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April 30, 2001

BY ELECTRONIC FILING

Ms. Magalie Roman Salas, Secretary
Federal Communications Commission
445 Twelfth Street, S.W.
Washington, DC 20554

Re: ***Written Ex Parte Presentation***
Establishment of Rules and Policies for the Satellite Digital Audio Radio Service in the 2310-2360 MHz Band
IB Docket No. 95-91

Dear Ms. Salas:

In this *ex parte* presentation, AT&T Wireless Services, Inc. ("ATTWS") submits further analysis, based on data recently exchanged by the parties, of the harmful interference that would be caused to Wireless Communications Services ("WCS") licensees if the two satellite Digital Audio Radio Service ("SDARS") licensees, XM Radio and Sirius, are allowed to deploy terrestrial repeaters operating at high power (up to 40 kW) rather than at the standard power level in this band (up to 2 kW). In addition, ATTWS responds to recent *ex parte* letters filed by Sirius[1] and XM[2] that, while long on unsupported assertions and unjustified aspersions, are woefully short on the kind of technical analysis needed in this proceeding and provided herein by ATTWS. While Sirius and XM are free to continue their practice of ignoring inconvenient facts, the Commission cannot similarly afford to pursue a course of willful blindness to the significant impact that high power terrestrial repeaters would have on WCS networks. The Commission must adopt rules that allow all licensed operators in the band to provide services in a manner consistent with their licenses and sound spectrum management principles.

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1 Letter from Carl R. Frank to Magalie Roman Salas, dated April 23, 2001 ("Sirius Letter").

2 Letter from Bruce D. Jacobs to Magalie Roman Salas, dated April 25, 2001 ("XM Letter").

SUMMARY

On March 8, 2001, WCS and SDARS licensees exchanged data concerning the technical characteristics of their respective terrestrial networks. The SDARS licensees provided basic information for their planned repeaters in three cities: Atlanta, San Francisco and Boston. Using the information for Atlanta, and the design specifications provided in this proceeding for its own WCS systems, ATTWS has used the deciBel Planner[3] software package advocated by the SDARS licensees to analyze the interference to its broadband WCS system from various configurations of terrestrial repeaters. In brief, this analysis establishes the following:

- If the SDARS licensees operate their terrestrial repeaters at the levels suggested in their non-binding submissions (approximately 10-13 kW EIRP each), interference to the ATTWS fixed wireless base station would preclude the provision of service to more than 171,000 households in Atlanta alone.

- If the SDARS licensees operate their repeaters at 40 kW EIRP, as allowed under the rules they have proposed, interference to the base station would preclude ATTWS fixed wireless service to nearly 435,000 households in Atlanta alone.

- By replacing their proposed high power repeaters with multiple standard power (2 kW) repeaters, the SDARS licensees could achieve the same coverage area for their own service but reduce the size of the exclusion zone in Atlanta by 141 km^2, or 43.2%.

ATTWS is not a competitor to the SDARS operators and does not begrudge them the ability to provide a quality service to the public. ATTWS accepts that terrestrial SDARS repeaters present an additional source of interference to its WCS networks. What it cannot accept is a large number of uncoordinated transmitters operating at up to 20 times its own power limit in the midst of its own band – especially if those repeaters may be deployed unilaterally, in the middle of an existing and operating WCS network. Both sets of licensees paid for their spectrum at auction or in the secondary market. It is reasonable to expect that both services should bear the burden of establishing a viable co-existence. Accordingly, in order to facilitate the development of both services, ATTWS urges the Commission adopt a rule with the following parameters:

(1) SDARS licensees may deploy terrestrial repeaters operating at peak EIRP of up to 400 W/MHz, evenly distributed across the band (for a total of 2 kW per 5 MHz).

(2) As specified by the SDARS licensees,[4] the out of band emissions generated by SDARS terrestrial repeaters shall be limited to 75 + 10 log(p) dB (where p is the EIRP in watts) less than the transmitter EIRP.

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[3] The deciBel Planner software package is marketed by Northwood Technologies, Inc., and came with data specific to the Atlanta market (the "200 meter data" set). For more information on this product, *see* www.northwoodtech.com.

[4] *See, e.g.*, Supplemental Comments of Sirius Satellite Radio, Exhibit 1 at p. 2 (filed Jan. 18, 2000).

(3) Codifying an international agreement with Mexico and the current designs proposed by XM and Sirius, SDARS terrestrial repeaters shall be located only in the bands 2324.2-2328.3 MHz and 2336.225-2341.285 MHz.

A proposed draft rule is attached as Attachment 1.

BACKGROUND

The SDARS spectrum is located in the middle of the 2.3 GHz band, with WCS spectrum adjacent above and below. WCS spectrum covers 2305-2320 MHz and 2345-2360 MHz. In between those two bands, at 2320-2345 MHz, sit Sirius and XM. Each SDARS licensee has set aside spectrum within its assigned frequencies for use by terrestrial repeaters, specifically 4.1 MHz for Sirius (2324.2-2328.3 MHz) and 5.06 MHz for XM (2336.225-2341.285 MHz). Although it controls spectrum in all of the WCS blocks, ATTWS has focused primarily on the WCS B band, which uses paired spectrum blocks located both above and below the SDARS band. For an illustration of the band plan, see Attachment 2.

Under Part 27 of the Commission's rules, WCS licensees using fixed systems are limited to 2 kW peak EIRP.[5] When the Commission initially proposed licensing terrestrial repeaters for SDARS, it sought comment on a proposal by Sirius (then CD Radio) that included no limits whatsoever on either the power or number of terrestrial repeaters to be deployed. In January of this year, Sirius proposed some, albeit very slight, restraint on the deployment of terrestrial repeaters that would have authorized an unlimited number of standard power repeaters (up to 2 kW) and up to 1,150 high power repeaters, operating at power levels up to 40 kW, without any requirement for coordination, approval or prior notice.[6] Most recently, Sirius has proposed a rule that would authorize deployment of an unlimited number of standard power repeaters plus up to 300 high power repeaters (up to 40 kW) totally as of right and without regard to the impact they would have on WCS operations.[7] The rule proposed by XM would authorize 500 high power repeaters (up to 40 kW) without coordination.[8] In addition, the rules proposed by both Sirius and XM would impose an ongoing coordination requirement on WCS operators for additional high power repeaters while explicitly exempting the SDARS licensees from a reciprocal obligation to coordinate with additional WCS deployments.[9] And under XM's proposal, an SDARS licensee would be entitled to operate its high power repeater during the entire time necessary to resolve a coordination dispute.[10]

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5 *See* 47 C.F.R. § 27.50(a).

6 *See* Letter from Carl R. Frank to Magalie Roman Salas, dated January 25, 2001.

7 *See* Sirius Letter at Exhibit 1 (proposed rule section 25.144(e)(3)(ii))

8 *See* XM Letter at Exhibit 1 (proposed rule section 25.144(e)(3)(iii)(A)).

9 *See* Sirius Letter at Exhibit 1 (proposed rule section 25.144(e)(4)(iv)); XM Letter at Exhibit 1 (proposed rule section 25.144(e)(4)(v)).

10 *See* XM Letter at Exhibit 1 (proposed rule section 25.144(e)(4)(iv)).

ATTWS is in the midst of deploying its broadband telephony and Internet wireless access service, often referred to as "Project Angel." The initial phases of its WCS networks are operational in Texas (Houston, Victoria, and College Station) and Alaska (Anchorage), and by the end of the year additional networks should be operational in Los Angeles, Las Vegas, Oklahoma City, Kansas City, and Tulsa. Understandably, ATTWS cannot accept the risks of interference to its lifeline service posed by a system of numerous uncoordinated terrestrial transmitters operating at high power levels in the midst of its own spectrum blocks.

TECHNICAL ANALYSIS

At the outset, it is important to understand what this *ex parte* submission can and cannot accomplish. ATTWS is but one of many WCS licensees. It has its own plans for system deployment to provide facilities-based competition and lifeline services in the local exchange and broadband access markets, using WCS equipment of its own design. It has limited data about the terrestrial networks planned by the SDARS licensees, and has been unable to get fairly basic additional technical data from XM and Sirius that could have enhanced the utility of its analysis.[11] Nonetheless, with the use of reasonable assumptions, it has been able to prepare this analysis to demonstrate the significant impact that the deployment of high power terrestrial repeaters would have on its service. While this analysis is instructive and indicative, the Commission's consideration must encompass more than the impact on one WCS licensee using a particular technology to provide a particular service offering. Other licensees, such as BellSouth, will likely experience far greater interference since their transmitters will operate at greater heights and with less resistance to brute force overload.[12] To the extent ATTWS and others operate in the WCS C and D bands, they will have even less spectral separation from the SDARS spectrum than the B band used by the equipment discussed in this letter. The Commission must assess the impact of SDARS repeaters upon the full range of WCS services authorized under its rules, and its assessment must be based not on what the current SDARS licensees say about what they intend to do today, but rather upon what a proposed rule would allow them to do in the future. Thus, while ATTWS believes that the analysis presented herein provides valuable data, the Commission should consider this information within the broader obligation to harmonize spectrum use among its licensees rather than allowing any one group to overpower another.

Data and Assumptions

ATTWS previously submitted a detailed technical analysis and assessment of the repeater authorization scheme proposed by the SDARS licensees.[13] The present analysis makes use of the repeater information provided by the SDARS licensees on March 8. That information included basic data for three cities – Boston, San Francisco and Atlanta. For purposes of the discussion below, ATTWS has focused on the data for Atlanta.[14] In its earlier submission,

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[11] *See* letter from William M. Wiltshire to Magalie Roman Salas, dated March 22, 2001.

[12] *See* Letter from John Tehan to Ron Repasi, dated March 8, 2001.

[13] *See* Letter from William M. Wiltshire to Magalie Roman Salas, dated February 20, 2001.

[14] Given the options, Atlanta seems the most practical for demonstration purposes. At present, Sirius proposes 5 transmitter sites in Atlanta and XM proposes 2, for a total of 7. In contrast, they propose a total

ATTWS used a free space path loss model to determine interference areas. In this analysis, we have used the deciBel Planner software package that the SDARS licensees asserted would provide a more accurate predictor of interference, taking into account factors that might mitigate signal propagation.

The following inputs are derived from the technical information exchanged by the parties in this proceeding.

For ATTWS:

- Two-way telecommunications system with transmit and receive antennas at both base station and receive unit ("RU").

- Base station sensitivity is –45.1 dBmi. Base station antenna is located at 30 meters HAAT. Sensitivity calculation is based on a signal at the front of the antenna. No antenna discrimination is assumed. The base station has 4 sectors covering 360º. Base station gain is 17 dBi.

- RU sensitivity is –58.6. RU antenna is located at 3 meters HAAT. There is no antenna discrimination because the RU will point in every direction. RU antenna gain is 14 dBi.

For SDARS terrestrial repeaters:

- One-way broadcast system with transmitter/repeater and mobile receive unit.

- Sirius proposes 5 high power repeaters and XM proposes 2 in the Atlanta market. Analysis includes high power (greater than 2 kW) repeaters only, and, accordingly, does not reflect interference from any number of 2 kW repeaters that may be planned.

- Repeater antenna heights range from 47 meters to 316 meters AGL, each as specified in the March 8 filings. Antenna locations are as specified in the March 8 filings.

- Power levels range from 6.3 kW to 12.6 kW per antenna. Sectorization and beamwidth are as specified in the March 8 filings.

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of 32 transmitter sites in Boston (31 for XM, 1 for Sirius) and three in San Francisco (2 for Sirius and 1 for XM). As Sirius noted in its recent letter (*see* Sirius Letter at p. 3), ATTWS was able to do some testing in the New York market; unfortunately, those tests related to RU performance only as conditions for base station units could not be replicated.

Following the initial exchange of data, ATTWS requested limited additional information necessary to perform a thorough analysis.[15] Because the information has not been supplied in over a month, ATTWS has made the following additional assumptions:

- In determining intended coverage areas for SDARS repeaters, we assume a desired minimum received signal strength at the SDARS receiver of –70 dBmi (based on oral representation at the March 1 meeting of technical representatives).
- We assume no antenna tilt for SDARS repeaters.
- We use the antenna patterns supplied by Sirius for both licensees.
- We assume SDARS receive antenna height of 1.5 meters, modeled on the roof height of a typical car.

Finally, for ease of calculation, we assume a 5 MHz bandwidth with power evenly distributed across the band. (In reality, interference from Sirius' repeaters is likely to be greater than represented here because the EIRP will be spread across a band that is only 3.9 MHz.)

Results and Conclusions

Based on the data and assumptions listed above, ATTWS has plotted SDARS coverage and interference areas in Atlanta. The results are graphically depicted in Attachment 3, Charts 1 through 7.

For purposes of comparison, the first charts demonstrate interference to the ATTWS base station and RU from the seven planned repeater sites, assuming operations at (1) 2 kW EIRP, (2) the power levels as stated in the March 8 submissions, and (3) 40 kW EIRP. The interference contours are plotted in Charts 1 and 2. Numerical results are as follows:

Terrestrial Repeaters

		7 @ 2 kW	7 @ proposed powers	7 @ 40 kW
Chart 1	Exclusion Zone for Base	82.0 sq. km	326.3 sq. km	827.9 sq. km
	households precluded	43,050	171,306	434,648
Chart 2	Exclusion Zone for RU	17.8 sq. km	56.0 sq. km	139.9 sq. km
	households precluded	9,345	29,400	73,448

Two observations are immediately apparent. First, were the SDARS licensees to operate as proposed in their non-binding submissions, ATTWS would be precluded from offering its competitive local access and broadband service to more than 170,000 households in Atlanta

[15] *See* letter from William M. Wiltshire to Magalie Roman Salas, dated March 22, 2001.

alone. Second, if the SDARS licensees chose to operate within the parameters of the rule they propose (up to 40 kW), the number of excluded households jumps beyond 400,000.[16]

Next, in order to assess the impact of replacing the seven repeaters proposed by Sirius and XM with 2 kW repeaters needed to provide service over the same coverage area, we determine the coverage provided by the current design. Charts 3 and 4 plot the coverage provided for Sirius and XM by the 7 proposed repeater sites operating at both 2 kW EIRP and at the proposed power levels. As these charts show, a single 2 kW repeater would be able to serve much of the same coverage area as the high power repeaters, but not the entire area. As shown in Chart 5, it would take approximately five 2 kW standard power repeaters to provide coverage comparable to each of the original high power repeaters.[17]

Based on the coverage data derived above, we plot a comparison of interference to the base station and the RU from the original 7 sites operating at the planned power levels with interference from the 35 replacement repeaters operating at 2 kW. The exclusion zones, depicted in Chart 6 (base) and Chart 7 (RU), are as follows:

Terrestrial Repeaters

		7 @ proposed powers	35 @ 2kW
Chart 6	Exclusion Zone for Base	326.3 sq. km	185.3 sq. km
	households precluded	171,075	97,282
Chart 7	Exclusion Zone for RU	56.0 sq. km	57.1 sq. km
	households precluded	29,400	29,977

Notably, for comparable SDARS coverage, use of multiple standard power repeaters in lieu of high power repeaters cuts interference to the base stations by a ratio of 1.76 to 1. The exclusion zone for the base station drops from 323 sq. km to 185.3 sq. km. Moreover, these figures do not reflect that, under the proposed rule, absolutely nothing limits the SDARS licensees from constructing additional repeaters or increasing power from a proposed 6.3 or 7.4 kW to 40 kW.

The results indicated above may also help to explain the almost total lack of agreement in the analyses previously submitted by the SDARS and WCS licensees. XM and Sirius have consistently maintained in this proceeding that WCS operators would suffer less interference from relatively fewer high power repeaters than they would suffer from the more numerous standard power repeaters that would be needed to provide the same signal coverage, while the WCS licensees have consistently maintained exactly the opposite position. The evaluation tool used by the SDARS licensees takes into account shielding from terrain, ground clutter, and other

[16] Of course, under the rule the licensees would not be limited to any particular number of high power repeaters in Atlanta, so this exclusion number could be even higher.

[17] This conclusion is consistent with the information submitted by XM in this proceeding. *See* Consolidated Reply of XM Radio, Inc. at p. 14 (Mar. 8, 2000).

factors that would tend to decrease interference into equipment operating near ground level – the height at which the SDARS licensees apparently assumed *all* WCS equipment would operate. The free space models used by the WCS licensees assume that line of sight conditions will be the more common situation for the base station. A look at the data above illustrates that both sides had a point. The ATTWS receiver units operating at a height of 3 meters would be excluded from a marginally larger interference zone using 2 kW repeaters than using the repeater powers currently planned. However, the base stations operating at a height of 30 meters would be excluded from a much larger interference zone for high power repeaters than for 2 kW repeaters needed to replace them. But because the analyses proffered to date by the SDARS licensees erroneously assumed operating heights that would lend themselves to natural shielding, their results wildly understate the impact of high power terrestrial repeaters on WCS networks.

PROPOSED RULE

Based on the demonstrated interference potential of high power terrestrial repeaters and several other matters of record in this proceeding, ATTWS proposes that the Commission adopt the rule set forth in Attachment 1.[18] The proposed rule has three main components.

First, the rule would limit SDARS repeaters to peak EIRP levels of no more than 400 W/MHz, evenly distributed across the band, for a total of 2 kW per 5 MHz of repeater spectrum. This would place SDARS repeaters on a par with the EIRP limitations placed on WCS operators and allow them to operate, as XM admits, "as a power level that is completely standard in this part of the spectrum."[19]

Second, the rule would codify the out of band emissions limitation of 75 + 10 log(p) dB that the SDARS licensees have voluntarily adopted in designing their networks. Although this limitation is not as stringent as the 80 + 10 log(p) dB limitation that WCS operators with fixed networks must meet to protect SDARS spectrum use, ATTWS believes that it is nonetheless sufficient. As ATTWS has previously noted, however, limitations on out of band emissions do not address the blanketing interference caused by the overloading signals of high power repeaters.

Third, the rule would codify both an international agreement with Mexico[20] and the current designs of the SDARS licensees by specifying the SDARS spectrum that may be used for terrestrial repeater operations. This is necessary to ensure that the interference environment is not altered by, for example, expanding the amount of spectrum used for terrestrial as opposed to satellite operations or relocating the repeater spectrum to the edge of the SDARS band contiguous with WCS operations. Since this part of the rule would do no more than codify the

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[18] The proposed rule addresses only interference concerns related to WCS systems, and is not intended to address any additional concerns that may also need to be addressed in connection with MDS/ITFS operations, international coordination, antenna structure registration, or environmental processing.

[19] *See* XM Letter at p. 2.

[20] *See* Agreement Between the Government of the United States of America and the Government of the United Mexican States Concerning the Use of the 2310-2360 MHz Band, at Appendix 1 (July 24, 2000).

designs proposed to the Commission by the SDARS licensees, which were also the basis for an international coordination agreement with Mexico, compliance should not be an issue.

As indicated in its prior filings in this proceeding, ATTWS believes that all licensees in the 2.3 GHz band would be well served by a rule setting out reciprocal inter- and intra-service notification and coordination procedures for any transmitter operating at a peak EIRP level greater than 200 W that will optimize the overall performance of all WCS and SDARS systems without imposing too great an administrative burden. Because at least part of such a rule falls outside the scope of this proceeding, no such provision has been included in the rule proposed herein. However, ATTWS would encourage the Commission to initiate a rulemaking to adopt such a notification and coordination requirement in this band at its earliest opportunity.

RESPONSE TO THE SIRIUS AND XM LETTERS

Although the parties exchanged technical data over a month and a half ago, the Sirius Letter and the XM Letter notably lack ***any*** analysis of the type presented herein that uses that data to assess the level of interference that will be caused by high power repeaters. This lack of analysis is particularly telling given that the SDARS licensees have all of the data on their repeater networks (even the information they would not share with the WCS licensees), the deciBel Planner prediction tools and the related data necessary to run that analysis for each of their target markets, and all of the relevant data for the networks of three WCS licensees. If harmful interference would not result from the high power deployment, they could easily have plugged this data into their models and demonstrated that fact – and presumably would have done so, as Sirius attempted to do (without explaining its methodology) in its February 5 submission.[21] They most obviously have chosen not to do so. In fact, as more and more data has become available on WCS network deployment, less and less technical analysis has been forthcoming from the SDARS licensees. This omission speaks volumes about their assertions on the technical merits of the case. Having come to a conclusion based on demonstrably erroneous assumptions about the types of networks WCS operators would deploy, they are unwilling to recognize the conclusions that must be reached when their methodology is corrected by using more reliable data. ***In other words, the SDARS licensees have not presented an analysis of the data because to do so would be to prove the WCS licensees' point.***

Rather than actually analyze the technical information exchanged by the parties in order to determine the scope of harmful interference that high power terrestrial repeaters would cause, Sirius and XM have instead resorted primarily to an *ad hominem* attack on the design of WCS equipment. Perhaps they are under the mistaken impression that this proceeding relates to the rules governing WCS equipment, when in fact those rules have been in place for almost four years and cannot be changed in this proceeding.[22] While WCS licensees are conforming to ***rules***, SDARS licensees are advocating a ***proposal*** – and that is the issue here. Curiously, Sirius

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[21] *See* letter from Carl R. Frank to Magalie Roman Salas (dated February 5, 2001).

[22] *See, e.g., Reeder v. FCC*, 865 F.2d 1298, 1304-05 (D.C. Cir. 1989)(remanding rulemaking where Commission abandoned established practice without notice that it was planning to do so).

asserts that "interference from adjacent terrestrial repeaters should have – and easily could have – been avoided by the WCS licensees through compliance with existing rules."[23] Putting aside the irony of a fledgling satellite licensee presuming to advise some of the most experienced operators of terrestrial wireless services on how best to design their WCS networks and equipment, Sirius' statement still makes no sense. The WCS equipment being deployed by ATTWS and other WCS licensees has already been approved by the Commission and meets each and every requirement established under the Commission's rules. ATTWS designed its WCS equipment based on proven, state-of-the-art technologies developed and successfully deployed in the Personal Communications Service. The Commission should not let itself be distracted by this irrelevant argument that clearly falls beyond the scope of this proceeding.

Moreover, the assertions made in the Sirius Letter and the XM Letter range from somewhat misleading to flat out wrong. For example, Sirius asserts in general that "the WCS licensees are building receivers that have *no* protection against overload (*i.e.*, receiver linearity) and *no* front-end selectivity," and that ATTWS in particular "has no filtering to eliminate DARS transmissions in the 2320-2345 MHz band."[24] XM similarly asserts that ATTWS' equipment "has no filtering to eliminate DARS transmissions in the 2320-2345 MHz band."[25] This is simply false. ATTWS' equipment is designed to tolerate a signal from the SDARS band that is 70 dB stronger than the level of the signal it receives from the RU. Thus, there is significant filtering capability – but not enough to avoid overload by a transmitter in a nearby band operating at up to 20 times higher power.

Sirius also asserts that ATTWS' use of a 1 dB noise floor rise as a threshold for interference is "wholly unrealistic."[26] Like any other wireless operator, ATTWS models its network to achieve the optimal and most spectrally efficient cell structure possible. However, a 1 dB increase equates to a loss of approximately 10% of the coverage area of the WCS base station.[27] If individual cells are reduced in size by 10%, the network develops gaps and makes less efficient use of valuable spectrum resources. Thus, the 1 dB noise floor rise is clearly an appropriate and cognizable level of interference for purposes of this analysis.

Sirius asserts that none of the WCS engineers could explain why a free space path loss model would be appropriate to estimate interference in this case.[28] To the contrary, the WCS engineers tried repeatedly to explain that, because WCS base stations will be located at heights

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23 Sirius Letter at p. 3.

24 Sirius Letter at p. 2 and n.4.

25 XM Letter at p. 1.

26 Sirius Letter at p. 3.

27 For every dB of noise floor rise, there must be one dB of signal strength increase to be able to demodulate the desired signal. Looked at another way, one dB of noise floor rise is like gaining one dB of path loss. If a free space path loss model is used at a frequency of 2.34 GHz and the cell radius is set to 1.5 km, the path loss will be 103.35 dB and the area covered will be 7.07 km^2. With a 1 dB noise floor rise, the usable path loss becomes 102.35 dB, reducing the cell size to a radius of 1.337 km and the coverage area to 5.62 km^2 – a 21% reduction. AT&T's proprietary propagation model, which is more accurately tuned, indicates that a 1 dB noise floor rise decreases the coverage area of a WCS base station by 10% rather than 21%.

28 Sirius Letter. at p. 3.

from 30 meters up to several hundred meters, they likely would have line-of-sight (and perhaps even boresight) paths to the SDARS repeaters in most cases. This assertion has been proven valid by the fact that, even using the non-free-space-based software advocated by the SDARS licensees, the circular interference patterns characteristic of free space models are evident in the base station plots. Sirius also asserts that "the WCS licensees agreed with Sirius that the height/antenna discrimination between satellite DARS terrestrial repeaters and WCS receivers would reduce overload interference to a reasonable level."[29] To the contrary, the WCS licensees strenuously disagreed with this assertion by Sirius when it was first made at the March 1 meeting, again based on the heights at which their equipment would be deployed. Apparently, despite the exchange of data and the explanations of the WCS engineers, Sirius simply refuses to acknowledge these facts.

Sirius asserts that "ATTWS already has confirmed that it will redesign its receivers to accommodate the interference" from high power repeaters.[30] While ATTWS is continuing to review options for making its equipment more resistant to interference, it has already concluded that there is no economically viable option that would achieve the resistance that would be necessitated by the deployment of high power terrestrial repeaters operating at up to 40 kW. Furthermore, Sirius has again missed the point. ATTWS' existing equipment complies with all of the Commission's rules and requirements, and neither it nor any other or future WCS licensee should be foreclosed from providing service in conformance with its license just for the convenience of Sirius.

Finally, Sirius characterizes as an "unreasonable request" the proposition that SDARS licensees should accommodate flexible deployment of WCS networks.[31] The real question is whether the Commission will allow SDARS operators to dictate what types of services may be provided by WCS operators and what types of equipment they must use to do so. The Commission established WCS as the prototype flexible-use service wherein the market is allowed to make spectrum use decisions within the confines of established technical rules.[32] Parts 15 and 27 of the Commission's rules already define the requirements for WCS operations. XM and Sirius have no business attempting to impose additional requirements unilaterally that would undercut the Commission's flexible use policies.[33] If the Commission is serious about

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29 *Id.* at p. 4.

30 *Id.* at p. 3.

31 *Id.* at p. 4.

32 *See Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service*, 12 FCC Rcd. 10785, 10798 (1997)("Permitting a broad range of services to be provided on this spectrum will permit the development and deployment of new telecommunications services and products to consumers. Moreover, WCS licensees will not be constrained to a single use of this spectrum and, therefore, may offer a mix of services and technologies to their customers.").

33 The Commission has increasingly stated a preference for flexible use spectrum allocations. *See, e.g., Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules*, 15 FCC Rcd. 476, 478 (2000)(finding "that a flexible, market-based approach is the most appropriate method for determining service rules in this band"); *Principles for Reallocation of Spectrum to Encourage the Development of Telecommunications Technology for the New Millenium*, 14 FCC Rcd. 19868, 19870 (1999)("Flexible allocations may result in more efficient spectrum markets").

allocating spectrum on a flexible use basis in the future, it must protect service provider options against such incursions. That is an eminently reasonable request.

In this proceeding, Sirius and XM have stated that they will need to deploy approximately 105 and 150 high power repeaters, respectively, for a total of 255.[34] Yet in their latest proposals, they would authorize themselves to deploy a total of 300 and 500 high power repeaters, respectively, without any coordination whatsoever. Such a rule would allow them to deploy all of the high power repeaters they currently envision without coordination and still leave enough additional "as of right" high power repeaters to effectively trump any coordination process for years to come, even if future deployment would demonstrably cause harmful interference to WCS networks. Such a rule would expose WCS networks to ongoing and unlimited risk, and must be rejected by the Commission.

CONCLUSION

The technical data available in this docket now establishes beyond question that high power SDARS repeaters will cause much more interference to WCS operations than would the use of standard power repeaters. The Commission should adopt rules that do not compromise the WCS service in general or prevent ATTWS in particular from achieving the Commission's goal of providing another facilities-based local exchange and broadband access service. It should not, as the SDARS licensees advocate, adopt rules that would effectively render WCS services perpetually secondary in their own band.

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[34] *See, e.g.,* Supplemental Comments of Sirius Satellite Radio at Exhibit 4, p. 3 (Jan. 18, 2000); Supplemental Comments of XM Radio Inc. at p. 3 (Dec. 17, 1999). We note that, in a recent filing with the Securities and Exchange Commission, Sirius indicated that it would deploy approximately 94 terrestrial repeaters. *See* Prospectus Supplement for Sirius Satellite Radio, Inc. at p. S-23 (filed Feb. 26, 2001).

In accordance with Commission rules, this letter is being filed electronically in the above-captioned docket.

Respectfully submitted,

William M. Wiltshire
Karen L. Gulick
Counsel for AT&T Wireless Services, Inc.

Attachment 1 (proposed rule)
Attachment 2 (2.3 GHz band plan)
Attachment 3 (Charts 1 through 7)

cc: Ron Repasi
Ron Netro
Rockie Patterson
Rosalee Chiara
Chris Murphy
Julius Knapp
James Schlicting
Kathleen O'Brien-Ham
Carl Frank
Bruce Jacobs

ATTACHMENT 1

Proposed Rule Changes – Part 25

§ 25.144 Licensing provisions for the 2.3 GHz satellite digital audio radio service.

(a) – (d) [same]

(e) *Licensing of satellite DARS terrestrial repeaters*. Satellite digital audio radio service licensees may construct and operate terrestrial transmitters ("terrestrial repeaters") in accordance with the provisions of this section.

(1) *Purpose*. Terrestrial repeaters may be used to provide services complementary to satellite services in areas where the satellite signal experiences gaps in coverage due to signal blockage. Terrestrial repeaters shall not be used to originate programming not also transmitted from the licensee's authorized digital audio radio satellites.

(2) *Spectrum usage*. Terrestrial repeaters may be operated in the following bands: (1) for the license at 2320 MHz to 2332.5 MHz, 2324.2 MHz to 2328.3 MHz may be used for terrestrial repeaters; (2) for the license at 2332.5 MHz to 2345 MHz, 2336.225 MHz to 2341.285 MHz may be used for terrestrial repeaters.

(3) *Technical standards*.

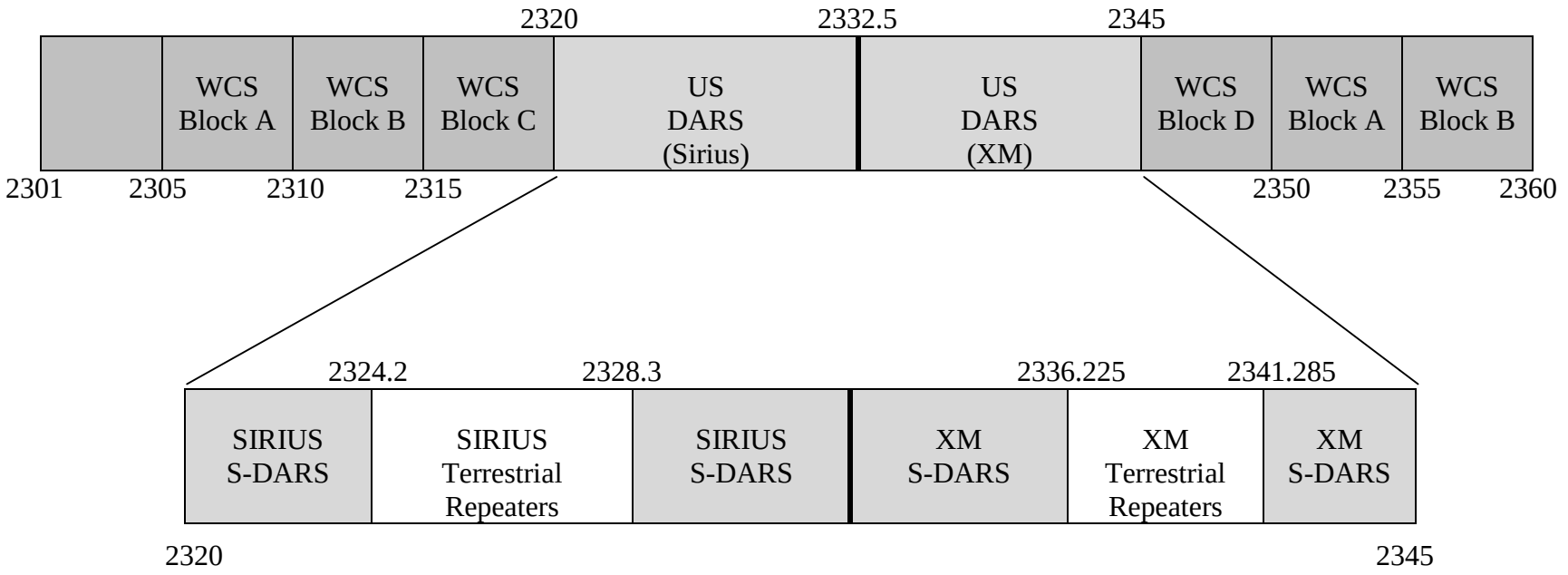
(A) Out of band emissions generated by terrestrial repeaters shall be limited to 75 + 10 log(p) dB less than the transmitter EIRP (p is the EIRP in watts).

(B) Each terrestrial repeater may operate at a peak EIRP of up to 400 W/MHz, determined using a calibrated field measurement set to measure 4 kHz intervals.

ATTACHMENT 2

2.3 GHz BAND PLAN

2.3 GHz Band

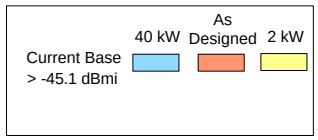

2320
2332.5
2345
WCS Block A
WCS Block B
WCS Block C
US DARS (Sirius)
US DARS (XM)
WCS Block D
WCS Block A
WCS Block B
2301
2305
2310
2315
2350
2355
2360
2324.2
2328.3
2336.225
2341.285
SIRIUS S-DARS
SIRIUS Terrestrial Repeaters
SIRIUS S-DARS
XM S-DARS
XM Terrestrial Repeaters
XM S-DARS
2320
2345

ATTACHMENT 3

SUMMARY CHARTS 1 - 7

Chart 1

Interference from DARS Repeaters at 2kW, 40 kW and Intended Power Levels to ATTWS Base



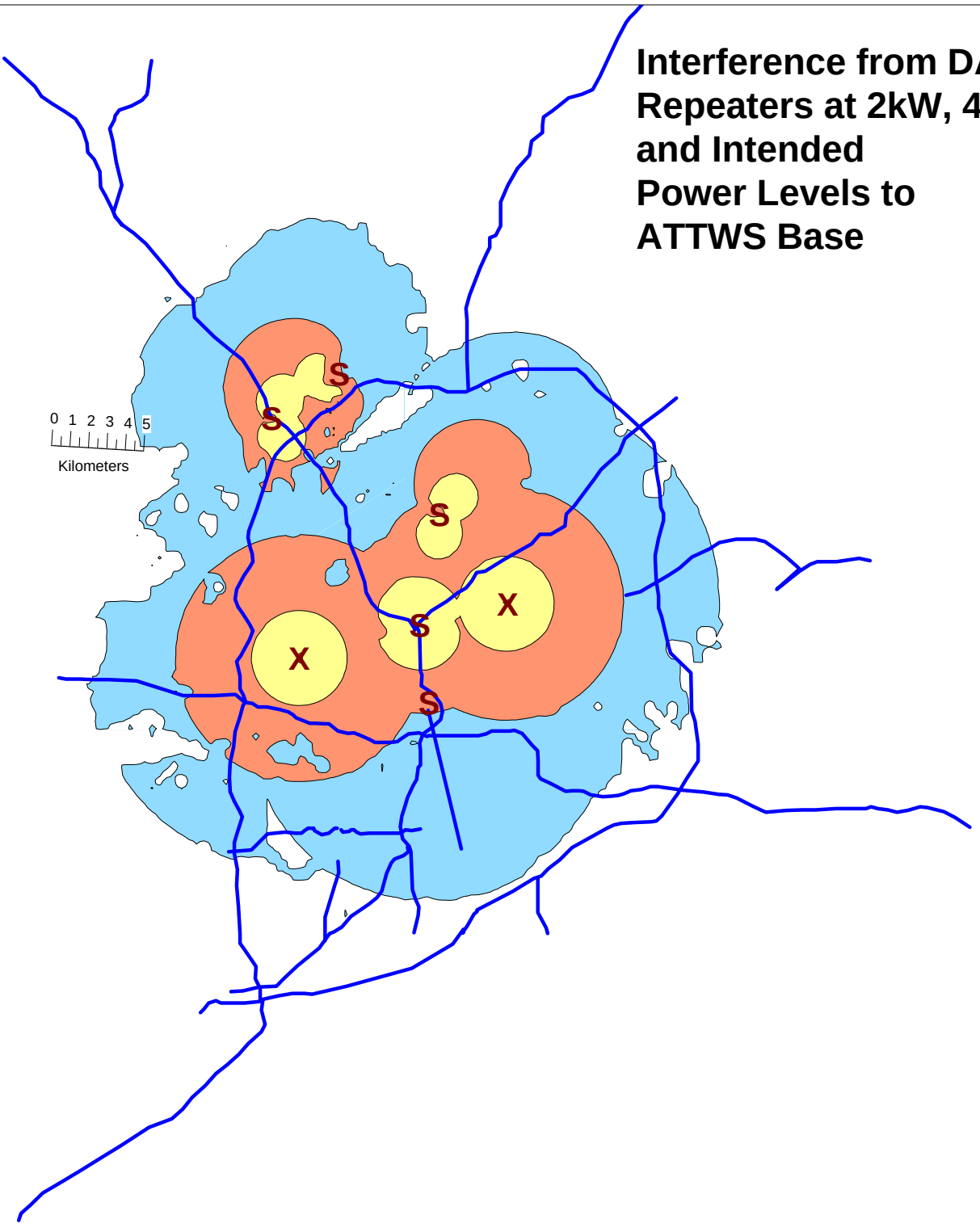


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Chart 2

Interference from DARS Repeaters at 2 kW, 40 kW and Intended Power Levels to ATTWS Remote Unit

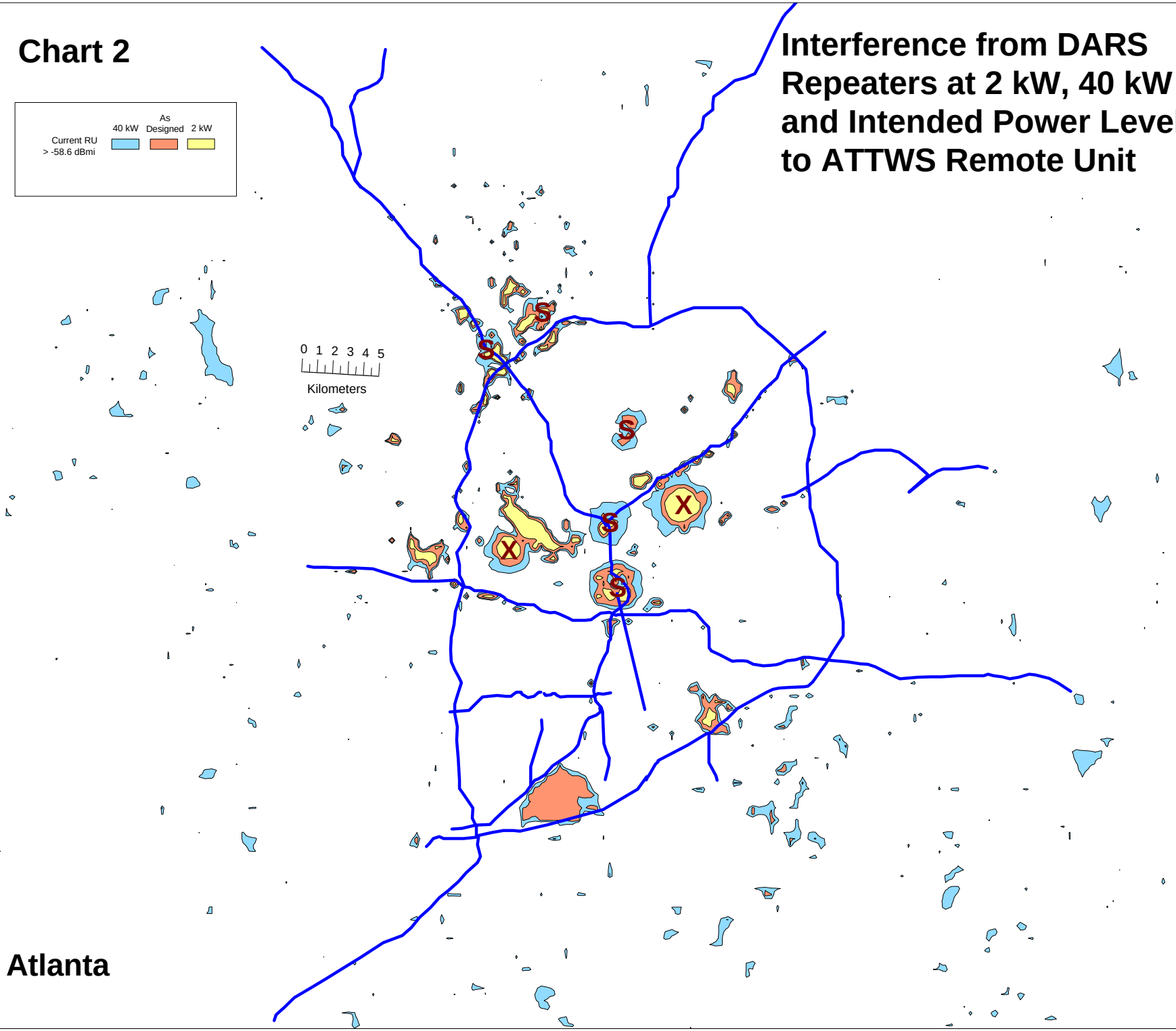

Chart 3

Sirius Coverage Provided by DARS Repeaters

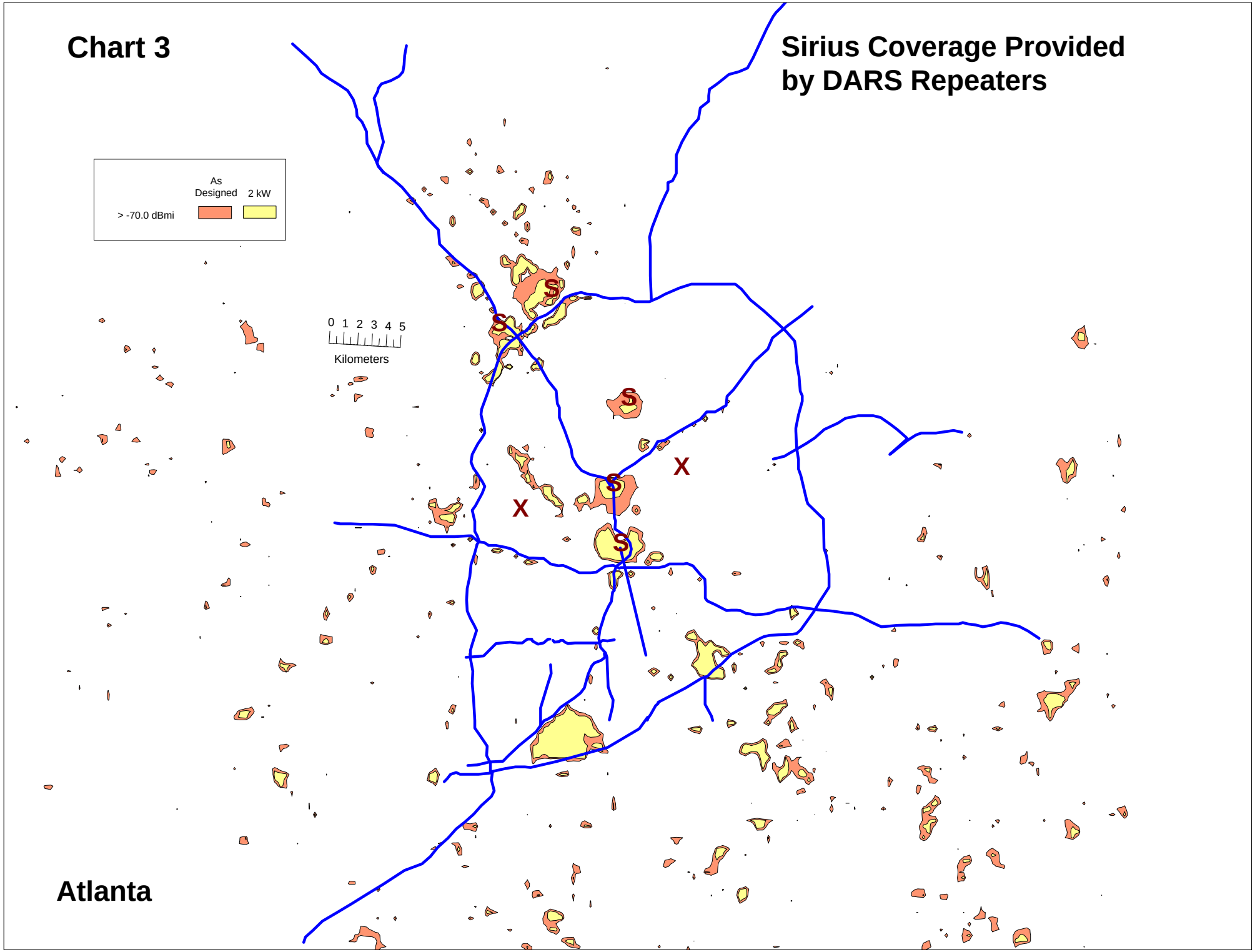

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Chart 4

XM Coverage Provided by DARS Repeaters

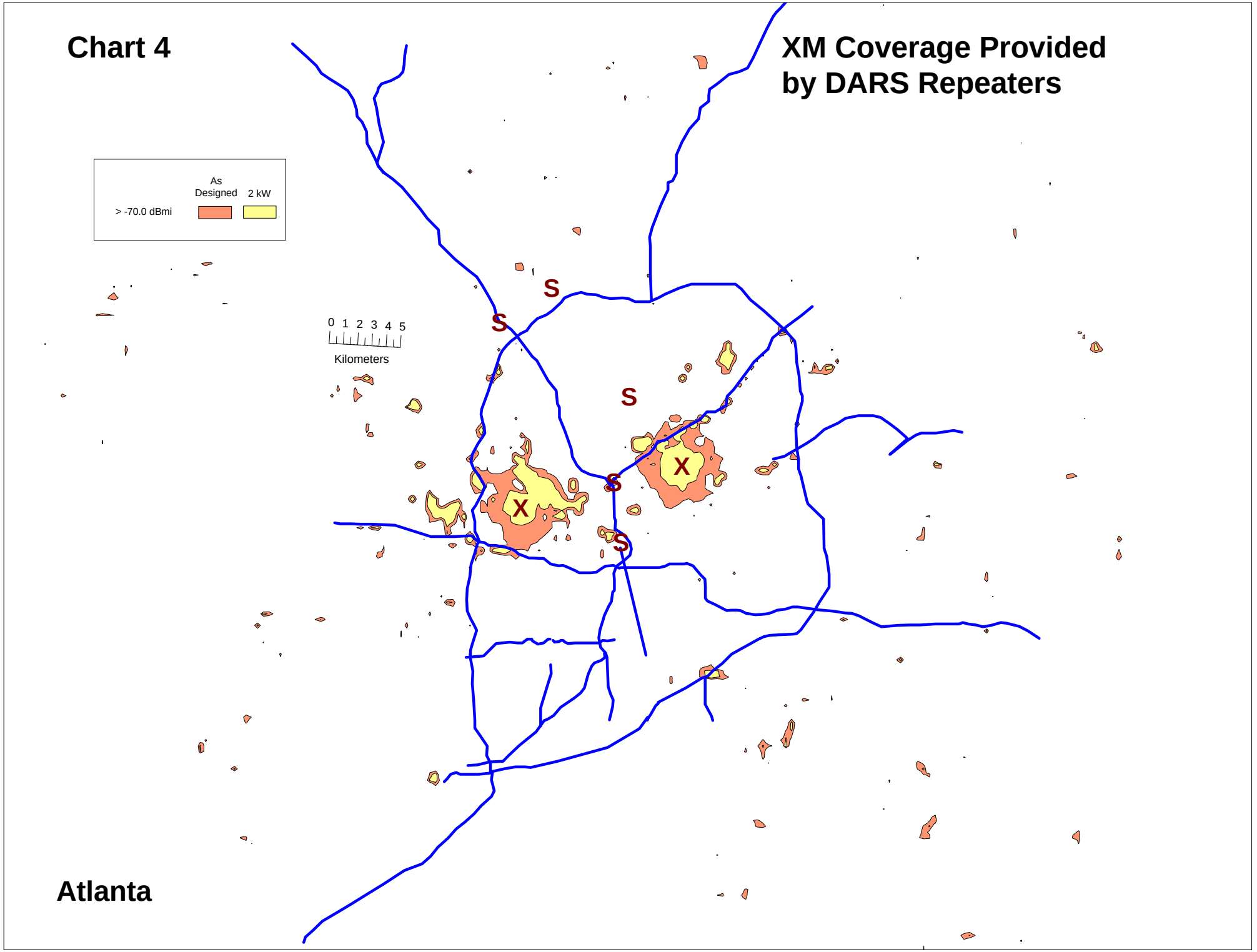

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Chart 5

XM and Sirius Coverage Comparison
7 original sites at Intended Power Levels and 35 sites at 2 kW each

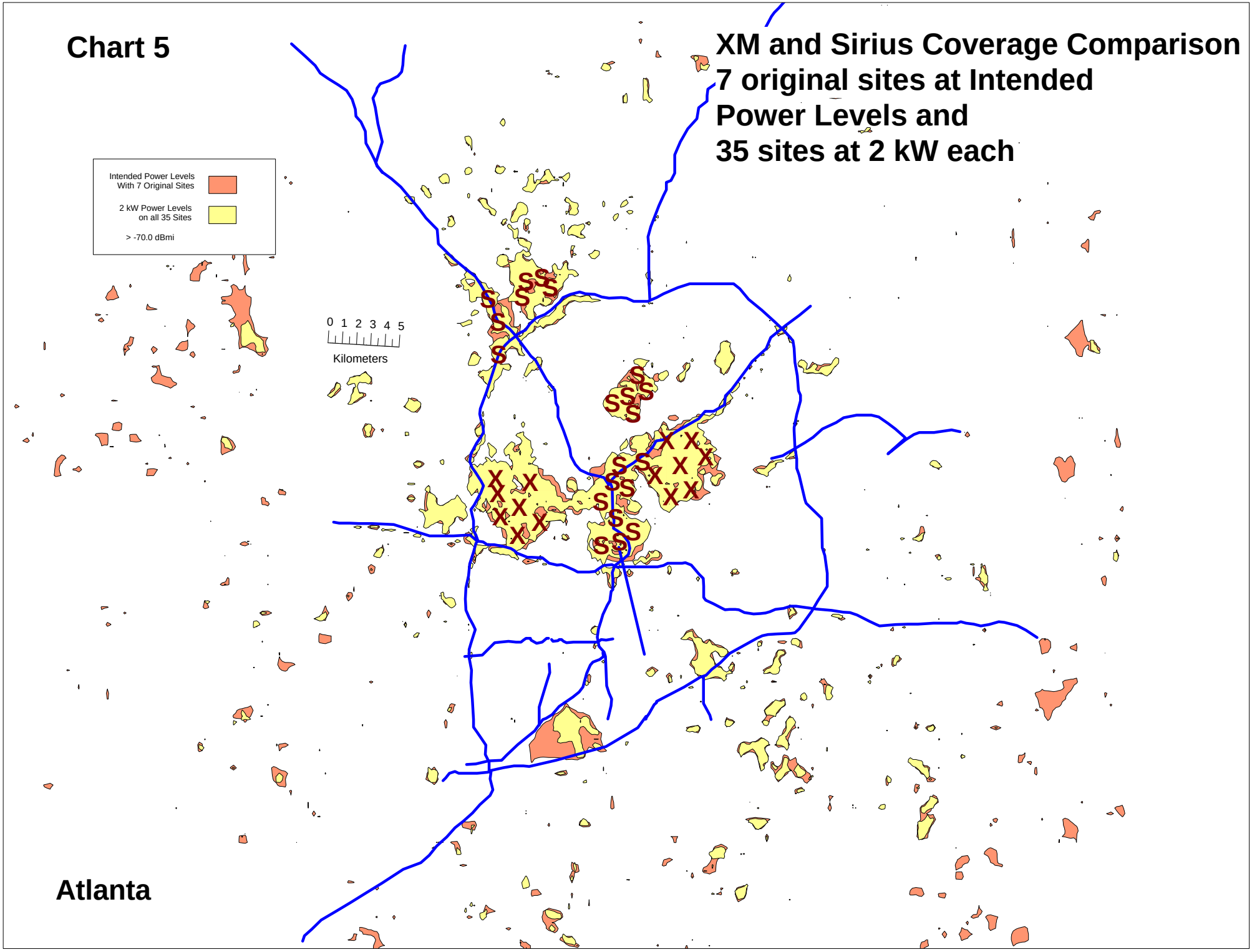

Chart 6

XM and Sirius Repeater Interference to the ATTWS Base
7 original sites at 40 kW Power Levels
7 original sites at Intended Power Levels
35 sites at 2 kW Power Levels

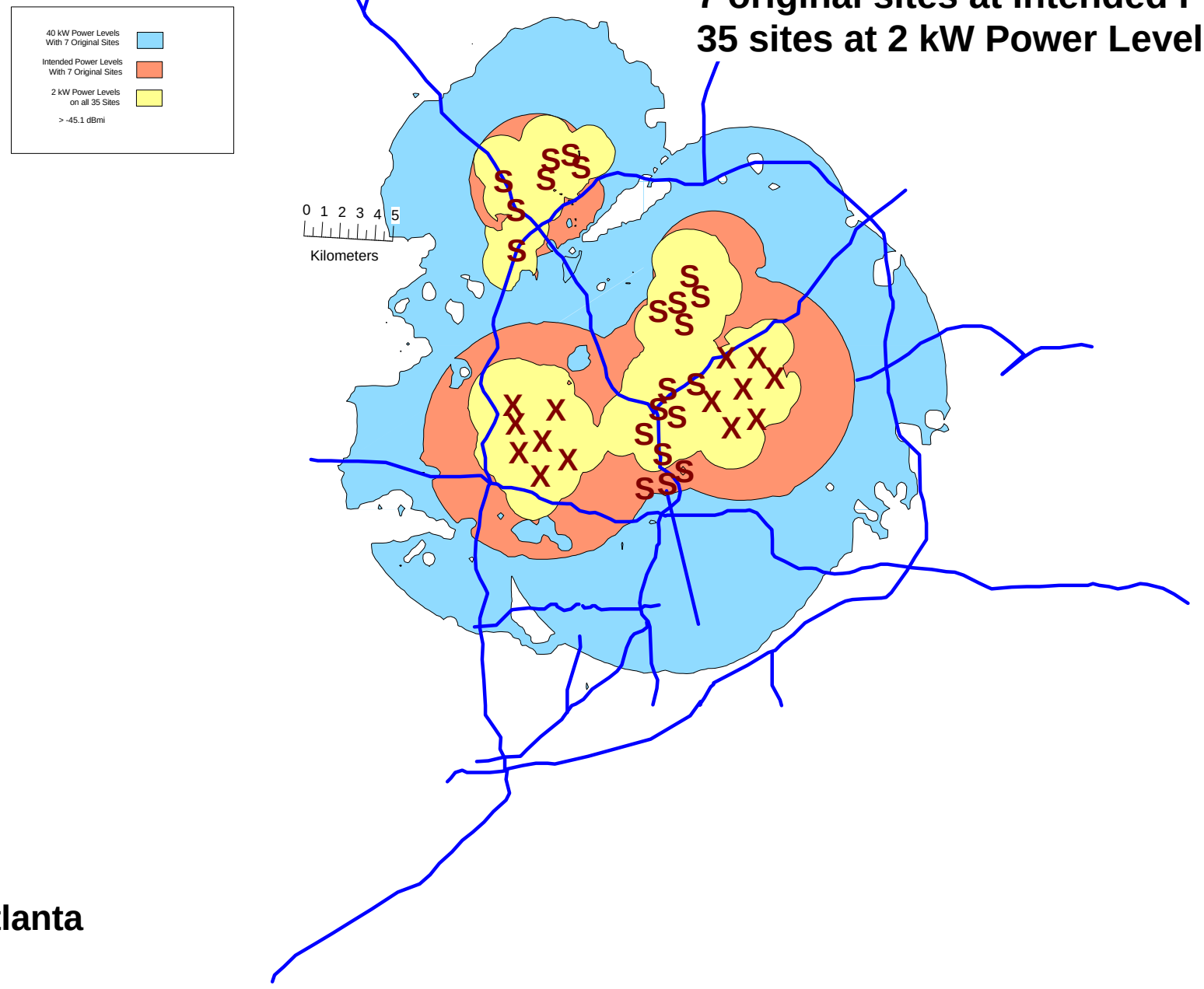

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Chart 7

XM and Sirius Repeater Interference to the ATTWS RU 7 original sites at Intended Power Levels and 35 sites at 2 kW each