.70
17	11.60	11/22/06	1412	2.00
18	14.80	11/22/06	1407	1.20

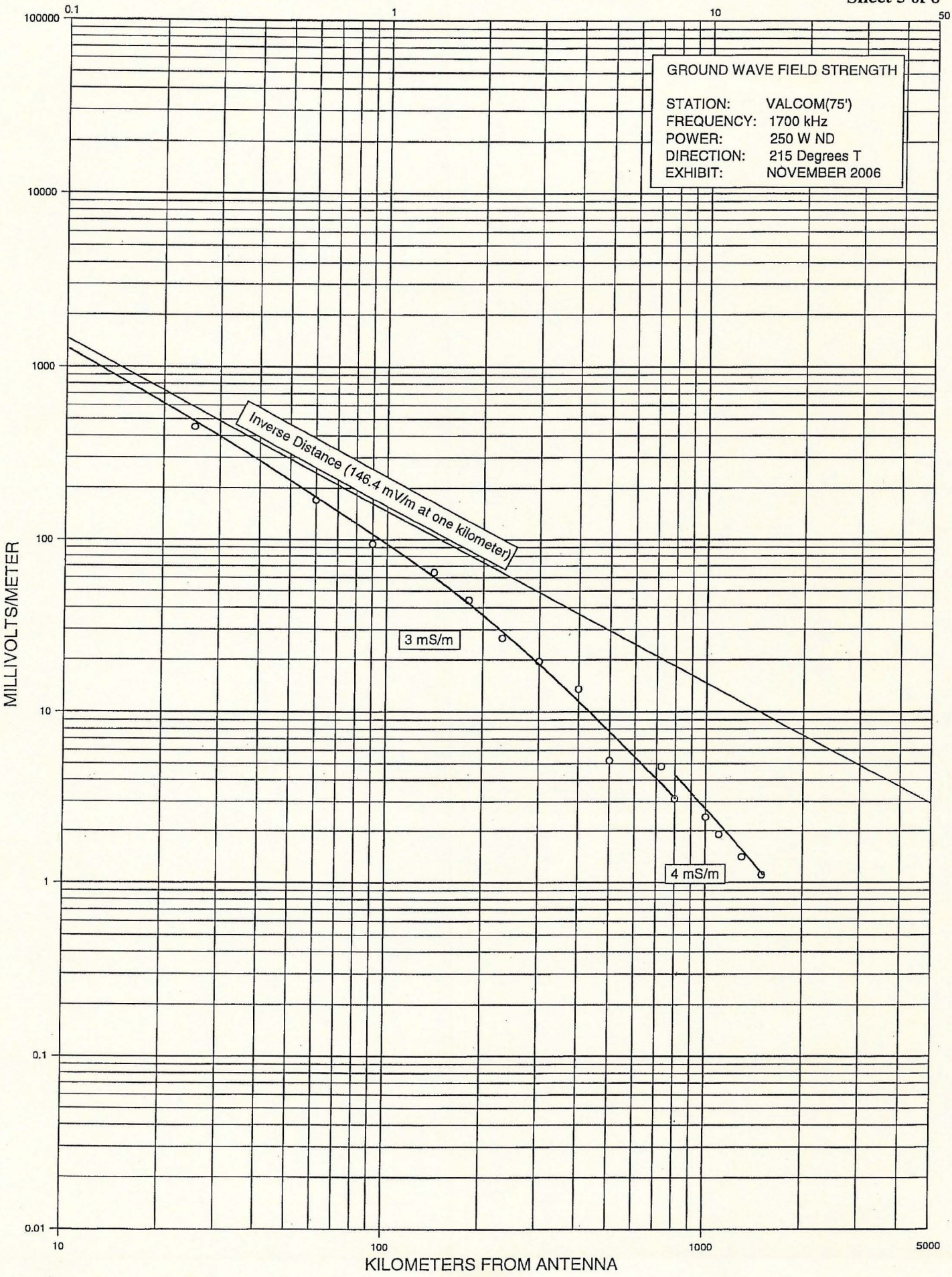

KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
GROUND WAVE FIELD STRENGTH
STATION: VALCOM(75')
FREQUENCY: 1700 kHz
POWER: 250 W ND
DIRECTION: 0 Degrees T
EXHIBIT: NOVEMBER 2006
Inverse Distance (146.4 mV/m at one kilometer)
2 mS/m
3 mS/m
MILLIVOLTS/METER
10
100
1000
5000
KILOMETERS FROM ANTENNA

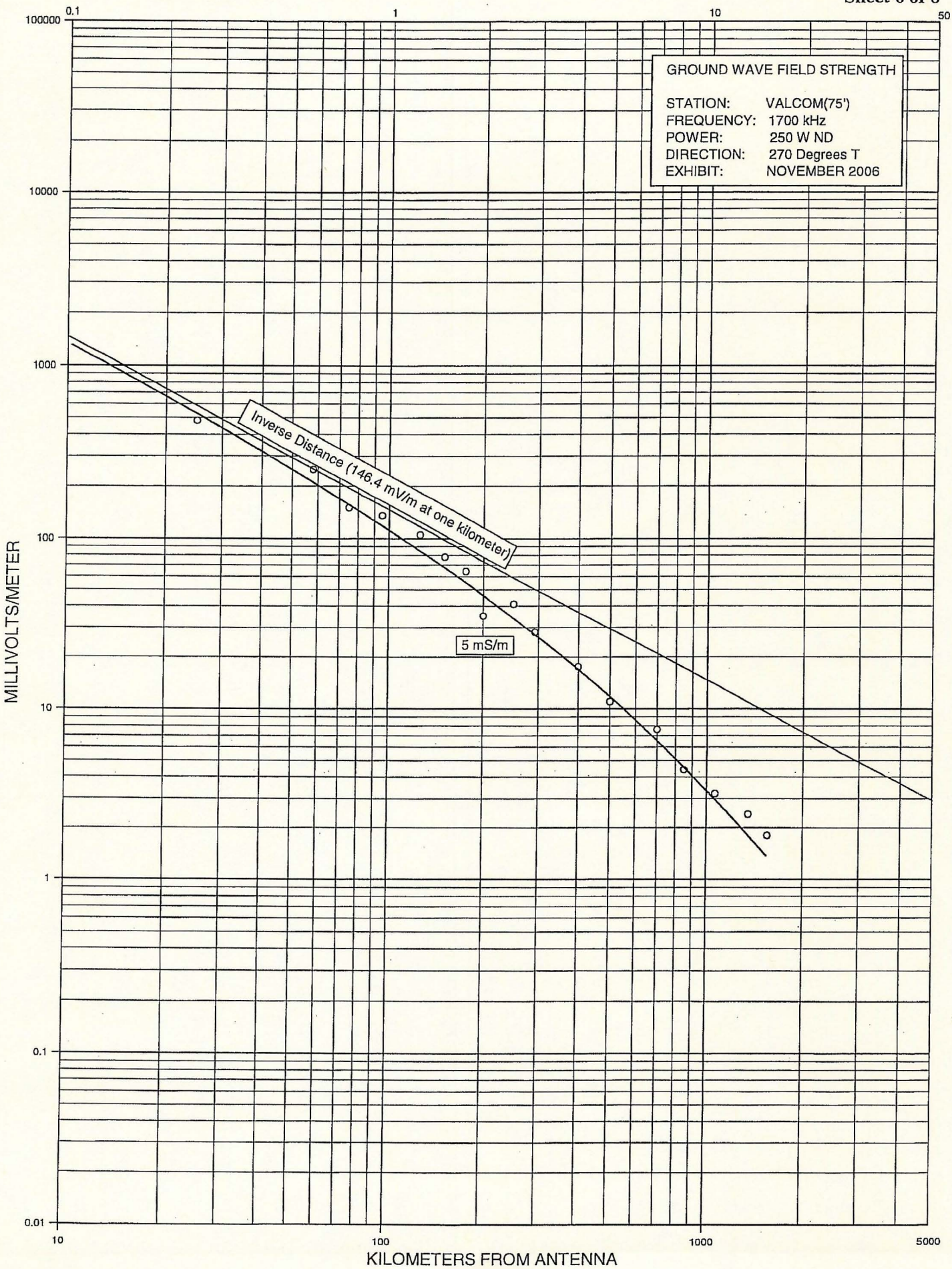
KILOMETERS FROM ANTENNA

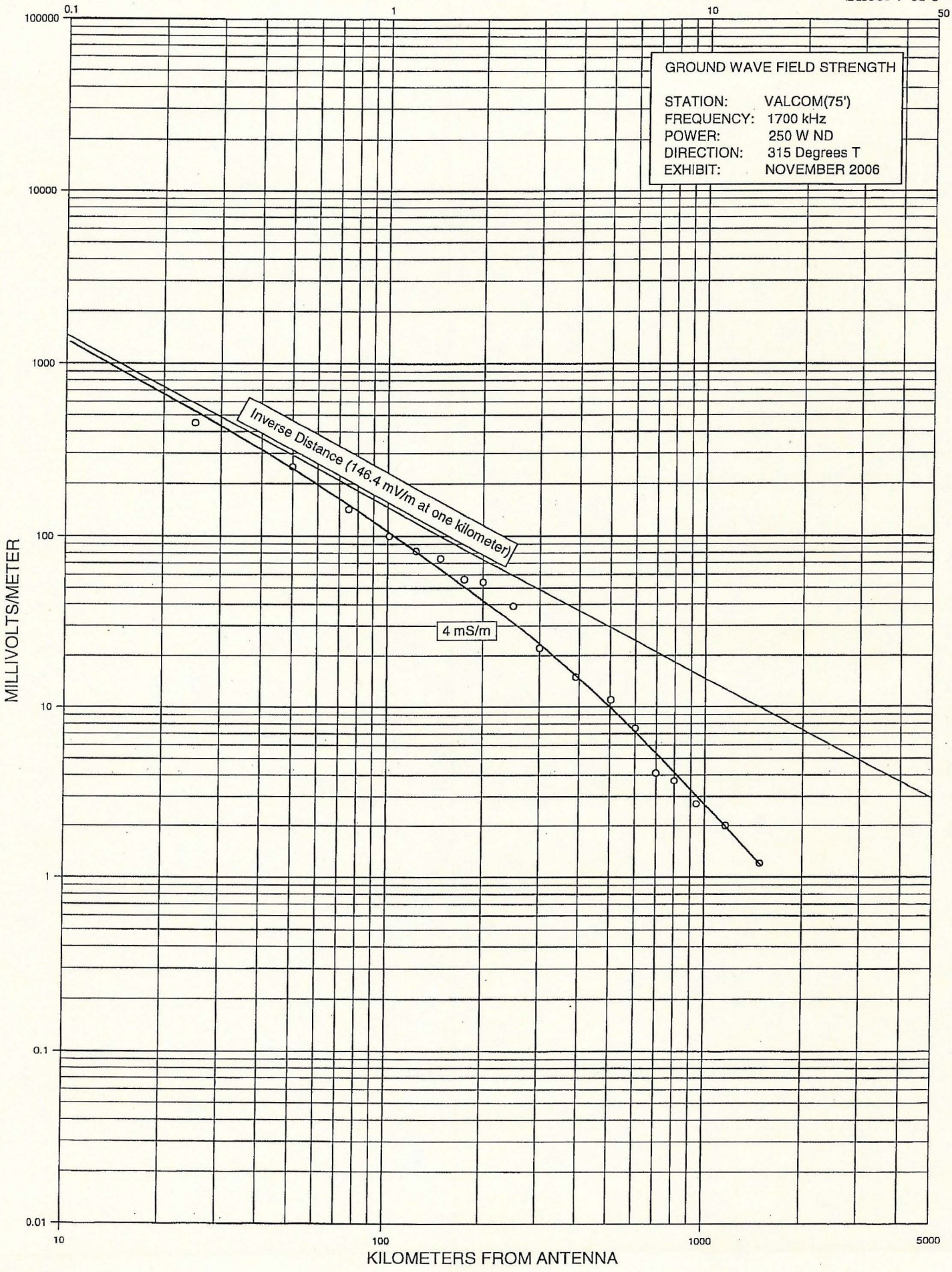



KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
MILLIVOLTS/METER
GROUND WAVE FIELD STRENGTH
STATION: VALCOM(75')
FREQUENCY: 1700 kHz
POWER: 250 W ND
DIRECTION: 100 Degrees T
EXHIBIT: NOVEMBER 2006
Inverse Distance (146.4 mV/m at one kilometer)
3 mS/m.
10
100
1000
5000
KILOMETERS FROM ANTENNA

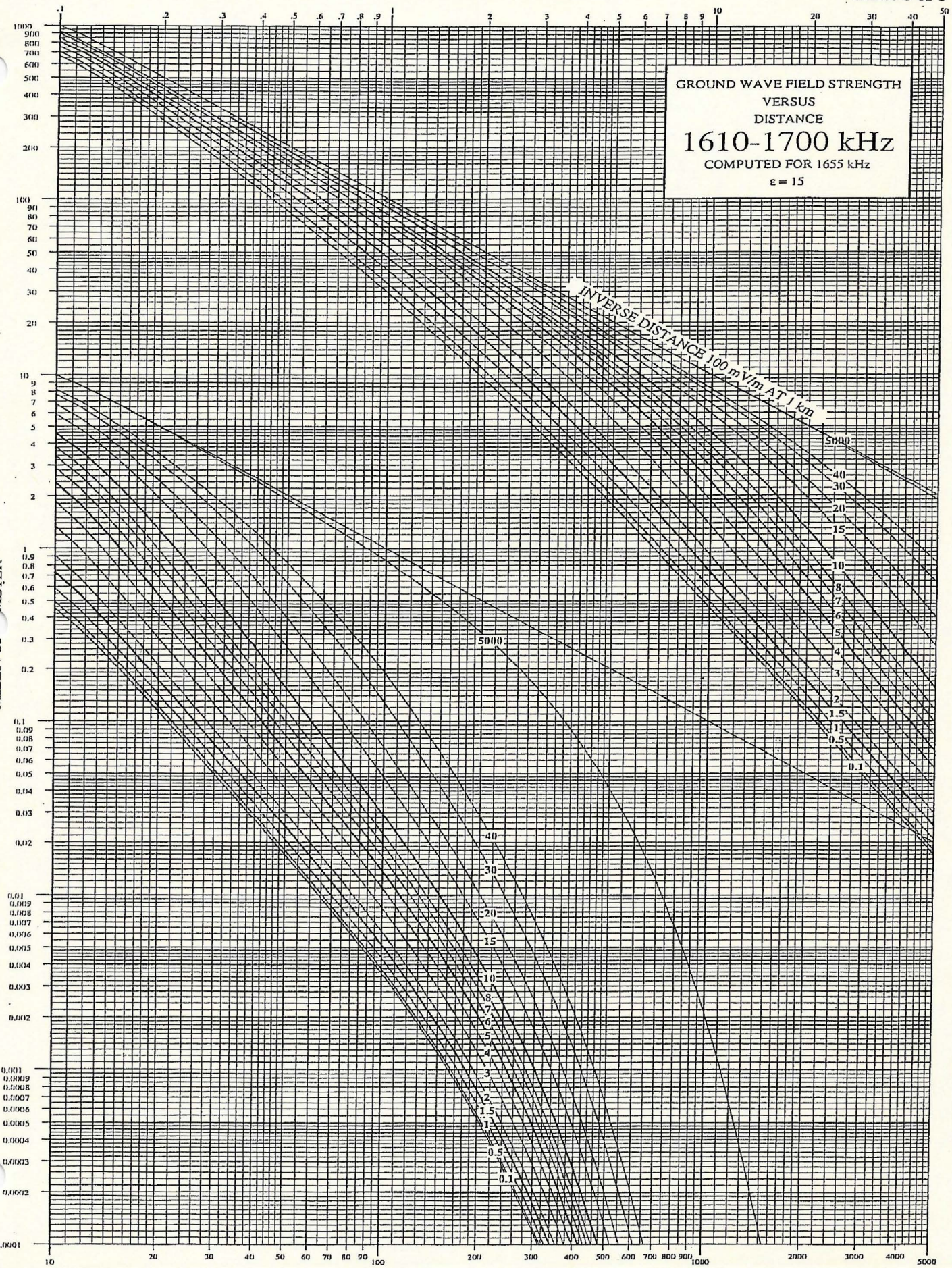

KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
MILLIVOLTS/METER
GROUND WAVE FIELD STRENGTH
STATION: VALCOM(75')
FREQUENCY: 1700 kHz
POWER: 250 W ND
DIRECTION: 160 Degrees T
EXHIBIT: NOVEMBER 2006
Inverse Distance (146.4 mV/m at one kilometer)
5 mS/m
3 mS/m
10
100
1000
5000
KILOMETERS FROM ANTENNA


KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
MILLIVOLTS/METER
GROUND WAVE FIELD STRENGTH
STATION: VALCOM(75')
FREQUENCY: 1700 kHz
POWER: 250 W ND
DIRECTION: 215 Degrees T
EXHIBIT: NOVEMBER 2006
Inverse Distance (146.4 mV/m at one kilometer)
3 mS/m
4 mS/m
10
100
1000
5000
KILOMETERS FROM ANTENNA


KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
MILLIVOLTS/METER
GROUND WAVE FIELD STRENGTH
STATION: VALCOM(75')
FREQUENCY: 1700 kHz
POWER: 250 W ND
DIRECTION: 270 Degrees T
EXHIBIT: NOVEMBER 2006
Inverse Distance (146.4 mV/m at one kilometer)
5 mS/m
10
100
1000
5000
KILOMETERS FROM ANTENNA


KILOMETERS FROM ANTENNA
0.1
1
10
50
100000
10000
1000
100
10
1
0.1
0.01
GROUND WAVE FIELD STRENGTH
STATION: VALCOM(75')
FREQUENCY: 1700 kHz
POWER: 250 W ND
DIRECTION: 315 Degrees T
EXHIBIT: NOVEMBER 2006
Inverse Distance (146.4 mV/m at one kilometer)
4 mS/m
MILLIVOLTS/METER
10
100
1000
5000
KILOMETERS FROM ANTENNA

KILOMETERS FROM ANTENNA



KILOMETERS FROM ANTENNA

GRAPH 20

Figure 9

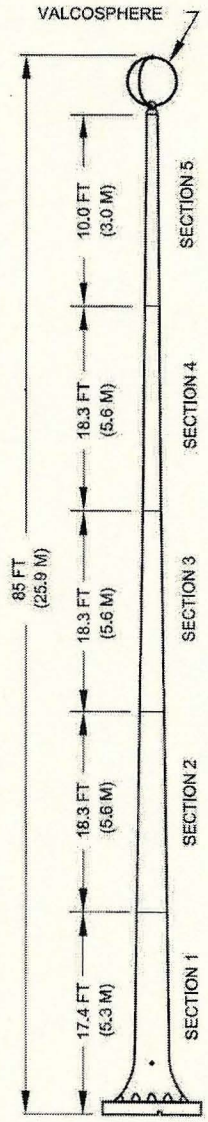
Tabulation of Radiation Efficiency of Valcom AM Broadcast Antennas

Frequency (KHz)	Unattenuated Field for 1.0 KW (mV/M at 1.0 KM) Model Pole	
	85 Foot	75 Foot
1200	282.0	
1210	282.4	
1220	282.8	
1230	283.2	
1240	283.6	
1250	284.1	
1260	284.5	
1270	284.9	
1280	285.2	
1290	285.6	
1300	286.0	
1310	286.4	
1320	286.8	
1330	287.1	
1340	287.5	
1350	287.9	
1360	288.2	
1370	288.6	
1380	288.9	
1390	289.2	283.2
1400	--	283.6
1410	--	283.9
1420	--	284.3
1430	--	284.6
1440	--	285.0
1450	--	285.3

Frequency (KHz)	Unattenuated Field for 1.0 KW (mV/M at 1.0 KM) Model Pole	
	85 Foot	75 Foot
1460	--	285.6
1470	--	286.0
1480	--	286.3
1490	--	286.7
1500	--	287.0
1510	--	287.3
1520	--	287.6
1530	--	287.9
1540	--	288.2
1550	--	288.5
1560	--	288.8
1570	--	289.1
1580	--	289.4
1590	--	289.7
1600	--	290.0
1610	--	290.3
1620	--	290.5
1630	--	290.8
1640	--	291.0
1650	--	291.3
1660	--	291.6
1670	--	291.9
1680	--	292.1
1690	--	292.4
1700	--	292.8

Figure 10

V33085AM-CL2
QUICK REFERENCE DATA



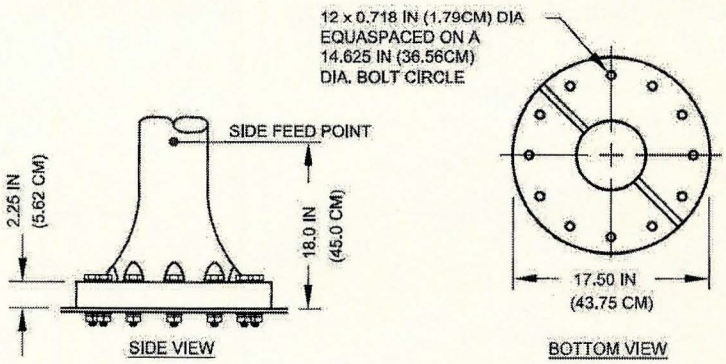
ELECTRICAL CHARACTERISTICS

RESONANT FREQUENCY (f_o)	540 - 1700 KHZ (SPECIFIED BY CUST)
POWER RATING	2 KW FOR FREQ OF 540 - 790 KHZ
	4 KW FOR FREQ OF 800 - 1090 KHZ
	6 KW FOR FREQ OF 1100 - 1390 KHZ
	10 KW FOR FREQ OF 1400 - 1700 KHZ
DRY WITHSTANDING VOLTAGE	30 KV
ELECTRICAL LENGTH	DEPENDANT ON f_o
POSITION OF LOADING COIL	2ND SECTION
OPERATING FREQUENCY	SPECIFIED BY CUSTOMER
INPUT IMPEDANCE AT f_o	DEPENDANT ON f_o
Q AT OPERATING FREQUENCY	DEPENDANT ON f_o

MECHANICAL CHARACTERISTICS

MECHANICAL LENGTH	85 FT (25.9 M)
VALCOSPHERE	32 IN (81.3 CM) DIA
ANTENNA MATERIAL	FILAMENT WOUND EPOXY/FIBREGLASS
TOP TERMINATION	VALCOSPHERE
JOINTS	BRONZE FERRULE C/W LOCKING PIN
WIND LOADING TEST	170 MPH (272 KPH)
TEMPERATURE	-60°F TO 150°F (-50°C TO 65°C)
FINISH	EPOXY POLYAMIDE PAINT
COLOUR	WHITE, OTHER COLOURS AVAILABLE
WEIGHT	950 LBS (432 KG) MAX

NOTES:
1. THE ADVANTAGE OF A CENTRE LOADING COIL IS A REDUCED RESONANCE OVER THAT OF A STRAIGHT 1/4-WAVE WHIP WHICH REDUCES BASE FEED IMPEDANCE AND VOLTAGE, THEREFORE PROVIDING AND GREATER POWER HANDLING CAPABILITY.
2. DO NOT USE LEAD BASE PAINT TO TOUCH-UP OR REPAINT ANTENNA.



P.O. BOX 603 GUELPH, ONTARIO, CANADA, N1H 6L3
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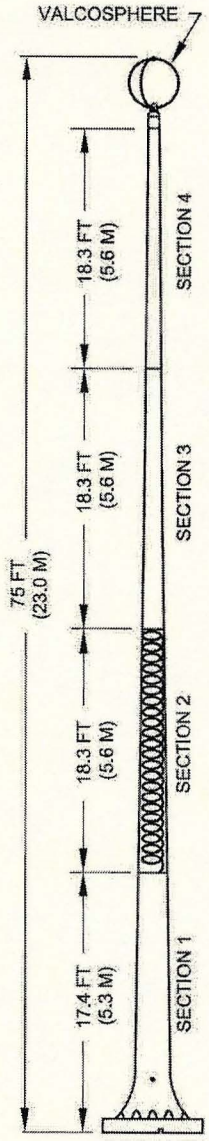
INTERNET: www.valcom-guelph.com EMAIL: enquiries@valcom-guelph.com

Figure 11

V33075AM-CL2
QUICK REFERENCE DATA



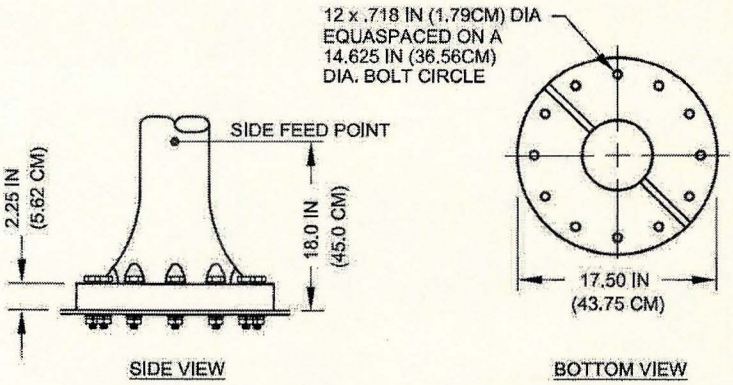
ELECTRICAL CHARACTERISTICS

RESONANT FREQUENCY (f_0)	540 - 1700 KHZ (SPECIFIED BY CUST)
POWER RATING	2 KW FOR FREQ OF 540 - 1000 KHZ
	5 KW FOR FREQ OF 1000 - 1700 KHZ
DRY WITHSTANDING VOLTAGE	30 KV
ELECTRICAL LENGTH	DEPENDANT ON f_0
POSITION OF LOADING COIL	2ND SECTION
INPUT IMPEDANCE AT f_0	DEPENDANT ON f_0
Q AT SELF-RESONANCE	DEPENDANT ON f_0

MECHANICAL CHARACTERISTICS

MECHANICAL LENGTH	75 FT (23 M)
TOP TERMINATION	VALCOSPHERE
VALCOSPHERE	32 IN (81 CM) DIA
ANTENNA MATERIAL	FILAMENT WOUND EPOXY/FIBREGLASS
JOINTS	BRONZE FERRULE C/W LOCKING PIN AND BANANA PLUG
FINISH	EPOXY POLYAMIDE PAINT
WIND LOADING TEST	150 MPH (241 KPH)
TEMPERATURE	-60°F TO 150°F (-50°C TO 65°C)
WEIGHT	800 LBS (362 KG) MAX

NOTES:
1. THE ADVANTAGE OF THE CENTRE LOADING COIL IN SECTION TWO IS TO PROVIDE REDUCED RESONANCE OVER A STRAIGHT VERTICAL WHIP, THEREFORE REDUCING BASE FEED VOLTAGE AND PROVIDING A GREATER POWER HANDLING CAPABILITY.
2. DO NOT USE LEAD BASE PAINT TO TOUCH-UP OR REPAINT ANTENNA.



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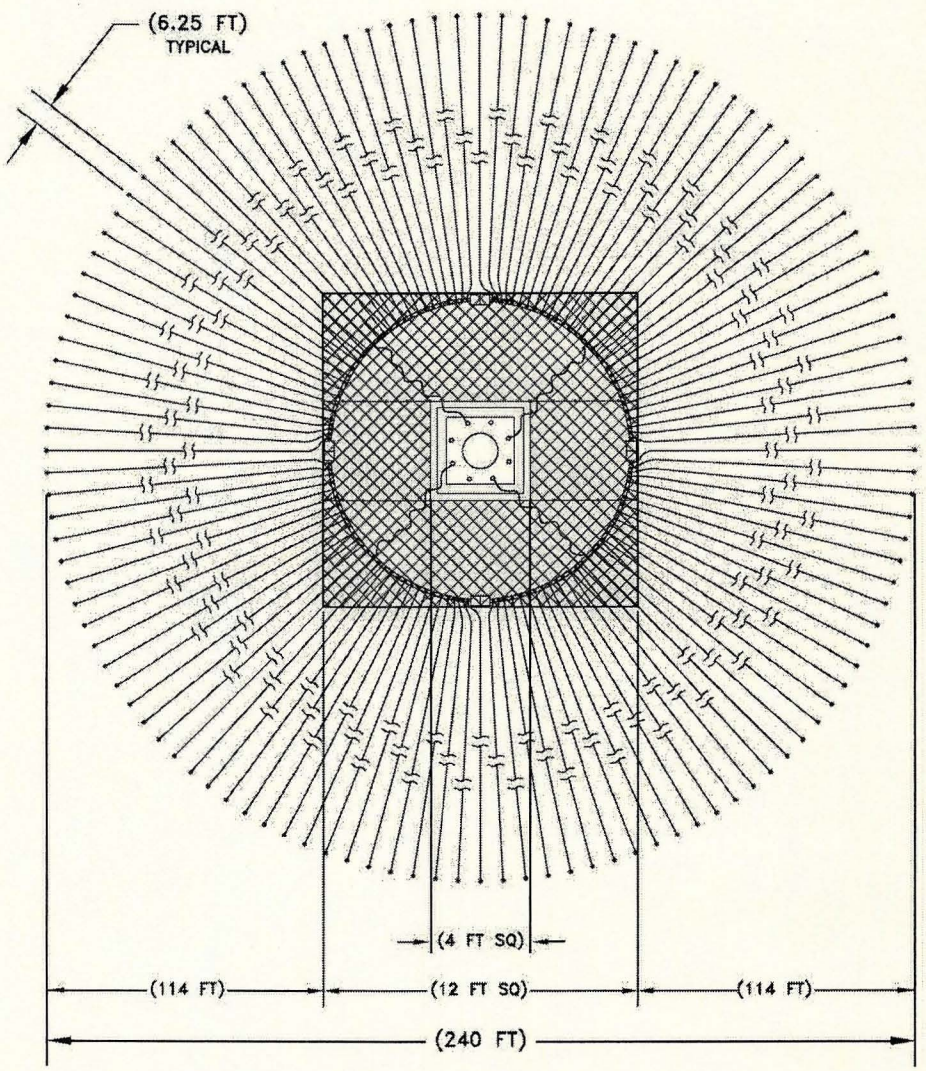
INTERNET: www.valcom-guelph.com EMAIL: enquiries@valcom-guelph.com

Figure 12

VGS-120120AM GROUND SCREEN
QUICK REFERENCE DATA



Valcom
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ATTACHMENT A

FCC OET Memorandum

May 1, 2003

UNITED STATES GOVERNMENT

memorandum

MAY 1 2 42 PM '03

DATE: May 1, 2003

REPLY TO
ATTN OF: Robert Bromery, Chief
Electromagnetic Compatibility Division, OET RMB

SUBJECT: F(theta) Formula for Valcom Antennas

TO: Edward P. De La Hunt, Assistant Chief,
Audio Services Division, Mass Media Bureau

We recommend that the formula given in Section 73.160(b) of FCC Rules for a "typical tower which is not top-loaded or sectionalized" should be used to represent the vertical plane radiation characteristics of the electrically short antennas manufactured by Valcom, Ltd. in the AM broadcast band. Our recommendation is based on a thorough study of the factors affecting radiation in the vertical plane of electrically short antennas in general and the Valcom, Ltd. Antenna in particular.

Valcom, Ltd. and several engineering consulting firms asked OET to identify an accurate f(theta) formula for electrically short Valcom antennas and to provide a derivation of the formula per Section 73.160(c) of FCC Rules. A study of this matter, attached, is our response to these requests. We find:

- The vertical radiation pattern of electrically short vertical monopole antennas is virtually independent of current distribution along the radiating element.
- The standard 49, 74 and 112-foot Valcom Ltd. Antennas meet this electrically short criterion at all frequencies of the AM broadcast band.
- The formula given as 73.160(b)(1) in FCC Rules accurately represents Valcom Ltd. antennas as well as the ideal simple vertical monopole for which it was originally derived.

If you have any questions in this matter, please contact Nam Pham at 418-2438, or Ronald Chase at 418-1378.

Robert Bromery

Attachment: The Electrically Short Vertical Monopole used for AM Broadcast — Engineering Analysis using *NEC-MOM* Software, Study Report by Ronald Chase, OET