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July 7, 2021

Maine Land Use Planning Commission
c/o Karen E. Bolstridge, Environmental Specialist III
Maine Dept. of Agriculture, Conservation & Forestry
106 Hogan Road, Suite 8
Bangor, ME 04401

Subject: Responses to Staff Comments and Questions on Telecommunications Needs Analysis and Visual Impact Assessment for DP 5050-B

Dear Karen:

On behalf of Rising Tide Towers, Black Diamond Consultants is providing the following responses to the LUPC staff comments and questions regarding our telecommunications needs analysis and visual impact assessment (VIA), which were included as a memorandum attached to the 4/14/2021 LUPC Data Request (referenced here as the "staff memo").

Telecommunication Needs Analysis

The staff memo notes that our telecommunications needs analysis "assumes that the best solution to address the gap in FirstNet coverage in Dallas Plantation is to build one tall tower" and asks us to evaluate the possibility of locating multiple shorter towers to achieve the goals of the project. It appears that the staff concern underlying this request is with regard to the visual impacts of the required FAA lights on the proposed tower. That issue is addressed below as part of the applicant's expanded visual impact analysis.

We also note that, when considering visual impacts, a clustered siting of telecommunications towers would likely have a greater visual impact on the visual character of the area. This is because a cluster of towers would be a more dominant feature in the landscape. This is one reason that co-location is generally encouraged by municipalities and other permitting entities for telecommunications facilities. The cumulative visual effect of multiple towers is generally considered by residents and recreational users to be greater than the impact of a single facility, as the cluster is more apparent in the landscape at all distances.

Additionally, in our telecommunications needs analysis, we assessed the feasibility of locating a tower—of *any* height, with or without lighting—on other parcels within the FirstNet/AT&T search ring (i.e., the area identified by FirstNet/AT&T where a wireless telecommunications tower must be located to achieve the necessary rf coverage and required connection to support the FirstNet network). Except for the selected parcel where the tower is proposed to be sited, all other properties within the search ring are not available for installation of a telecommunications tower—*regardless of the height of the tower*—because (1) the LUPC decision to deny Rising Tide Towers' original application effectively foreclosed our ability to construct a tower (with or without FAA lighting) anywhere in the Community Residential Development (D-RS2) subdistrict, and (2) outside the D-RS2 subdistrict, title issues, lack of viable road access,

significant environmental constraints (e.g., expansive wetlands), and/or unwillingness of landowners to lease land for the project prevent us from siting a tower elsewhere. These constraints on constructing a tower in the search ring equally constrain our ability to construct multiple, shorter towers in the search ring.

In sum, there is no other parcel available and feasible for one tower, let alone multiple towers, in the search ring.

Visual Impact Assessment

Existing Levels of Use and Traffic Patterns

The staff memo asks for information regarding the use and traffic patterns on affected segments of the Rangeley Lakes National Scenic Byway, Rangeley Lake State Park, Haley Pond Municipal Park, as well as Haley Pond, Gull Pond, Loon Lake, and Saddleback Lake.

Prior to completing the VIA, our consultant Julie Larry reviewed state and local planning documents, researched recreational websites on trails and other activities and sites in the APE. In Rangeley, she spoke with the local tourist center and Chamber of Commerce employees, area residents, and visitors who frequent the area for various activities (work, fly-fishing, camping, etc.). The following paragraphs provide additional information about Ms. Larry's methodology and how user data was applied in the VIA:

- The Rangeley Lakes National Scenic Byway follows State Routes 4, 16 and 17, all major arterial roads. The assumption in the VIA is that these are well traveled roads, although it was observed in the field that some areas are more heavily traveled, particularly in or near Oquossuc and Rangeley Villages due to additional local traffic. The findings of the VIA would not change if the usage was higher or lower. What we did take into account was the public expectation of the quality of the view along the byway. The area along the byway where views of the proposed tower were visible are the more developed sections of the byway, in Rangeley Village and just west of Rangeley Village. In these areas, there is a pattern of rural development and there are public services (gas stations, hotels, banks, etc.); therefore, the public expectation of high scenic quality would be lower than in areas where there is no such development pattern.

- Rangeley Lake State Park has many users and uses, camping, boating, swimming, hiking, fishing. The assumption about level of use in the VIA is that areas of the Park operate at capacity while the Park is open to the public. The findings and conclusions in the VIA would not change if the usage was higher or lower.

- Haley Pond Municipal Park is a very small park. It is a moderately busy park, as it is just off Main Street and close to area cafés in Rangeley. Uses are usually short term—launching a kayak, eating a sandwich, etc. There are two benches, a gazebo, and a small boat landing for launching kayaks or canoes. There is ice skating in winter from the park with a warming hut and lights for night skating. The findings and conclusions in the VIA would not change if the usage was higher or lower.

- Haley Pond, Gull Pond, Loon Lake, and Saddleback Lake all have some development along the shoreline. Boating (non-motorized and motorized watercraft) are present on these lakes. Motorized boats were observed at private docks along the shorelines of each waterbody. The findings of the VIA would not change if the usage was higher or lower. What we did take into account was the public expectation of the quality of the view on those water bodies. A user in a non-motorized watercraft would have a longer duration of a view and be expecting a different visual and auditory experience than a user in a motorized watercraft, for example. Accordingly, on Haley Pond, a canoeist on the Northern Forest Canoe Trail was assumed to have a higher expectation of scenic quality than a boater using a motorized watercraft. This is reflected in our findings. Because there will be no views of the tower observed from Gull Pond, Loon Lake or Saddleback Lake, the usage on those lakes does not affect the VIA analysis or conclusions.

Methodology Regarding Resource Ratings in VIA

Regarding the VIA methodology and the staff's question as to why certain resources were rated "moderate" in the VIA:

> As discussed above, use data affects the scenic value rating that we applied to a given resource because it informs the public's expectation of the quality of the view from that resource. Accordingly, a moderate rating was applied to a resource like Rangeley Lake State Park because, while it has a high scenic value (*see* TJD&A analysis cross-referenced below), it also has recreational value and the public's expectation of the view from that resource is affected by the presence of other users and other development within the public view.
>
> In the case of Rangeley Lake, the views of the proposed tower from the lake have other development within the view shed, and there is development along the shore and on the hillside up to the tower. For this reason, the VIA rated the Northern Forest Canoe Trail as having high significance, but the waterbodies it traverses (e.g., Rangeley Lake) was rated as having moderate significance. This difference reflects the expectation of the user. A user of the Northern Forest Canoe Trail is more specific than a user of Rangeley Lake, who may be participating in one or more varied activities like picnicking, boating, water skiing, swimming, hiking, or fishing. Thus, a Northern Forest Canoe Trail user whether on Rangeley Lake or along the Route 16 portage likely has a higher expectation of the area's scenic quality than someone participating in one of the various other activities on Rangeley Lake (motor boating, for example).
>
> A rating of 'moderate' in the VIA therefore simply means that a scenic resource may have a high scenic value, but is also known or appreciated by the public for other reasons like its historic or recreational significance and is located in a setting where the public view includes existing development and other users. Thus, while the scenic qualities of Rangeley Lake and Rangeley Lake State Park are considered high, the presence of existing development, a communications tower with FAA lighting, etc. mitigates the visual impacts of the proposal.

Additional Questions and Requests Related to the VIA

Rising Tide Towers retained Terrence J. DeWan & Associates (TJD&A) to provide responses to the LUPC staff's remaining questions concerning the VIA. Those responses, including a comprehensive visual impact analysis of the FAA-required lighting on the proposed tower, can be downloaded here:

https://spatialalt.sharefile.com/share/view/sd514d79a396b4cf2a6b30962f116e83c/fo0d955b-2824-4c60-b92d-e37b77684bbb

Summary and Conclusion

Taking into account this supplemental information, our findings and conclusions regarding the visual impacts of the proposed telecommunications tower on existing scenic resources can be summarized as follows:

1. Neither the lattice tower nor the FAA-required lighting will be visible from Saddleback Lake or Loon Lake.

2. Neither the lattice tower nor the FAA-required lighting will be visible from campsites within Rangeley Lake State Park.

3. In those places where there are likely to be views of the lattice tower, the views will be limited and intermittent, partial and distant, with no diminishing of the integrity of existing viewscapes.

4. While the FAA-required lighting will likely be visible from the Rangeley Lake State Park beach and boat launch, Rangeley Lake, Haley Pond, segments of the scenic overlook, and portions of the AT, any impacts of the lighting will be mitigated by:

    - Existing lighting existing streetlights, vehicle headlights, and/or building lights associated with Rangeley Village;

    - Existing lighting from telecommunications towers with FAA-required lighting (located on the north side of Rangeley Lake on Route 4, and on the Loon Lake Road north of Rangeley); and

    - The minimal or nonexistent public use of high-value scenic resources at night.

For these reasons, the proposed tower will cause no undue adverse effect on any existing uses, scenic character, and natural and historical resources in the area.

We trust this letter is responsive to LUPC staff's additional comments and questions. We ask that you process our application and schedule a public hearing at the earliest possible time.

Respectfully submitted,

James A Hebert

Jim Hebert / Black Diamond Consultants, Inc.

tjd&a | Landscape Architects & Planners

July 2, 2021

TO: Megan McGuire / Black Diamond Consultants

FR: Terry DeWan / TJD&A Landscape Architects & Planners

RE: Responses to LUPC Comments on development application for Dallas Plantation Telecommunications Facility

Megan,

Below are responses to the comments from LUPC you asked TJD&A to develop. In addition to these written responses, we have provided the following graphic attachments:

- Attachment A: Viewshed Analysis
- Attachment B: Visual Simulations
- Attachment C: Photo Collection
- Attachment D: Video Clips

Please let us know if you need us to make revisions to any of the material. If you would prefer these responses to be in a different format or provided as separate reports, please let us know.

2. Clarify the basis for rating the level of significance for Rangeley Lake and Rangeley Lake State Park (see comment 3,a,i-ii).

RANGELEY LAKE

While LUPC standards do not offer a clear method to determine what constitutes a high, medium, or low level of significance, there is a body of Maine-based work that can be used to inform the decision regarding significance. It is important to note that by 'significance' we are evaluating only the scenic quality of a particular scenic resource. "Scenic Resources are those landscape patterns and features which are visually or aesthetically pleasing and which positively contribute to the definition of a distinct community or region. Resources such as lakes, rivers and streams, mountains, coastal islands and forestlands, including working forests, are some of the most notable attributes of the jurisdiction and make it a place of outstanding scenic value."[1]

Maine Wildlands Lake Assessment

The *Maine Wildlands Lake Assessment* was initiated in 1986 to establish a systematic base of natural resource and land use information on all lakes within the Land Use Planning Commission's jurisdiction. The *Assessment* considered all lakes with a surface area of ten acres or more; 1,509 lakes met this size requirement. Based on methods developed in the *Maine Wildlands Lake Assessment Work Plan*, information was collected on the following natural resources for each of the waterbodies:

- Fisheries
- Scenic quality
- Botanical features
- Physical resource
- Wildlife
- Shoreline character
- Cultural resources

Lakes that possessed "significant" or "outstanding" resource values in any of these areas were identified through a process of office and field evaluation. Each lake was then placed into one of the following four Resource Classes based on its cumulative resource significance:

- Lakes of statewide significance with **multiple outstanding natural values**, are categorized as Resource Class 1A (114 lakes).
- Lakes of statewide significance with a **single outstanding natural value**, are categorized as Resource Class 1B (211 lakes).
- Lakes of regional significance (**one or more significant ratings**), are categorized as Resource Class 2 (577 lakes).

[1] Maine Land Use Regulation Commission. *2010 Comprehensive Land Use Plan*. 2010.

- Lakes of local or unknown significance, are categorized as Resource Class 3 (627 lakes). [2]

Rangeley Lake received a rating of 'outstanding' for its fisheries, scenic quality, cultural resources, and physical resources, and a rating 'significant' for its wildlife, shoreline character, and botanical features. Based upon these ratings, Rangeley Lake was assigned to Resource Class 1A (Lakes of statewide significance with multiple outstanding natural values).

Scenic Lakes Character Evaluation in Maine's Unorganized Towns

Prior to the publication of the Assessment, the State Planning Office issued the *Scenic Lakes Character Evaluation in Maine's Unorganized Town*s, which evaluated the scenic characteristics of all 1,509 lakes and ponds (with a surface area greater than 10 acres) in the Unorganized Territories (UT). The *Evaluation* was based on six criteria: relief, physical features, shoreline configuration, vegetation diversity, special features, and inharmonious development. A point system was developed to assign a rating to each of the criteria, depending upon their presence (or absence) in the landscape.

The range of points in the *Evaluation* was 0 to 100. Visual inspection of the data revealed the results grouped into three clusters: lakes with 50 or more points were identified as 'outstanding'; lakes with 20 to 45 points were considered 'significant'; and lakes with less than 20 points were rated as 'scenic.' A total of 118 lakes (8% of the total, including Rangeley Lake), were identified as 'Outstanding' in the *Evaluation*; 162 lakes (11% of the total) were identified as 'distinctive', which was the basis for the 'Significant' category.

As part of the *Evaluation*, the data points were distributed to professionals in the Department of Conservation, the MaineDEP, and the Bureau of Parks and Recreation for review and overall accuracy of the results. According to the authors of the *Evaluation*, there was strong support for the overall rating scheme and agreement with individual ratings.

Table 1. Visual Characteristics of Rangeley Lake provides a short description of each of the six criteria, the maximum number of points that could be assigned, and the ratings for Rangeley Lake.[3] For the final criteria of inharmonious development, twenty points (the maximum) could be deducted from the total score if the reviewers found drastic fluctuations in water levels. Other types of inharmonious development were given negative points based on the visual dominance of the visible development. In the case of Rangeley Lake, 10 points were deducted from the total score for the inharmonious development observed 35 years ago when the *Evaluation* was performed. There has been no attempt to update the *Evaluation* or the *Maine Wildlands Lake Assessment* since they were published.

[2] Maine Land Use Regulation Commission. *2010 Comprehensive Land Use Plan*. Appendix C – Lake Management Program. 2010.

[3] Maine State Planning Office. *Scenic Lakes Character Evaluation in Maine's Unorganized Towns*. December 1986. The ratings in the chart – from None to High – are taken from the SPO document.

With 55 points, Rangeley Lake is considered a waterbody with outstanding scenic characteristics.

TABLE 1. VISUAL CHARACTERISTICS OF RANGELEY LAKE				
FACTOR	**DEFINITION**	**RATING**	**MAX. PTS.**	**SCORE**
Relief	Complexity of relief, dramatic relief	Medium	30	20
Physical Features	Cliffs, vertical ledges, slab ledges, rockslides, boulders, islands, beaches.	High	25	25
Shoreline Configuration	Relative complexity of the shoreline.	Low	15	5
Vegetation Diversity	Four possible types were identified: mixed hardwood/softwoods; softwoods; marsh; super-story trees.	Low	15	5
Special Features	Water clarity Opportunities for wildlife viewing	Medium	15	10
Inharmonious Development	Residential development, visible roads, powerlines, etc.	High	-20	-10
			TOTAL	**55**

LUPC Comprehensive Land Use Plan

LUPC's 2010 *Comprehensive Land Use Plan (CLUP)* includes Rangeley Lake in Management Class 7. The Commission's management objectives for waterbodies in Class 7 is to manage these lakes for multiple uses, including resource conservation, recreation, and timber production. The land use plan considered identified resource values when evaluating the merits of lake-related rezoning.

Rangeley Lake is considered part of the Western Mountains Data Region in the *CLUP*. This is an area "known for its outstanding natural resources, including a variety of exceptional lakes, rivers and mountains. The area has numerous large lakes, including Rangeley, Mooselookmeguntic, Richardson, and Aziscohos. It also has most of Maine's highest mountains, including Bigelow, Saddleback, Sugarloaf, Kibby and Redington, many of which are traversed by the Appalachian Trail. The combination of outstanding natural resource values makes the Western Mountains area a historically popular recreation destination."[4]

Rangeley Prospective Zoning

Prospective Zoning is a relatively new approach to guide growth in certain areas within the LUPC jurisdiction. In the late 1990's the Commission undertook prospective zoning for the ten minor civil divisions (MCDs) in the Rangeley Lakes region and issued the *Prospective Zoning Plan for the Rangeley Lakes Region*. While the *Plan* does not evaluate the scenic quality of individual lakes in the region, it does recognize their overall quality. As part of the Regional Vision for the

[4] Maine Land Use Regulation Commission. *2010 Comprehensive Land Use Plan*. 2010.

area – in a section entitled 'High Quality Lakes' – the *Plan* envisions "Generations from now, the Rangeley Lakes Region will still have high quality lakes offering an array of experiential settings."

The Proposed Management Character of Rangeley Lake is envisioned to be "Developed – Near Regional Center. Heavily developed lake setting with a combination of seasonal and year-round development in shoreland and some backland. Evidences of the sights and sounds of shoreland development are high. Backland development has substantial shoreland access." [5]

Wind Energy Act

While the Dallas cell tower proposal is much different than a commercial wind energy facility, the permitting requirements for both have some similarities in the requirement for a visual impact assessment. As part of the application to the State (DEP / LUPC) filed under the Maine Wind Energy Act, applicants are required under Chapter 382 to evaluate the significance of potentially affected scenic resources of state or national significance (SRSNS). Applicants must determine if the scenic resource is high, medium, or low value, based upon considerations of evidence in the record regarding its significance.

> **B. Significance of a potentially affected SRSNS.** When evaluating whether a proposed development would significantly compromise views from a SRSNS such that the development would have an unreasonable adverse effect on scenic character or existing uses related to scenic character of an SRSNS, the Department will take into consideration all relevant evidence in the record regarding the significance of the SRSNS. In this assessment, the Department will be guided by considerations including but not limited to the following.
>
> (1) Any assessment of the scenic character of the SRSNS through a formal assessment process such as the Maine's Finest Lakes Study, the Maine Wildland Lakes Assessment, a Coastal Scenic Inventory published by DACF, or other federal, state or local government assessment process.
>
> (3) The character, landscape context, unique features, usage patterns, and other relevant characteristics of the SRSNS.
>
> (4) Evidence of the high scenic value of the viewshed from the SRSNS or of the protection of the viewshed through public ownership, conservation easements or other restrictions put in place for purposes specifically including protection of the scenic values of the area. Such evidence may increase the significance of an SRSNS.

[5] Maine Land Use Regulation Commission. *Prospective Zoning Plan for the Rangeley Lake Region, An Amendment to the Land Use Regulation Commission's Comprehensive Land Use Plan*. Effective January 1, 2001.

(5) Evidence of the degradation of the scenic character of the SRSNS by factors such as incompatible development in the viewshed. Such evidence may decrease the significance of an SRSNS.[6]

As noted above, the *Maine Wildland Lakes Assessment* is a formal assessment process that concluded Rangeley Lake has outstanding scenic resources. While much of the lakeshore has been developed, there is considerable amount of land that has been preserved for conservation, including Rangeley Lakes State Park, Bald Mountain, and over 1,600 acres of land on the lake that has been conserved by Rangeley Lakes Heritage Trust.

TJD&A has followed this guidance in evaluating SRSNSs for several recent wind energy projects. Lakes that were considered as 'outstanding' in the *Maine Wildlands Lake Assessment* or the *Maine's Finest Lakes Study* were rated as 'high' scenic significance, while lakes that were considered as 'significant' in these studies were rated as 'medium' scenic significance.

James Palmer, one of DEP/LUPC's designated peer reviewers, has taken a slightly different approach to determine the difference between lakes of high and medium scenic quality. Looking at the results of both the *Maine Wildlands Lake Assessment* and *the Maine's Finest Lakes Study*, he notes "A total of 100 are possible; it appears that lakes with 50 or more points are identified as Outstanding and lakes with 20 to 45 points are Significant. There are approximately 2,378 lakes 10 acres or larger in the state; 6.1% are an Outstanding and 8.7% are a significant scenic resource. Based on these results, I suggest the following thresholds for significance based on the scenic lakes studies: a rating of 20 to 35 is Low, 40 to 55 is Medium and 60 or higher is High."[7]

Rangeley Lake State Park

The scenic character of Rangeley Lake State Park is largely a function of its position on Rangeley Lake. While the landscape character of the forestland within the state park is characteristic of the Rangeley Lakes region, the views from the park and the views toward the park elevate its scenic significance above the ordinary. As noted in the photosimulations (provided in Attachment B) and context photographs from the state park beach (provided in Attachment C), there is very little visible development within five miles of the viewpoint. What the viewer does see is the profile of western Maine mountains rising over the broad expanse of Rangeley Lake.

Conclusion

TJD&A has performed a number of scenic inventories for state agencies and has authored the Scenic Assessment Handbook for the State Planning Office. Based upon our experience in similar situations in Maine and the considerations noted above, we consider the scenic qualities of both Rangeley Lake and Rangeley Lake State Park to be high.

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[6] Maine Department of Environmental Protection. Chapter 382: Wind Energy Act Standards. April 30, 2018.
[7] Palmer, James F. *Review of the Hancock Wind Project Visual Impact Assessme*nt, Prepared for the Department of Environmental Protection, Augusta, Maine. April 22, 2013.

3. Explain in more detail how topography, distance, and/or vegetation combine to mitigate likely views from the Appalachian Trail (see comment 3,b,i).

Approximately 14 miles of the Appalachian National Scenic Trail (AT) are located within the 8-mile APE. According to the viewshed map, there will be intermittent views of the Project throughout the 1.8± miles of the trail between Saddleback Mountain and The Horn. Views of the tower will be partially screened by intervening topography and vegetation, which results in the coarse dot pattern on the viewshed map (see viewshed analysis in Attachment A). Note: enlarge the viewshed map to examine the extent and pattern of visibility on the AT between Saddleback Mountain and The Horn.

From Saddleback Mountain the tower will be approximately 5.4 miles from the AT, at The Horn the tower will be approximately 6.0 miles away. At these distances, the cell tower will be in the background distance zone, which typically extends beyond 3 to 5 miles from a proposed activity.[8] Objects within the background will typically be recognizable only if they exhibit significant contrast in color, form, line, or texture with the surrounding landscape.

The photosimulations prepared by TJD&A, which are based upon computer models of the proposed cell tower, illustrate that the latticework tower will have minimal contrast with its surroundings when viewed from these distances. For example, in the photosimulation from Rangeley Lake State Park, at a distance of 5.7 miles, the tower is only visible by enlarging the image, which is seen against a wooded backdrop.

This observation conforms to accepted professional practice for siting lattice towers in natural-appearing landscapes. The Bureau of Land Management (BLM) Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities provides this guidance for selecting appropriate tower designs:

> Lattice or guyed towers are less visually obtrusive on the rural landscape than monopoles, especially when placed half a mile or more from KOPs (Key Observation Points) and against a landscape backdrop. When transmission towers are placed within a half mile or less from KOPs, then monopoles will occupy a smaller field of view than lattice towers. Monopoles are often more appropriate within built or partially built environments, while lattice or guyed towers tend to be more appropriate for less-developed rural landscapes, where the latticework would be more transparent against natural background textures and colors.[9]

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[8] There are several approaches to classifying Distance Zones in visual impact assessment. The Bureau of Land Management (BLM), for example, considers landscapes 5 to 15 miles from an observer to be in the background. The USDA Forest Service considers 4 miles to be the beginning of the background.

[9] United States Department of the Interior. 2013. *Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands*. Bureau of Land Management. Cheyenne, Wyoming. 342 pp, April.

While topography, vegetation, and distance will certainly interplay to reduce/minimize the view of the tower from the AT, the flashing FAA-required aviation warning lights will be quite visible. The visual impact of this light should consider a number of mitigating factors:

- The lighting will be seen in the context of the street and building lights associated with Rangeley village.
- There are already two communications towers with FAA lighting that should be visible from the AT: one on the north side of Rangeley Lake on Route 4, the second on the Loon Lake Road north of town. Both of these towers are approximately 9 miles from the AT, so their intensity would be somewhat less than the proposed tower, which is 6 miles from the AT (from The Horn).
- There is no camping allowed above treeline on the AT. Due to the unpredictable nature of the weather on the exposed ridgeline, most hikers should be below treeline by sunset when the red tower lights come on. Very few viewers would likely be exposed to the view of the tower lights.

4. Analyze potential visual impacts from Saddleback Lake and Loon Lake – providing photos or a narrative description of conditions on the ground supporting any assertions about potential visual impact (see comment 3,b,ii-iii).

The viewshed analysis prepared by TJD&A indicates that the proposed telecommunications tower would not be visible from either Saddleback Lake or Loon Lake. This is analysis relied on computer modeling using LiDAR data to generate both a Digital Surface Model (DSM) and a Digital Terrain Model (DTM). The computer-based viewshed analysis determined whether the top of the tower (where the light is located) would be visible from any point on the landscape with the 8-mile APE. Since the analysis did not show any visibility from either lake, no photographs are provided with this analysis.

Google Earth viewshed modelling indicates that the light may be visible from small portions of each of these waterbodies if vegetation were not present. On Loon Lake this area of potential is located on the western end where there is no development or road access. On Saddleback Lake this viewshed area is located on the northeastern shoreline characterized by a small number of waterfront residences and largely unbroken, wooded shoreline. The accuracy of the Google Earth viewshed modelling cannot be verified, since the source of data and methodology is unknown.

5. Explain how bright the nighttime lighting would be in the fore-ground, mid-ground, and back-ground (consider including comparative examples and describing existing lighting that may also be visible from a given vantage point) (see comment 3,c,i).

Describing the brightness of nighttime lighting in words is a challenging task, since there are so many variables that contribute to a person's perception of brightness. This includes distance to viewer, weather/atmospheric conditions at the time of viewing, intensity of the light (candelas), background lighting surrounding or near the light source (context), lighting surrounding the viewer's position, amount of light in the sky from sun, etc. This difficulty is reflected in other professional publications, such as this description from *A Visual Impact Assessment for Wind Energy Projects for the Clean Energy States Alliance*:

> There is debate as to whether or not project lighting (FAA-required obstruction lighting) can be accurately simulated. Lighting is affected by numerous variables. Observing existing obstruction lighting is the best approach. Videography approaches are improving and combined with simulation software such as 3D Studio Max, which can compensate for variables such as refraction, reflected light, the source light, and shadows, reasonable lighting simulations can be created. Nevertheless, professionals who have created these simulations agree that they need to be adjusted using field comparisons of similar lighting situations. They will also be affected by viewing conditions such as room lighting, computer brightness settings, etc. Professionals agree that lighting simulations cannot be accurately printed as still images. [10]

TJD&A has observed and photographed FAA lighting in various places – Greenville, Rangeley, Lincoln, and New Gloucester, Maine, as well as the Outer Banks of North Carolina. The following are some of our observations regarding brightness and visibility:

- Photographing FAA lighting is very difficult. By nature of the subject matter and time of day (or night), a time exposure is necessary to capture the light as well as some semblance of the surrounding landscape.
- The cell tower uses an L-864 light, which consists of a white strobe light during the day (20,000 candelas) and a red pulsing light at night (2,000 candelas) flashing approximately 30 times per minute.
- The requirements for lighting also include two or more L-810 obstruction lights mounted at the midpoint. These are configured to flash in sync with the L-864 light at the top of the tower. These are relatively dim lights (32 candela) compared to the top light (2,000 candela).

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[10] J. Vissering, M Sinclair and A Margolis. *A Visual Impact Assessment Process for Wind Energy Projects*, Clean Energy States Alliance, May 2011

- Red lights tend to produce a halo effect when photographed, especially with time exposures. This tends to intensify the visual effect by making the source of light appear to be larger than it actually is.
- In waterfront locations, the lighting may be reflected in the body of water between the light source and the observer. In certain circumstances (generally on nights with soft breezes that cause small waves), the reflections are seen as vertical streaks of light on the water as the light is reflected off the tops of the waves. In still conditions (i.e., little or no wind), the reflection will appear as a diffused glow.
- Accompanying this narrative is a selection of photographs (Attachment C) and video clips (Attachment D) that illustrate the difference in light intensities at varying distances. In order to get a true perspective of the effect and relative brightness, the reviewer should examine these images in a dark room, allowing ample time for their eyes to adjust to the darkness.
- The photosimulations provided by TJD&A were developed in 3D Studio Max and Photoshop, using input that described the distance to the light source, the time of day / evening, and wattage of the light source. The images were then compared to photographs taken by TJD&A at comparable distances and adjusted accordingly to approximate reality.
- While the individual photosimulations provide a realistic view of the light in the 'on' position, the review should consider how the flashing pattern would attract an observer's attention (in much the same way that it is designed to alert a pilot to a possible obstruction). One way to do this is to view the PDF of the photosimulations in SlideShow mode and toggle back and forth between existing conditions and the image showing the proposed FAA light: approximately one second on, one second off.
- In the foreground (within 0.5 mile) the light atop a tower will appear as bright as a vehicle taillight. It will be considerably brighter than any of the stars that may be visible. At that distance the observer will be able to recognize the vertical shape of the bulb.
- In the midground (from 0.5 mile to 3 to 5 miles away) the light will be consistently as bright or brighter than the brightest star. The source of the light will appear as a single very distinct point.
- Lights seen in the background will still be highly visible (required by FAA to be effective in alerting pilots), but not to the extent of lights seen in the midground range. Lights in this range tend to be as bright as some of the stars.
- Lights are visible well beyond 8 miles. TJD&A observed and photographed the lights on a wind energy project in New Hampshire from the Rangeley Lake overlook and Dallas Hill Road, at distances of approximately 35 miles. While they were faint, they were plainly visible to the unaided eye.

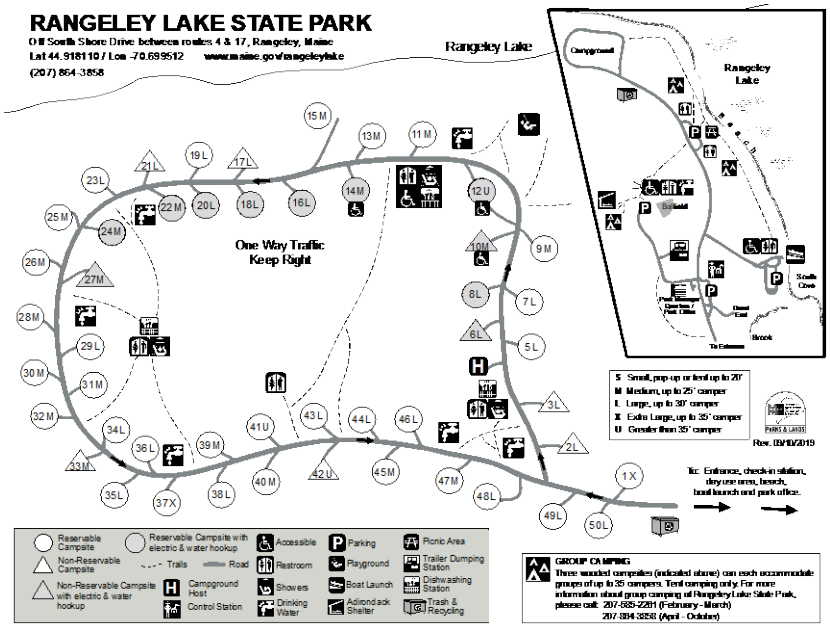
6. Provide nighttime photo simulations for views from campsites and the public beach area at Rangeley Lake State Park (see comment 3,b,ii).

Based upon field visits by TJD&A, there are no open views of the proposed tower from campsites within Rangeley Lake State Park. The tower will be located to the east at a distance of 5.7 miles. As noted on the campground map below, the main campground (and playground) has water on the north side. Individual sites are generally set back from the edge of the water with only occasional filtered views of the lake.

There are group sites on either side of the beach which do face east. However, these sites are also very well screened and set back from the edge of the lake.

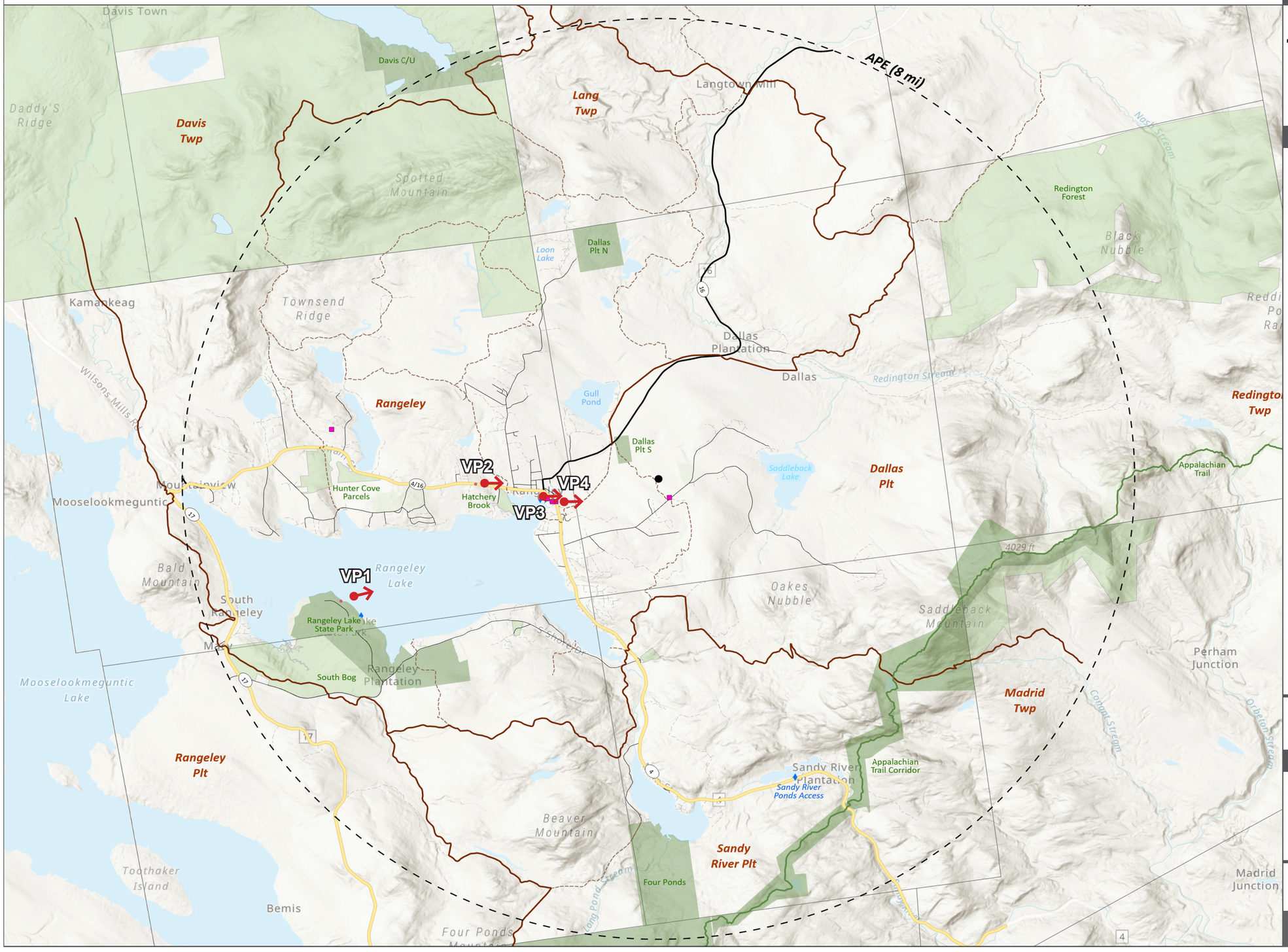
The public beach, on the other hand, looks directly at the mountains, Rangeley Village, and the site of the proposed tower (See Visual Simulations, Viewpoint 1: Rangeley Lake State Park in Attachment B). The visual impact of the FAA lighting on the State Park should consider a number of mitigating factors:

- The telecommunications tower lighting will be in context with streetlights, vehicle headlights, and lit buildings in the village. There are two major differences, however. Unlike the existing village lights, the FAA light is red (unlike the white existing lights) and it flashes 30± times per minute.
- Viewers at the beach already see one other communications tower with FAA lighting on the north side of Rangeley Lake on Route 4. This tower is approximately 3.0 miles from the beach, so its intensity should be somewhat greater than the proposed tower.
- According to the gatekeeper at the State Park, there is virtually no use of the beach or the boat launch after dark. This may be due to the lack of lighting at these facilities, the nature of camping in general, and/or the presence of mosquitoes and other insects that appear after sunset.



Dallas Plantation Telecommunication Facility

Attachment A: Project Map & Viewshed Analysis



PROJECT MAP

DALLAS PLANTATION TELECOMMUNICATION FACILITY

PROJECT MAP

LEGEND

- Town Lines

Project Area

- Proposed Cell Tower
- Viewpoint Location

Scenic Resources

- Boat Launch
- Listed Historic Property
- Appalachian Trail
- ITS Trail
- Local Snowmobile Trail
- Scenic Byways
- Public Conservation Land
- Private Conservation Land

2 MILES

N

RISING TIDE TOWERS

tjd&a Landscape Architects & Planners

2 July 2021

Dallas Plantation Telecommunication Facility

Attachment A: Project Map & Viewshed Analysis

COMPUTER-BASED VIEWSHED ANALYSIS

VIEWSHED MAP A

Potential Visibility Of Telecommunication Tower Using Topographic Surface Only

LEGEND

- Town Lines

Project Area

- Proposed Cell Tower
- Viewpoint Location
- Tower Visibility

Scenic Resources

- Boat Launch
- Listed Historic Property
- Appalachian Trail
- ITS Trail
- Local Snowmobile Trail
- Scenic Byways
- Public Conservation Land
- Private Conservation Land

ANALYSIS NOTES

Map shows where the FAA Aviation Warning Light on the proposed cell tower may be visible within the 8-mile area of potential effect (APE). The analysis relies on the screening effects of topography-only surface data. This data does not account for the screening effects of vegetation and structures.

The analysis is based on a Digital Surface Model (DSM) processed at 3 ft resolution from first return LIDAR data acquired from the USGS National Map. The viewer height is set at 5 ft above ground level elevation.

2 MILES

N

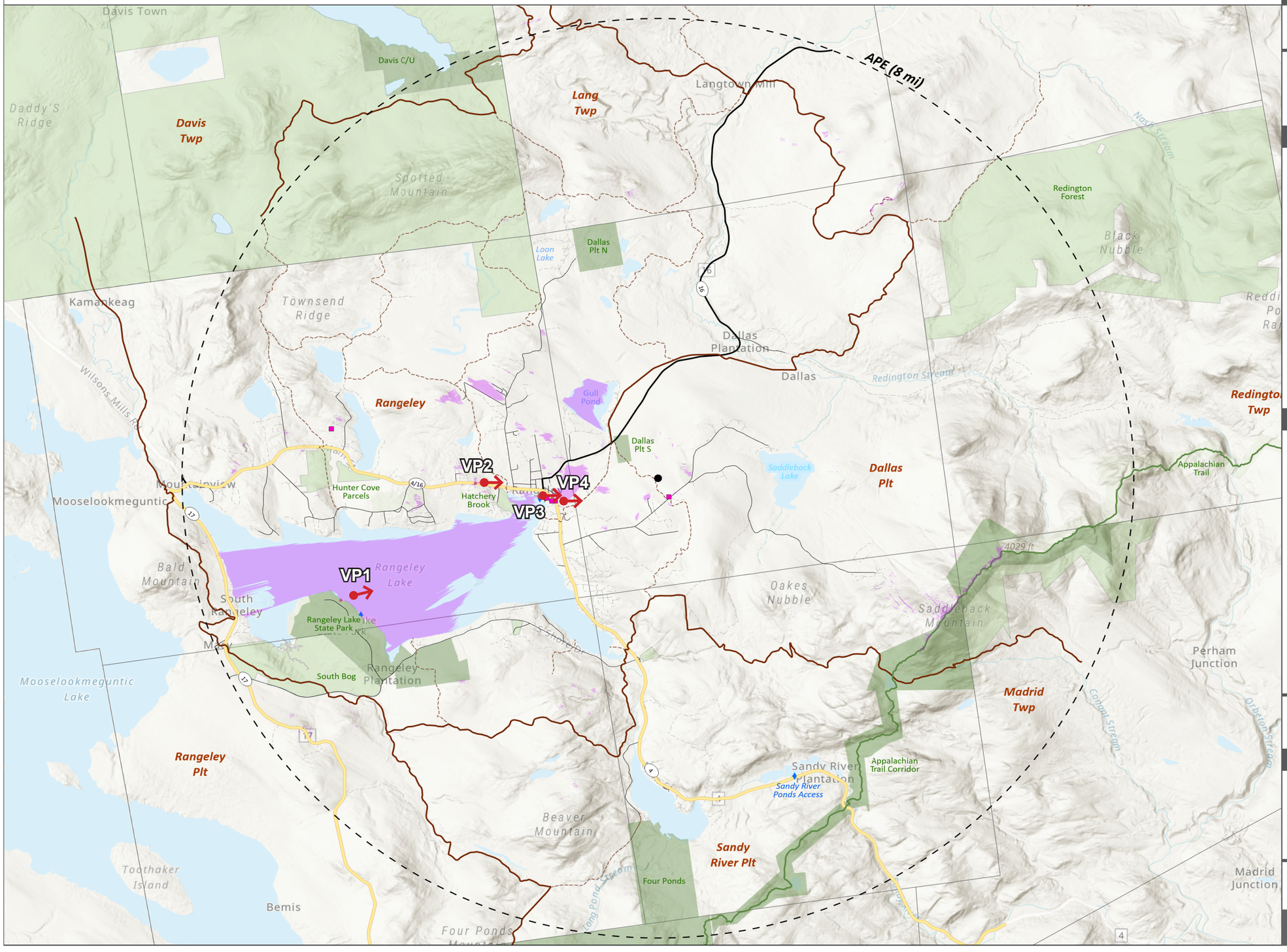
RISING TIDE TOWERS

tjd&a Landscape Architects & Planners

2 July 2021

Dallas Plantation Telecommunication Facility

Attachment A: Project Map & Viewshed Analysis



COMPUTER-BASED VIEWSHED ANALYSIS

VIEWSHED MAP B

Potential Visibility Of Telecommunication Tower Using Digital Surface Model

LEGEND

- Town Lines

Project Area

- Proposed Cell Tower
- Viewpoint Location
- Tower Visibility

Scenic Resources

- Boat Launch
- Listed Historic Property
- Appalachian Trail
- ITS Trail
- Local Snowmobile Trail
- Scenic Byways
- Public Conservation Land
- Private Conservation Land

ANALYSIS NOTES

Map shows where the FAA Aviation Warning Light on the proposed cell tower may be visible within the 8-mile area of potential effect (APE). The analysis relies on the screening effects of both topography and surface data (accounting for vegetation and structures such as buildings).

The analysis is based on a Digital Surface Model (DSM) processed at 3 ft resolution from first return LIDAR data acquired from the USGS National Map. The viewer height is set at 5 ft above ground level elevation.

2 MILES

N

RISING TIDE TOWERS

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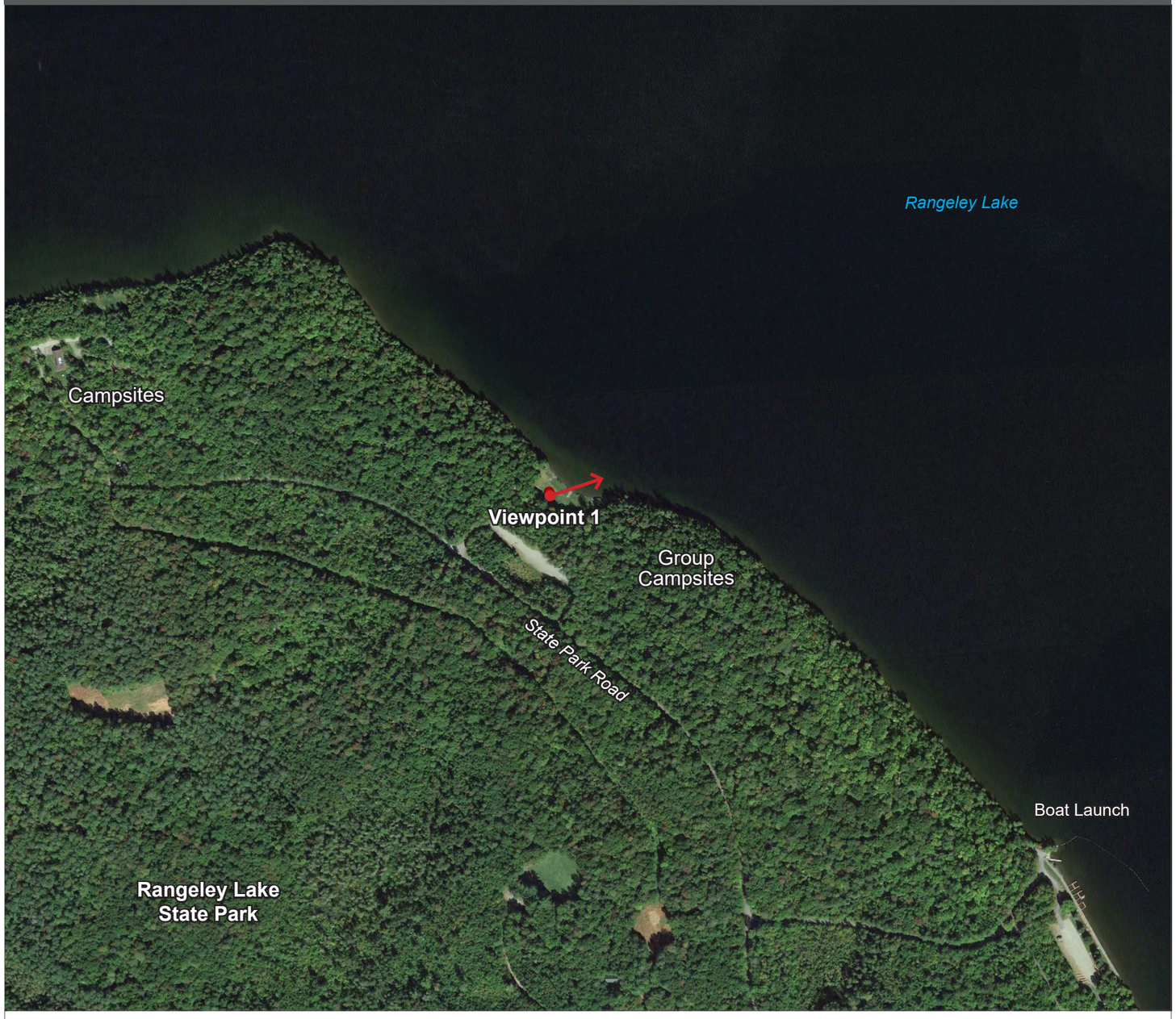
2 July 2021

Telecommunications Facility, Dallas Plantation, ME

VIEWPOINT 1: Rangeley Lake State Park

CONTEXT MAP



Visual Simulation Location

500 FEET

NORTH

VIEWPOINT

Rangeley Lake State Park, Rangeley

Beach & Picnic Area

View looking northeast from the Beach and Picnic Area in Rangeley Lake State Park.

IMAGE DATA

LOCATION

Date	June 10 2021
Time	5:40pm & 8:46pm
Latitude	44.938474°
Longitude	-70.714039°
Direction of View	Northeast
Distance to Tower	5.74 Miles

PHOTO

Viewpoint #	1
Camera	NIKON D750
Resolution	300 dpi
Focal Length	50mm
Viewer Eye Elevation	1,532 Feet

Telecommunications Facility
Dallas Plantation, ME

RISING TIDE TOWERS

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Telecommunications Facility, Dallas Plantation, ME

VIEWPOINT 1: Rangeley Lake State Park

EXISTING IMAGE

VIEWPOINT 1

Beach & Picnic Area

Day

EXISTING CONDITIONS

IMAGE NOTE

When printed on 11x17 inch paper, viewer should hold this image approximately 21 inches from eye to replicate actual view.

RISING TIDE TOWERS

tjd&a

2 July 2021

Telecommunications Facility, Dallas Plantation, ME

VIEWPOINT 1: Rangeley Lake State Park

SIMULATION

VIEWPOINT 1

Beach & Picnic Area

Day

VISUAL SIMULATION

IMAGE NOTE

When printed on 11x17 inch paper, viewer should hold this image approximately 21 inches from eye to replicate actual view.

RISING TIDE TOWERS

tjd&a

2 July 2021

Telecommunications Facility, Dallas Plantation, ME

VIEWPOINT 1: Rangeley Lake State Park

EXISTING IMAGE

VIEWPOINT 1

Beach & Picnic Area

Dusk

EXISTING CONDITIONS

IMAGE NOTE

When printed on 11x17 inch paper, viewer should hold this image approximately 21 inches from eye to replicate actual view.

RISING TIDE TOWERS

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Telecommunications Facility, Dallas Plantation, ME

VIEWPOINT 1: Rangeley Lake State Park

SIMULATION

VIEWPOINT 1

Beach & Picnic Area

Dusk

VISUAL SIMULATION

IMAGE NOTE

When printed on 11x17 inch paper, viewer should hold this image approximately 21 inches from eye to replicate actual view.

RISING TIDE TOWERS

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Telecommunications Facility, Dallas Plantation, ME

VIEWPOINT 2: Rangeley Lakes National Scenic Byway (Route 4)

CONTEXT MAP

Visual Simulation Location

500 FEET

NORTH

VIEWPOINT

Rangeley Lakes National Scenic Byway (Route 4), Rangeley

Route 4

View looking east from Route 4, part of the Rangeley Lakes National Scenic Byway.

IMAGE DATA

LOCATION

Date	June 11 2021
Time	2:51pm & 9:19pm
Latitude	44.968135°
Longitude	-70.668051°
Direction of View	East
Distance to Tower	3.1 Miles

PHOTO

Viewpoint #	2
Camera	NIKON D750
Resolution	300 dpi
Focal Length	50mm
Viewer Eye Elevation	1,709 Feet

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Dallas Plantation, ME

RISING TIDE TOWERS

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Telecommunications Facility, Dallas Plantation, ME

VIEWPOINT 2: Rangeley Lakes National Scenic Byway (Route 4)

EXISTING IMAGE

VIEWPOINT 2

Route 4

Day

EXISTING CONDITIONS

IMAGE NOTE

When printed on 11x17 inch paper, viewer should hold this image approximately 21 inches from eye to replicate actual view.

RISING TIDE TOWERS

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Telecommunications Facility, Dallas Plantation, ME

VIEWPOINT 2: Rangeley Lakes National Scenic Byway (Route 4)

SIMULATION

VIEWPOINT 2

Route 4

Day

VISUAL SIMULATION

IMAGE NOTE

When printed on 11x17 inch paper, viewer should hold this image approximately 21 inches from eye to replicate actual view.

RISING TIDE TOWERS

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VIEWPOINT 2: Rangeley Lakes National Scenic Byway (Route 4)

EXISTING IMAGE

VIEWPOINT 2

Route 4

Night

EXISTING CONDITIONS

IMAGE NOTE

When printed on 11x17 inch paper, viewer should hold this image approximately 21 inches from eye to replicate actual view.

RISING TIDE TOWERS

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Telecommunications Facility, Dallas Plantation, ME

VIEWPOINT 2: Rangeley Lakes National Scenic Byway (Route 4)

SIMULATION

VIEWPOINT 2

Route 4

Night

VISUAL SIMULATION

IMAGE NOTE

When printed on 11x17 inch paper, viewer should hold this image approximately 21 inches from eye to replicate actual view.

RISING TIDE TOWERS

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Telecommunications Facility, Dallas Plantation, ME

VIEWPOINT 3: Lakeside Park

CONTEXT MAP

Visual Simulation Location

500 FEET

NORTH

VIEWPOINT

Lakeside Park, Rangeley

Park Peninsula

View looking east from the westernmost peninsula in Lakeside Park.

IMAGE DATA

LOCATION

Date	June 10 2021
Time	6:27pm & 10:13pm
Latitude	44.964799°
Longitude	-70.646310°
Direction of View	East
Distance to Tower	2 Miles

PHOTO

Viewpoint #	3
Camera	NIKON D750
Resolution	300 dpi
Focal Length	50mm
Viewer Eye Elevation	1,524 Feet

Telecommunications Facility
Dallas Plantation, ME

RISING TIDE TOWERS

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VIEWPOINT 3: Lakeside Park

EXISTING IMAGE

VIEWPOINT 3

Park Peninsula

Day

EXISTING CONDITIONS

IMAGE NOTE

When printed on 11x17 inch paper, viewer should hold this image approximately 21 inches from eye to replicate actual view.

RISING TIDE TOWERS

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Telecommunications Facility, Dallas Plantation, ME

VIEWPOINT 3: Lakeside Park

SIMULATION

VIEWPOINT 3

Park Peninsula

Day

VISUAL SIMULATION

IMAGE NOTE

When printed on 11x17 inch paper, viewer should hold this image approximately 21 inches from eye to replicate actual view.

RISING TIDE TOWERS

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Telecommunications Facility, Dallas Plantation, ME

VIEWPOINT 3: Lakeside Park

EXISTING IMAGE

VIEWPOINT 3

Park Peninsula

Night

EXISTING CONDITIONS

IMAGE NOTE

When printed on 11x17 inch paper, viewer should hold this image approximately 21 inches from eye to replicate actual view.

RISING TIDE TOWERS

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Telecommunications Facility, Dallas Plantation, ME

VIEWPOINT 3: Lakeside Park

SIMULATION

VIEWPOINT 3

Park Peninsula

Night

VISUAL SIMULATION

IMAGE NOTE

When printed on 11x17 inch paper, viewer should hold this image approximately 21 inches from eye to replicate actual view.

RISING TIDE TOWERS

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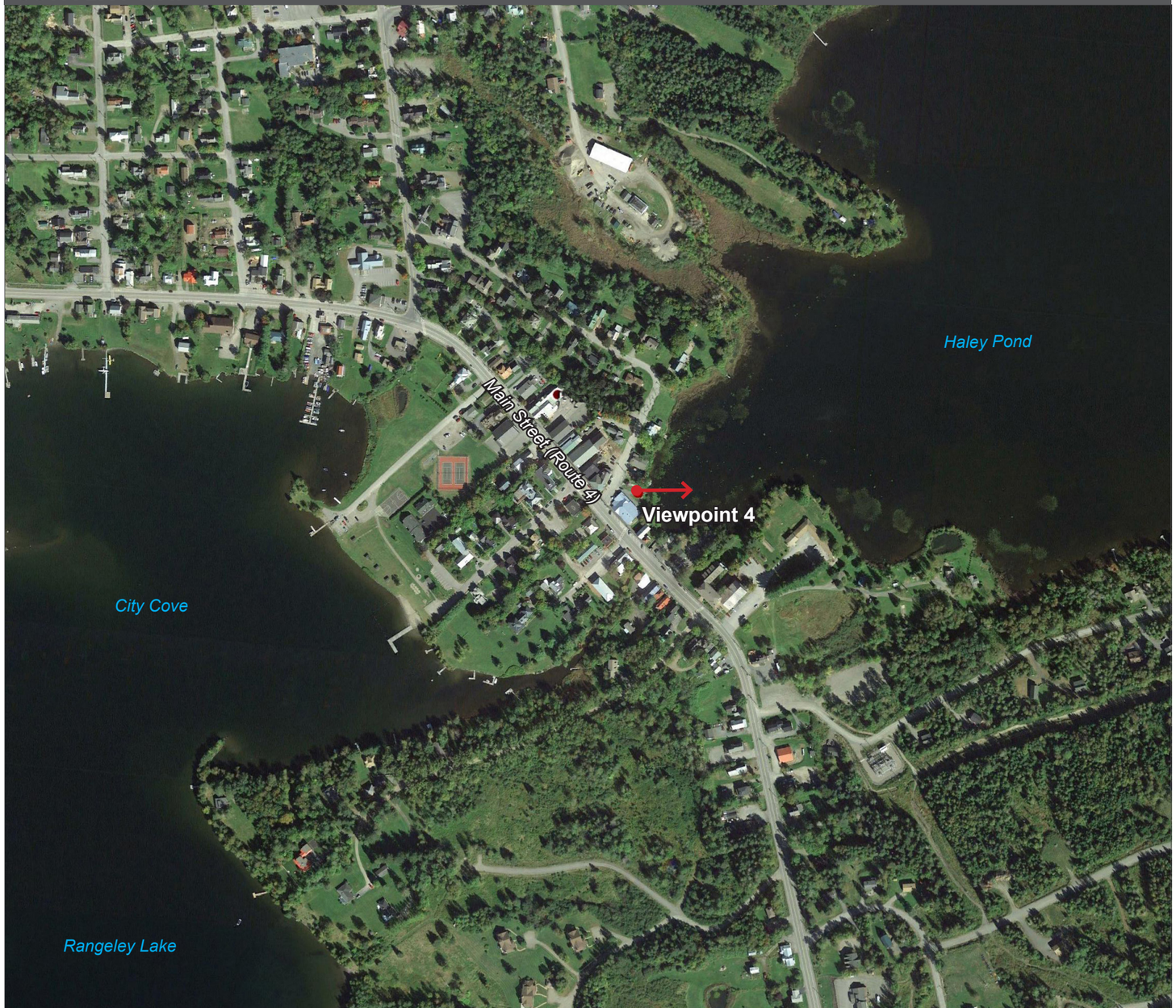
Telecommunications Facility, Dallas Plantation, ME

VIEWPOINT 4: Haley Park

CONTEXT MAP



Visual Simulation Location

500 FEET

NORTH

VIEWPOINT

Haley Park, Rangeley

Boat Launch Ramp

View looking east from the Boat Launch Ramp in Haley Park.

IMAGE DATA

LOCATION

Date	June 10 2021
Time	5:54pm & 9:42pm
Latitude	44.964732°
Longitude	-70.641615°
Direction of View	East
Distance to Tower	1.8 Miles

PHOTO

Viewpoint #	4
Camera	NIKON D750
Resolution	300 dpi
Focal Length	50mm
Viewer Eye Elevation	1,532 Feet

Telecommunications Facility
Dallas Plantation, ME

RISING TIDE TOWERS

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Telecommunications Facility, Dallas Plantation, ME

VIEWPOINT 4: Haley Park

EXISTING IMAGE

VIEWPOINT 4

Boat Launch Ramp

Day

EXISTING CONDITIONS

IMAGE NOTE

When printed on 11x17 inch paper, viewer should hold this image approximately 21 inches from eye to replicate actual view.

RISING TIDE TOWERS

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Telecommunications Facility, Dallas Plantation, ME

VIEWPOINT 4: Haley Park

SIMULATION

VIEWPOINT 4

Boat Launch Ramp

Day

VISUAL SIMULATION

IMAGE NOTE

When printed on 11x17 inch paper, viewer should hold this image approximately 21 inches from eye to replicate actual view.

RISING TIDE TOWERS

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Telecommunications Facility, Dallas Plantation, ME

VIEWPOINT 4: Haley Park

EXISTING IMAGE

VIEWPOINT 4

Boat Launch Ramp

Night

EXISTING CONDITIONS

IMAGE NOTE

When printed on 11x17 inch paper, viewer should hold this image approximately 21 inches from eye to replicate actual view.

RISING TIDE TOWERS

tjd&a

Telecommunications Facility, Dallas Plantation, ME

VIEWPOINT 4: Haley Park

SIMULATION

VIEWPOINT 4

Boat Launch Ramp

Night

VISUAL SIMULATION

IMAGE NOTE

When printed on 11x17 inch paper, viewer should hold this image approximately 21 inches from eye to replicate actual view.

RISING TIDE TOWERS

tjd&a

ATTACHMENT C: PHOTO COLLECTION

The photographs in this collection captured night-time conditions at various locations to demonstrate lighting under different conditions. The best way to view these photos is in a dark room with the computer set at full screen to minimize the distraction of outside light sources.

The photo collection is available digitally at:

https://spatialalt.sharefile.com/d-sf131547777c94764b06b18a253512ee6

Also see video clips in Attachment D for additional representation of FAA warning lights in the landscape.

PHOTO 1 – Photo taken in Greenville, ME at Kineo View Motor Lodge at 9:20pm on 5.25.2021. Distance from the light source is 900± feet. Moonlit night, which decreases the contrast between the sky on the warning light. See videos #3-7543 and #4-7522 in Attachment D for longer views. Light appears less bright, which may be due to cut-off design of fixture.

PHOTO 2 – Photo taken from same location as Photo 2 above, a few minutes later after moon disappears. Light appears brighter, which may be due to increased contrast with darker skies. Or change in ISO in iPhone.

PHOTO 3 – Photo taken at Rangeley Lake State Park Beach at 9:17pm on 6.10.2021. Distance from the light source is 3.0 miles. Same location as video #2-6899 in Attachment D. Flat blue light caused by overexposed image. Light however, appears to resemble reality, especially compared to lights in Rangeley village.

PHOTO 4 – Photo taken in Rangeley, ME on the Route 4 Scenic Byway at 9:18pm on 6.11.2021. Distance from the light source is 500± feet. Relatively new cell tower west of Rangeley village. Close-up view of tower adjacent to location of Viewpoint 2 in Photosimulation package.

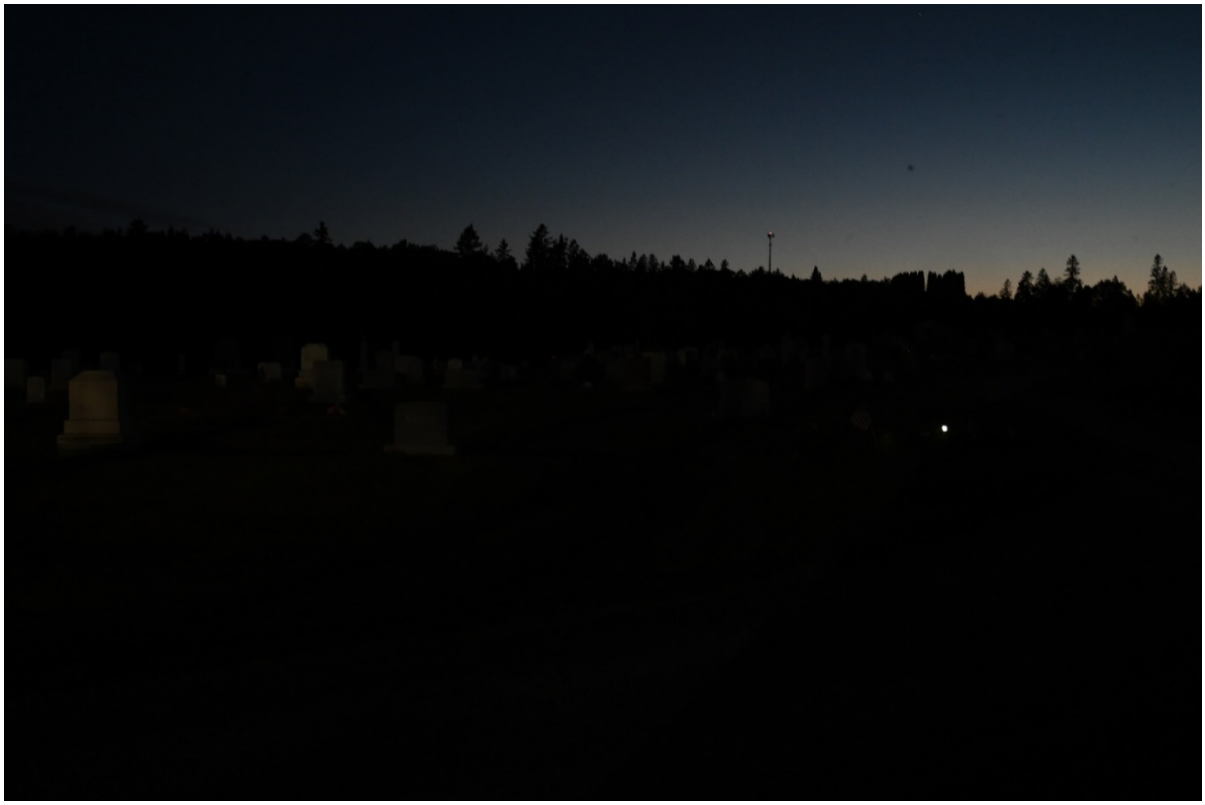

PHOTO 5 – Photo taken in Rangeley, ME on the Route 4 Scenic Byway at 9:32pm on 6.11.2021. Distance from the light source is 0.5± miles. Same cell tower viewed at edge of foreground viewing distance. Light appears as single point. Wide angle lens makes tower appear farther away. Sky was actually much darker.

PHOTO 6 – Photo taken south of Rangeley village from the Route 4 Scenic Overlook at 10:09pm on 6.11.2021. Distance from the light source is 1.95 miles. Same cell tower viewed from Rangeley Lake scenic overlook. Skies were almost black. Light appeared almost as bright as the brightest stars. 20 second time exposure intensifies brightness. Stars appear in image that were not visible or barely visible. See video #5-7954 in Attachment D.

PHOTO 7 – Photo taken in Rangeley village on Dallas Hill Road at 9:56pm on 6.11.2021. Distance from the light source is 35± miles. Series of aviation warning lights on the Granite Reliable Wind Park in Millsfield, New Hampshire. 20 second time exposure accentuates brightness. Lights are clearly visible to unaided eye. Observation is in line with Sullivan's work on visibility.

PHOTO 8 – Photo taken in Lincoln, ME on Mattanawcook Pond at 9:31pm on 6.8.2011. Distance from the light source is 6 to 7 miles. View from gazebo in downtown Lincoln. 5 second time exposure intensifies brightness of the warning lights.

PHOTO 9 – Photo taken in Lincoln, ME on Upper Pond at 10:21pm on 6.8.2011. Distance from the light source is 2 to 4 miles. Right half of a panorama of a portion of the Rollins Wind Project near Lincoln. 25 second time exposures capture the streaking patterns created by lights reflected off small waves. Halo effect intensified by long exposure.

PHOTO 10 – Photo taken in Lincoln, ME on Upper Pond at 10:23pm on 6.8.2011. Distance from the light source is 2 to 4 miles. Left half of a panorama of a portion of the Rollins Wind Project near Lincoln.

PHOTO 11 – Photo taken in Burlington and Grand Falls TWP, ME on Saponac Pond on an evening in 2011. Distance from the light source is 2 to 4 miles. Existing conditions on Passadumkeag Mountain. Photographed as part of application for the Passadumkeag Wind Project. Adjusting exposure illustrates how change in ambient light affects visibility of warning light. Note reflection of red light in Saponac Pond.

ATTACHMENT D: VIDEO CLIPS

The video clips are available digitally at:
https://spatialalt.sharefile.com/d-s723487c4c52e45d99e7618df4c39edb9

Video clips were collected at various locations to demonstrate lighting under different conditions. The best way to view these videos is in a dark room with the computer set at full screen to minimize the distraction of outside light sources. Also see the photos collection in Attachment C for additional representation of FAA warning lights in the landscape.

The table below provides the basic information for each video clip.

#	Video Clip Location	Distance from Light Source	Time/Date	Notes
1-6898	Rangeley Lake State Park Beach	3.0 miles	9:10pm / 6.10.2021	Cell tower on Route 4 on north side of Rangeley Lake. Video slightly overexposed (sky was actually darker). Proposed tower will be 5.7 miles from the park.
2-6899	Rangeley Lake State Park Beach	3.0 miles	9:14pm / 6.10.2021	Same location as #6898, 4 minutes later. Sky color more approximates reality. Red light appears white in both images.
3-7543	Greenville, ME on Route 15 south of town	1.4 miles	9:14pm / 5.26.2021	Very dark skies with little ambient light. Initial frames are in focus showing light as a single point. Once car passes focus changes and light becomes blurred. Intensity of light is equivalent to taillight of car at end of clip, which has traveled approximately ¼ mile in 18 seconds at 50 MH.
4-7522	Greenville, ME on Route 15 south of town	1.4 miles	6:48pm / 5.26.2021	Same location as #7543, but prior to sunset. White strobe light visible, but not as noticeable as the red warning light.
5-7954	Route 4 Scenic Overlook south of Rangeley village	1.95 miles	10:05pm / 6.11.2021	Cell tower on Route 4 viewed from Rangeley Lake scenic overlook. Skies were almost black. Light appeared almost as bright as the brightest stars, which do not show up in video. See exposure time in Photo 7 in Attachment C.
6-7957	Route 4 (Main Street) Rangeley, corner of Grandview Avenue	2.86 miles	11:48pm / 6.11.2021	Cell tower on Loon Lake Road as seen from Main Street.
7-8338 8-8340 9-8342	Outer Banks, North Carolina	2.8 miles	8:24pm / 6.22.2021 8:43pm / 6.22.2021 9:58pm / 6.22.2021	Progression of videos toward lights on a water tank and a communications tower. Taken from third floor of a beachfront hotel. Weather conditions were somewhat hazy. Video accurately shows pin-point light in relation to surrounding light sources.