STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

RE: APPLICATION BY T-MOBILE NORTHEAST LLC FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR A TELECOMMUNICATIONS FACILITY AT 158 EDISON ROAD IN THE TOWN OF TRUMBULL, CONNECTICUT

DOCKET NO. 421

Date: November 29, 2011

INTERROGATORY RESPONSES TO CITIZENS AGAINST TRUMBULL TOWER FROM APPLICANT T-MOBILE NORTHEAST LLC

The Applicant, T-Mobile Northeast LLC ("T-Mobile"), submits the following responses to the first set of Pre-Hearing Interrogatories propounded by the Citizens Against Trumbull Tower in connection with the above-captioned Application.

1. What propagation model did the applicant employ to determine calculated coverage?

A1 T-Mobile utilizes the Myriad propagation model.

2. What is the frequency band that is depicted in these plots?

A2 The frequency depicted in T-Mobile's propagation plots is 1950.000 MHz.

3. What clutter model and what terrain data base were utilized in these calculations?

A3 T-Mobile objects to this Interrogatory because it seeks proprietary information. Notwithstanding this objection, T-Mobile provides the following information: T-Mobile uses a coverage planning tool, which is known as Asset. This coverage planning tool is used by the top wireless carriers all over the world.

4. What effective radiated power and antenna type along with beam tilt, if applicable, were utilized in these calculations?

A4 Please see table of parameters listed in this Interrogatory related to the proposed telecommunications facility at 158 Edison Road, Trumbull, Connecticut ("Facility") and each adjacent telecommunications facility appended hereto as Attachment A.

5. Were drive tests ("scan tests") that would verify the results of the calculated plots conducted? If so, please provide the data sets which were generated by the tests and note whether the data needs to be corrected for variables including, but not limited to, antenna position, gain and line loss.

A5 T-Mobile does not have any recent scan data regarding this particular area of the Town. Please refer to the following for the data in support of T-Mobile's need for the proposed Facility: Application, Exhibit H (propagation plots); the Pre-Filed Testimony of Scott Heffernan; and T-Mobile's Responses to the Connecticut Siting Council's ("Council") First Set of Interrogatories.

6. Have you performed continuous wave ("CW') tests from the proposed site or any other site either identified or considered?

A6 T-Mobile did not perform any continuous wave tests with respect to the proposed Facility.

7. In calculating the expected coverage from the proposed site, what antenna centerlines, antenna types and effective radiated power did the applicant assume would be put in use?

A7 Please see table of parameters listed in this Interrogatory related to the proposed Facility and each adjacent telecommunications facility appended hereto as Attachment A.

8. Have you performed a minimum height analysis to determine the minimum antenna centerline that you require to meet your alleged coverage needs?

A8 Yes. T-Mobile's analysis confirmed that the minimum height required to achieve the coverage objective is 140 feet above grade level ("AGL"). At lower heights, the coverage would start to deteriorate below T-Mobile's minimum required threshold of -84dBm. Please see T-Mobile's responses to the Council's First Set of Interrogatories.

8a. Have you generated or reviewed any coverage maps generated by others which depict current and/or proposed coverage for the municipal arrays proposed to be placed at the top of the tower? If so, please provide a copy of the same.

A8a T-Mobile has not generated any coverage maps or reviewed any coverage maps generated by others regarding the Town of Trumbull's ("Town") proposed emergency communications antennas. See Pre-Filed Testimony of Eric Fine regarding the Town's need for improved and additional emergency communications service.

9. By what method was it determined that identified alternate sites did not meet the needs of the Applicant? If studies were conducted to confirm the utility of the alternate sites, please provide copies of those studies?

A9 T-Mobile is sensitive to State and local desires to minimize the construction of new facilities, and it does not pursue development of a new facility where an acceptable existing structure can be found. In general, T-Mobile's site acquisition personnel study the target area to determine whether any suitable structures exist. If T-Mobile cannot find a structure with appropriate height and structural capabilities, it turns to industrial / commercial areas or individual parcels with appropriate environmental and land use characteristics. Potential locations are limited by the willingness of property owners to make their property available. Radio frequency ("RF") engineers study potentially suitable and available locations to determine whether the locations will meet the technical requirements for a site in the area. Analysis of potential environmental effects and benefits may further narrow the alternatives. The weight given relevant factors varies for each search, depending on the nature of the area and the availability of potential sites. See Application, Exhibit J.

10. What antenna centerlines, antenna types and effective radiated power did the applicant assume to determine expected coverage from alternate sites indicated?

A10 T-Mobile evaluated the parcels listed in the Application, Exhibit J, as possible alternative sites for a telecommunications facility. Those parcels, however, were not available to T-Mobile as viable alternatives to the proposed site for the reasons listed in Exhibit J. Accordingly, T-Mobile did not perform any additional assessments regarding the configuration of a possible telecommunications facility located on those parcels.

11. Is there another combination of alternate sites that could be utilized to achieve the alleged coverage needs?

A11 Any combination of alternative sites would require another telecommunications facility constructed on another property. T-Mobile conducted an extensive site search of the area incorporating the coverage objective and did not locate any other feasible site alternatives. There are no other existing structures in which T-Mobile could locate antennas within the vicinity of the coverage gap. See Application, Exhibit J; see also Pre-filed testimony of Raymond Vergati.

12. What alternate means of achieving the alleged coverage needs have been explored? Please provide any studies upon which you relied in making this determination.

A12 The coverage objective is extensive and, thus, requires a macro facility. Alternative deployment methods would not achieve the coverage objective.

13. Does the applicant possess any data that support either dropped calls, customer complaints or other switch based or customer service representative based information that supports its claim of lack of service in the entire area that it claims it has a coverage issue?

A13 T-Mobile objects to this Interrogatory to the extent it seeks the disclosure of information concerning customer complaints or related information because such information is proprietary. Notwithstanding this objection, T-Mobile provides the following response:

The average dropped call rate is 2.21 percent for the cells leading into the existing coverage gap that the proposed Facility would alleviate.

It should be noted that dropped call data is anecdotal in nature and not statistically reliable to design an advanced wireless network. Experience has demonstrated that customers will refuse to initiate a call or voluntarily terminate a call prior to dropping the call once they know an area has unreliable service. Customers will also change wireless companies if they experience unreliable service in a given area resulting in fewer customers and less dropped calls. Therefore, dropped call data typically underestimates the problem and is not a reliable methodology for determining whether there is a significant gap in reliable service.

Additionally, T-Mobile designs its network based upon known coverage criteria. Although customer complaints are very important to T-Mobile, such information is often vague and not location specific. Many customer complaints are reported hours or days after the incident. Thus, customer complaints do not constitute an exclusive or primary basis of need.

14. Are there other sites in Trumbull at which you are considering developing wireless communications facilities? Please describe.

A14 T-Mobile is not considering any other sites for development at this time.

15. Please name all carriers with whom you have reason to believe will co-locate on the proposed facility.

A15 No other wireless carrier has expressed an interest in co-locating on the proposed Facility at this time.

16. Please identify the size of the search ring and explain why that radius was chosen and where the ring was centered.

A16 The center of the search area was between Route 111 (Main Street) and Route 127 (Church Hill Road) in the area of Middlebrooks Avenue and Island Brook Park. The search area radius was approximately 1.0 mile. The "search ring" was a starting point to find an appropriate location for a telecommunications facility which would achieve the coverage objective.

17. What is the percent of dropped calls in the target area?

A17 See T-Mobile's response to Interrogatory 13, above.

18. If you conducted any drive tests, please produce the results of those drive tests?

A18 See T-Mobile's response to Interrogatories 5 and 6, above.

19. In any coverage simulations what angle of downtilt was assumed for each facility depicted in the coverage map generation?

A19 Please see table of parameters listed in this Interrogatory related to the proposed Facility and each adjacent telecommunications facility appended hereto as Attachment A.

20. Please describe the methods used by your visual impact consultant to calculate seasonal visibility.

A20 Please see the Application, Exhibit N.

21. What studies did you undertake to eliminate alternate technologies (e.g: DAS) from consideration given that they are of lesser impact to surrounding property uses?

A21 T-Mobile objects to this Interrogatory to the extent it asserts a particular legal or factual position; specifically, the Interrogatory posits a particular characterization of certain alternative technologies. T-Mobile also objects to this Interrogatory because any requirement or preference for alternative technologies is preempted by federal law; accordingly, any action by a state or local government entity to dictate or encourage the adoption of alternative technologies interferes with the federal regulatory scheme and is preempted. Without waiver of its rights under federal law, T-Mobile voluntarily provides the following information, responsive to this interrogatory.

T-Mobile assessed its need in the area surrounding the proposed Facility and determined that a macro-site (raw-land build) would be necessary to achieve the coverage objective. This assessment is premised upon T-Mobile's analysis of the nature of the coverage objective.

Repeaters would not serve as a feasible alternative technology because of the size of the coverage objective, the geography and the lack of existing structures to mount the repeater antennas. Repeaters are better suited to extend an existing footprint than to create a new coverage footprint.
An Outdoor Distributed Antenna System ("Outdoor DAS") is also not a viable alternative to the proposed Facility. The area to be served by the proposed Facility encompasses a large area, including Leetes Island Road (Route 146) and Pleasant Point Road, south of Interstate 95, as well as the surrounding area and the Amtrak rail line that passes through the area. While it is difficult to respond to this interrogatory with specificity due to the absence of an existing concrete Outdoor DAS plan, based on a review of the existing conditions found in the area where the Facility is proposed, an Outdoor DAS system faces a panoply of technical problems, including, but not limited to:

(A) The unavailability of a sufficient number of existing utility poles on which to string fiber-optic cable and install Outdoor DAS nodes;

(B) The general, relatively low height of those utility poles that do exist and might be used for the Outdoor DAS nodes;

(C) The existing, uneven terrain and mature vegetation, which would prevent Outdoor DAS nodes from providing reliable coverage throughout the area where there is currently a gap in coverage;

(D) The unavailability of unused fiber-optic cables (dark fiber), to serve as the backbone for the Outdoor DAS network; and

(E) The need to access easements, enter pole attachment agreements to use the various utility poles, and/or secure conduit agreements, the complexity of which is compounded by the large number of Outdoor DAS nodes necessary to provide reliable wireless service over the coverage area which the proposed Facility is designed to serve.

In designing Outdoor DAS systems, these items and others must be studied before any technical design can be performed. Failure to do so can cause a major flaw in the Outdoor DAS network design relative to coverage and capacity. It is for these reasons that Outdoor DAS networks are typically deployed only in limited circumstances where a traditional macro-cell site cannot provide reliable coverage and an Outdoor DAS system is shown to be a better alternative. Furthermore, today's wireless systems provide enhanced communications beyond just voice along the roadways or transportation corridors, such as the Amtrak line. The demand to

provide reliable in-building coverage for voice and data communications, as well as to provide for enhanced 911 access, is a paramount requirement in today's wireless environment.

As a general overview, in an Outdoor DAS system, the base station equipment is located at the end of the fiber run(s). The information is then transferred from pole to pole via fiber-optic cable from a base station hotel to each of the pole attachments. In essence, the wireless system becomes a mesh of wires connecting all of the end points or "nodes." Ultimately, what started out as a wireless system becomes a hybrid wired/wireless network. Moreover, Outdoor DAS systems generally rely upon low-powered nodes (with the available output power at each node shared by one or more wireless carriers) that use short omni-directional antennas or lower gain panel antennas with limited choices for patterns. These limitations make it difficult for a carrier to maintain control over the design and optimization of a wireless network. By contrast, traditional macro-cell site architecture allows a wireless provider to use directional antennas, specific antenna patterns, and customized orientation or down tilt to allow for optimum coverage and minimal interference. Using antennas that can focus in on one specific direction, also known as "sectorization," is especially important to avoid interference over 3G wideband CDMA networks like the one T-Mobile operates.

Additionally, T-Mobile provides wireless services to customers using a national network of more than 40,000 independent cell sites. T-Mobile is not a certified telecommunications provider in Connecticut, and thus it does not possess the regulatory authority necessary to secure pole attachment rights and/or gain access easements, both of which would be critical in constructing an Outdoor DAS system in the area in question.

The combination of these factors makes the operation of a DAS network over such a large geographic open area infeasible, especially for T-Mobile, and these issues are thus among the many reasons why most DAS networks are deployed in controlled / confined environments.

Micro-cells would not serve as a feasible alternative for the coverage objective for many of the same reasons as an Outdoor DAS system.

22. Who conducted the feasibility studies on alternate technologies?

A22 T-Mobile respectfully interposes the objection and response to Interrogatory 21, above.

23. Please provide the feasibility studies or data by which you determined the lack of feasibility?

A23 T-Mobile respectfully interposes the objection and response to Interrogatory 21, above. Notwithstanding this objection, T-Mobile provides the following additional response: Not applicable.

24. Have you employed in Connecticut stealth technology including flush mounting, internal mounts, combined antenna arrays (single antennas which will serve LTE, PCS and 850Mhz), and close centerline to centerline antennas (close meaning < 8ft)? If so, which of these technologies and where?

A24 T-Mobile objects to this Interrogatory because it is unlimited in scope – the existing facilities nationwide that employ such technologies are too numerous to list. Additionally, T-Mobile notes that the Facility would employ stealth technology. T-Mobile has utilized stealth technology on several occasions in Connecticut. T-Mobile has utilized stealth technology in Connecticut. Some examples include flag poles (Milford) and flush mounted antennas (Old Lyme, Branford and Stratford). T-Mobile has employed close centerline configurations most recently outside of Connecticut.

25. Is there a particular standard or decibel signal strength which you believe is necessary for adequate coverage for PCS (1900MHz) service in the target coverage area? For 850MHz service? For 700 MHz

A25 This response is directed to T-Mobile's service in the Trumbull area. T-Mobile has established -84 dBm as its minimum design threshold for in-vehicle use and -76dBm for in-building use. Of the three frequency bands listed, T-Mobile is currently utilizing only the 1900 MHz PCS band in the state of Connecticut.

26. What particular dBm signal strength do you believe is necessary for in-vehicle coverage for PCS (1900MHz), 700 MHz and 850MHz in the target area?

A26 T-Mobile's minimum design threshold for in-vehicle coverage is -84dBm. Of the three frequency bands listed, T-Mobile is currently utilizing only the 1900 MHz PCS band in the State of Connecticut.

27. In the proposed coverage maps submitted by the Applicant, what loss margin was assumed in the modeling?

A27 T-Mobile objects to this interrogatory because it is unclear and vague. Notwithstanding this objection, T-Mobile provides the following response: The propagation maps provided by T-Mobile are based upon providing 95 percent reliable signal over the coverage objective.

28. How many residences (as opposed to acres) will have year round views of the proposed towers? Seasonal views?

A28 Please see Application, Exhibit M.

29. What is the lowest height you can construct a tower to improve coverage (with and without co-located carriers)?

A29 Please see T-Mobile's response to Interrogatory 8, above. See also T-Mobile's responses, dated October 25, 2011, to the First Set of Interrogatories propounded by the Connecticut Siting Council; T-Mobile's Application; and the Pre-filed Testimony of Scott Heffernan. Additionally, T-Mobile seeks to provide new coverage, as well as improving coverage, with the proposed Facility.

30. Can you provide separate proposed and existing coverage maps depicting the coverage from the target levels up to -88dBm with the levels at -3dBm intervals (e.g.: - 74 to -77dBm, -77dBm to -80dBm, etc)?

A30 T-Mobile has already provided propagation plots depicting the existing and proposed coverage of the coverage objective. See Application, Exhibit H.

31. Please identify how many other future sites will be necessary, at a minimum to accomplish adequate coverage in Trumbull.

A31 T-Mobile cannot foreclose the possibility of exploring additional sites in the future as the need arises.

32. Please identify any sites in addition to the Proposed Facility at which you intend to seek permission from the Siting Council to construct or modify a facility in the Trumbull area (Trumbull and adjacent towns)?

A32 T-Mobile is not considering any other sites for development at this time.

33. Despite the pre-emption of local zoning by the CSC, will construction practices for the proposed facility conform to local building and zoning ordinances and regulations?

A33 T-Mobile would build the proposed Facility in accordance with the law applicable to telecommunications facilities.

34. Can you provide coverage propagation maps and isolated propagation maps for the proposed facility on clear plastic overlays using a scale that matches that of the Application?

A34 T-Mobile declines to produce an additional and enhanced set of propagation plots with clear plastic overlays. T-Mobile has already produced propagation plots with its Application.

35. What is the minimum dBm signal strength to accomplish hand off of a call to an adjacent cell for 700Mhz, 850 MHz and 1900 Mhz?

A35 T-Mobile's minimum design threshold is -84 dBm. At signal levels below this value, a successful handover depends on the quality of the signal; however, the quality of the signal below this value decays more quickly due to external interfering sources – including network wide frequency reuse patterns. Finally, of the three frequency bands listed, T-Mobile is currently only utilizing the 1900 MHz PCS band in the State of Connecticut.

36. What are the coordinates, antenna heights, antenna types, orientations, tilt, EIRP for all of your existing wireless facilities in Trumbull and adjacent towns which are directed into Trumbull?

A36 Please see table of parameters listed in this Interrogatory related to the proposed Facility and each adjacent telecommunications facility appended hereto as Attachment A.

37. What information, data, studies or other evidence was provided to you by the Town of Trumbull justifying the height of the tower for their emergency communications needs? If any studies exist (e.g.: coverage maps), please provide a copy.

A37 The Town's consultant, Northeastern Communications, has stated consistently that the Town would need a height of 150 AGL to provide adequate coverage for the Town's emergency communication needs and to support future technologies.

38. The original proposal by T-Mobile was for a 130ft monopole, what caused the height increase to 150ft?

A38 T-Mobile objects to the purported facts or characterization of purported facts presented by the interrogatory. T-Mobile has consistently proposed a 150 foot telecommunications facility that would enable T-Mobile to locate its antennas at approximately 140 feet AGL. The additional footage would be necessary to situate the Town's equipment atop the proposed Facility without causing any interference with T-Mobile's equipment.

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Respectfully submitted,

T-MOBILE NORTHEAST LLC

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CERTIFICATE OF SERVICE

I hereby certify that on this day a copy of the foregoing was delivered by Electronic Mail and First Class U.S. Mail, postage prepaid, to all parties and interveners of record, as follows:

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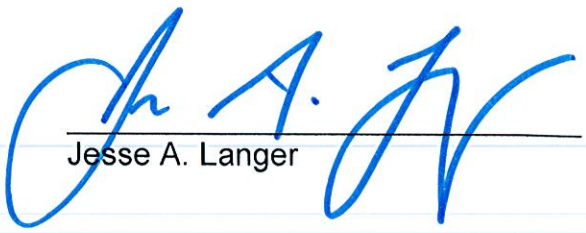

Jesse A. Langer

ATTACHMENT A

SITEID	LATITUDE	LONGITUDE	CELL	ORIENTATION	GE (ft)	RC (ft)	BEAM_WIDTH Degrees	Electrical Down Tilt	Mechanical Down Tilt	ERP	ANTTYPE	Status
CT11836A	41.2621	-73.251	CT11836A	0	587	44	83	2	0	59	APXV18_209014_02	On Air
CT11836A	41.2621	-73.251	CT11836B	120	587	44	83	2	0	58	APXV18_209014_02	On Air
CT11836A	41.2621	-73.251	CT11836C	240	587	44	83	2	0	59	APXV18_209014_02	On Air
CT11679A	41.2304	-73.2266	CT11679A	60	256	77	70	2	0	58	RR65_18_02DP	On Air
CT11679A	41.2304	-73.2266	CT11679B	190	256	77	67	4	0	57	FR651704_P	On Air
CT11679A	41.2304	-73.2266	CT11679C	300	256	77	70	2	0	58	RR65_18_02DP	On Air
CT11424B	41.2228	-73.2225	CT11424A	90	243	95	63	4	0	61	APX16DWV_16DWVS_04	On Air
CT11424B	41.2228	-73.2225	CT11424B	210	243	95	62	2	0	58	APX16DWV_16DWVS_02	On Air
CT11424B	41.2228	-73.2225	CT11424C	330	243	95	62	2	0	58	APX16DWV_16DWVS_02	On Air
CT11080B	41.2316	-73.19	CT11080A	30	164	157	90	2	0	59	RR90_17_02DP	On Air
CT11080B	41.2316	-73.19	CT11080B	150	164	157	92	4	0	56	RR90_17_04DP	On Air
CT11080B	41.2316	-73.19	CT11080C	270	164	157	90	2	0	56	RR90_17_02DP	On Air
CT11871C	41.2135	-73.2119	CT11871A	0	171	57	67	4	0	58	TR651804_PL2Q	On Air
CT11871C	41.2135	-73.2119	CT11871B	120	171	57	67	4	0	58	TR651804_PL2Q	On Air
CT11871C	41.2135	-73.2119	CT11871C	240	171	57	67	4	0	58	TR651804_PL2Q	On Air
CT11680A	41.2196	-73.2012	CT11680A	0	194	202	65	4	0	57	APX16PV_16PVL_T4	On Air
CT11680A	41.2196	-73.2012	CT11680B	110	194	202	65	6	0	57	APX16PV_16PVL_T6	On Air
CT11680A	41.2196	-73.2012	CT11680C	240	194	202	65	6	0	57	APX16PV_16PVL_T6	On Air
CTFF481B	41.2344	-73.2189	CTFF481A	60	321	140	65	2	0	58	APX16DWV_16DWVS_02	Proposed
CTFF481B	41.2344	-73.2189	CTFF481B	150	321	140	65	2	0	58	APX16DWV_16DWVS_02	Proposed
CTFF481B	41.2344	-73.2189	CTFF481C	340	321	140	65	2	0	58	APX16DWV_16DWVS_02	Proposed