



# ANALYSIS OF THE T-MOBILE PCS PLAN FOR THE NEW JERSEY PINELANDS

Prepared for  
**The Pinelands Commission**  
PO Box 359  
New Lisbon, NJ 08064



Prepared by  
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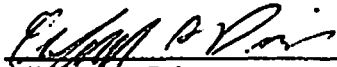
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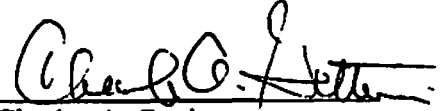
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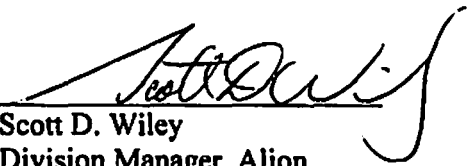
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## BACKGROUND

The Pinelands Commission, the state agency responsible for protecting, preserving and enhancing the natural and cultural resources of the Pinelands Area, has requested Alion Science and Technology to assist the Pinelands Commission staff in its review of a T-Mobile PCS amendment submission<sup>1</sup> to an existing Telecommunications Plan, which consists of both Cellular and PCS components, for the New Jersey Pinelands. The proposed Amendment indicates a need for 36 additional cells, including new towers, throughout the New Jersey Pinelands. The proposed Amendment relates directly to regulations (N.J.A.C. 7:50-5.4) in the New Jersey Pinelands Comprehensive Management Plan (CMP).

The Pinelands Commission is a regional land use agency with jurisdiction over all or portions of seven counties and 53 municipalities in southern New Jersey. Since 1981, when the CMP went into effect, the construction of tall structures has been discouraged throughout much of the New Jersey Pinelands (hereinafter Pinelands). These regulatory limitations, which incorporated a 35-foot height limit in N.J.A.C. 7:50-5.4, were intended to prevent the littering of the Pinelands skyline with structures that significantly detract from the scenic qualities which federal and state Pinelands legislation called upon the Pinelands Commission to protect. There were, of course, exceptions to this requirement: certain structures were allowed to exceed 35 feet in height; and no restrictions were placed on height within the two most development-oriented Pinelands management areas – Regional Growth Areas and Pinelands Towns (a map identifying the various Pineland management areas is located at <http://www.nj.gov/pinelands/landuse/gis/maps/>).

To accommodate what it saw as a legitimate need, in 1995, the Pinelands Commission amended N.J.A.C. 7:50-5.4 to permit telecommunications facilities to exceed the 35-foot height limit. However, while the Commission desired to help facilitate coverage needs in the Pinelands, it was also essential to keep the number of towers, and their visual and ecological impacts, to an absolute minimum. As such, the Commission required that a comprehensive plan for the entire Pinelands must be first prepared and approved by the Commission before a facility exceeding 35 feet in height could be permitted in the conservation-oriented (“height restricted”) areas of the Pinelands.

The new regulations recognized that: local communications systems rely on a network of facilities to receive and transmit radio signals; the location of each cell within this network has an effect on the location of other cells; and a well- designed and integrated network can avoid proliferation of unnecessary towers throughout the Pinelands and most importantly, in its most conservation-oriented (“height restricted”) and visually sensitive (“height restricted”) areas. Following Plan approval, the

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<sup>1</sup> Warren Stilwell, *Amendment to the Comprehensive Plan for PCS Communications Facilities in the Pinelands on behalf of T-Mobile Northeast LLC, Doing Business as T-Mobile*, August 1, 2011, Cooper Levenson Law Offices, Atlantic City, NJ 08401

regulations anticipate that specific sighting decisions will be made such that visual impact will be minimized, and that individual development applications will be submitted and evaluated against a series of site specific development standards. When a new need is demonstrated, a provision exists for amendments to an approved plan. It is under this provision that the Commission seeks to evaluate the T-Mobile/Sprint proposed Amendment.

The Commission requested Alion support in determining whether the new towers proposed within the height-restricted areas of the Pinelands are needed from an R/F coverage standpoint. In making this determination, the Alion shall consider co-location at sites identified in the approved Plan, whether any proposed sites can be combined without losing adequate coverage, and whether any proposed facilities can be replaced outside of a height-restricted area.

## **ANALYSIS**

Alion conducted a review of the available technical materials including the site plan and the applicable zoning regulations.

Technical issues that were reviewed included current service coverage and service criteria, the consideration of any existing structures, towers, and commercial buildings, the site selection process, and justification for the proposed antenna location.

The Amendment contains a series of coverage plots that are intended to show the necessity for the proposed tower locations. Alion used their proprietary RF Analyst Toolbar and the Okumura-Hata model to verify T-Mobile's coverage results. The RF Analyst Toolbar uses ESRI ArcGIS and advanced urban and terrain-dependent propagation path loss models to determine system coverage and performance and simulate the propagation of radio-frequency (RF) energy in the environment. At the heart of this tool is engineering software that computes the effect of terrain and other environmental factors on the propagation of RF energy. Built-in antenna performance data combined with Geographic Information Systems (GIS) data shows the performance of radio frequency signals as affected by topography and man-made structures. The Okumura-Hata model is a well known, industry accepted model used to predict signal losses of cellular transmissions. Lacking actual data from T-Mobile, Alion assumed system characteristics (i.e., transmitter powers, gains, and antenna heights) based on frequency assignment data from the FCC database. Based on its analysis using the Okumura-Hata model and RF Analyst Toolbar, Alion finds the coverage plots presented by T-Mobile to be reasonable.

Based upon review of the proposed tower locations and the coverage plots, it is clear that the proposed sites cannot be combined without negatively affecting coverage. A similar review determined that it is not feasible to relocate the proposed sites outside of the height-restricted areas without negatively affecting coverage. However, the Alion review did raise questions regarding the ability of T-Mobile to co-locate with other wireless providers and/or utilize existing structures for its proposed sites. Specific comments regarding co-location and the use of existing structures are listed below by site. A complete list of the proposed sites along with any comments/observations is presented in Appendix A.

- PCS Plan Facility 72: The Amendment states the Site will use an existing structure in the form of First Energy Electric Transmission Tower. The closest tower found in Google Earth or ArcGIS is 900 meters away from the proposed location. T-Mobile should be alerted of this discrepancy in case it affects their choice of location.
- PCS Plan Facility 82: This site is in a Regional Growth Area. However, it appears there is an existing tower 400 meters away at latitude 39.7398 N and longitude 74.2807W. T-Mobile should review the plan for Facility 82
- PCS Plan Facility 83: ArcGIS files indicate there is a fire tower at latitude 39.9213N and longitude 74.2586W. The tower is not visible in Google Earth. If they have not done so already, T-Mobile should review the plan for Facility 83.
- PCS Plan Facility 85: This site is in a Regional Growth Area. T-Mobile states a new structure is required, but there appears to be a water tank 900 meters away at latitude 39.9394N and longitude 74.2155W and a power line tower 130 meters away. T-Mobile should review the plan for Facility 85.
- PCS Plan Facility 86: T-Mobile states a new structure is required, but there appears to be an existing tower 500 meters away at latitude 39.7508N and longitude 74.3700W. If they have not done so already, T-Mobile should review the plan for Facility 86.
- PCS Plan Facility 92: T-Mobile states a new structure is required, but AT&T site 323 appears to be 1 km away at latitude 39.4791N and longitude 74.5758W. There also appears to be a cell plan Site 586 in the area although not visible with Google Earth. If they have not done so already, T-Mobile should review the plan for Facility 92.
- PCS Plan Facility 107: T-Mobile states that the planned facility is near a possible extraction site. However, Google Earth images do not support this assertion.
- PCS Plan Facility 111: T-Mobile states a new structure is required, but there appears to be a power line tower 200 meters away. If they have not done so already, T-Mobile should review the plan for Facility 111.

## CONCLUSION

In summary, the T-Mobile Amended Plan constitutes an accurate representation of the existing and proposed communication facilities necessary to provide adequate, reliable wireless service to the New Jersey Pinelands region now and for the near future. Based upon review of the proposed tower locations and the coverage plots, it is clear that the proposed sites cannot be combined without negatively affecting coverage. A similar review determined that it is not feasible to relocate the proposed sites outside of the height-restricted areas without negatively affecting coverage. However, the Alion review did raise questions regarding co-location with other wireless providers and/or utilization of existing structures for the proposed sites.

## APPENDIX A

New #	Site # (per last revision)	Notes
69	OCE002	Concur that this site is located in the vicinity of a resource extraction area.
70	OCE003	Concur that this appears to be a substantially developed area.
71	OCE006	Concur that the site appears to be in the area of a cement making site as well as a Municipal Utility Authority well.
72	OCE012	T-Mobile states the Site will use an existing structure in the form of First Energy Electric Transmission Tower. The closest tower found in Google Earth or ArcGIS is 900 meters away from the proposed location. T-Mobile should be alerted of this discrepancy in case it affects their review the plan for Facility 72.
73	ATT357	Using previously approved site
74	OCE017	Using existing structure
75	OCE019	Site in Regional Growth Area
76	OCE025	Using existing structure
77	OCE027	Concur with T-Mobile assessment that there are no existing structures/sites in the general area, that the area is a Preservation Area, and that certification of a comprehensive plan is required.
80	ATT358	Using previously approved site
81	OCE032	The site appears to be in the area of an existing junkyard.
82	OCE035	Site in Regional Growth Area. Note, it appears there is an existing tower 400 meters away at latitude 39.7398N and longitude 74.2807W.
83	OCE040	Concur with T-Mobile assessment that there are no approved sites in the general area and that the area is a Forest Area. ArcGIS files indicate there is a fire tower at latitude 39.9213N and longitude 74.2586W. The tower is not visible in Google Earth. If they have not done so already, T-Mobile should review the plan for Facility 83.
85	OCE059	Site in Regional Growth Area. T-Mobile states a new structure is required. However, there appears to be a water tank 900 meters away at latitude 39.9394N and longitude 74.2155W and a power line tower 130 meters away. If they have not done so already, T-Mobile should review the plan for Facility 85.
86	OCE065	Site is near existing fire department. T-Mobile states a new structure is required but there appears to be an existing tower 500 meters away at latitude 39.7508N and longitude 74.3700W. If they have not done so already, T-Mobile should review the plan for Facility 86.
88	OCE067	Concur with T-Mobile assessment that there are no existing structures/sites in the general area, that the area is a Preservation Area, and that certification of a comprehensive plan is required.
90	1BL5827D	Concur with T-Mobile assessment that there are no existing

		structures/sites in the general area, that the area is a Forest Area, and that certification of a comprehensive plan is required.
91	1AT6619G	Site is near existing New Jersey State Facility.
92	1AT6447C	T-Mobile states a new structure is required but AT&T Site 323 appears to be 1 km away at latitude 39.4791N and longitude-74.5758W. There also appears to be a cell plan Site 586 in the area although not visible with Google Earth. If they have not done so already, T-Mobile should review the plan for Facility 92.
93	1BL6450C	Site in Regional Growth Area
94	1CU6614A	Concur with the T-Mobile statement that a new structure is required and the site is proposed to be located in a certified commercial area with mixed uses and therefore, it meets Section 6 requirements.
95	1CU6776A	Using existing structure.
96	1CM6777D	Concur with the T-Mobile statement that a new structure is required. Also concur that the T-Mobile Amendment proposes to use the least number of towers to achieve required coverage, as required by N.J.A.C. 7:50-5.4 c vi. 6.
97	1AT6782C	Concur with T-Mobile assessment that there are no existing structures/approved sites in the general area, that the area is a Forest Area, and that certification of a comprehensive plan is required. Also note that there is a mixed use commercial area within one mile of the proposed location
98	1BL7640	Concur with T-Mobile assessment that there are no existing structures/approved sites in the general area and that the area is a Preservation Area. Certification of a comprehensive plan is required. Also note, there is junk yard within 1 km of the proposed location.
99	1AT6798D	Using existing structure.
100	1AT6795D	Site in Regional Growth Area
101	1AT6828C	Site in Regional Growth Area
103	1AT6789A	Site in Regional Growth Area
104	1BL6234D	Using existing structure.
105	1GL6623F	This site is in a Rural Development Area.
107	1CM6839U	T-Mobile states that the planned facility is near a possible extraction site. However, Google Earth images do not support this assertion.
108	1BL6917E	Using existing structure.
109	1BL7311	Site in Regional Growth Area
110	1BL7312	This site is in an Agricultural Production Area.
111	1CA7298B	T-Mobile states a new structure is required but there appears to be a power line tower 200 meters away. If they have not done so already, T-Mobile should review the plan for Facility 111.