



## Methow Valley Airport Beacon

### **VISUAL REPORT**

February, 2013



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# Acronyms and Abbreviations

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ACP	Asphalt Concrete Pavement
CSS	Context Sensitive Solutions
dbh	diameter at breast height
EB	Eastbound
FHWA	Federal Highway Administration
GIS	Geographic Information Systems
MP	Mile Post
NEPA	National Environmental Policy Act
NHS	National Highway System
SEPA	State Environmental Policy Act
USFS	U.S. Forest Service
WB	Westbound
WSDOT	Washington State Department of Transportation

# Introduction

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## What is the Methow Valley Airport Beacon Visual Study?

The Methow Valley State Airport is part of the National Plan of Integrated Airport Systems (NPIAS). The Federal Aviation Administration (FAA) recognizes NPIAS airports as public-use airports that are vital to serving the public needs for air transportation. NPIAS airports must meet certain FAA requirements. One of FAA's requirements is that a NPIAS airport must periodically update its Airport Layout Plan. The purpose of an Airport Layout Plan is to define the current, short-term, and long-term needs of the airport through a comprehensive evaluation of existing conditions and FAA airport planning and design standards.

Beginning in March 2008, the Washington State Department of Transportation-Aviation Division (WSDOT-Aviation) contracted with Century West Engineering to update the Methow Valley State Airport's Airport Layout Plan, which had not been updated since 1995. As a part of this process, community input was sought by Century West and WSDOT-Aviation, including:

- The formation of a public advisory committee, made up of members of the local community.
- Public meetings:
  - March 25, 2008 – Aero Methow Rescue training room
  - November 18, 2008 – Aero Methow Rescue training room
  - March 19, 2009 – Twisp Community Center
  - May 20, 2009 – Sun Mountain Lodge, to present the preferred alternative produced by the Plan

Following the May 20 public meeting, WSDOT-Aviation hosted a 30-day public review and comment period, with documents posted on the WSDOT-Aviation website. Based upon comments provided, refinements were made that led to the final Airport Layout Plan-Preferred Alternative, which was accepted by WSDOT-Aviation on July 1, 2009.

NPIAS airports are eligible to apply through FAA for federal funding of improvements. WSDOT-Aviation applied for and received a federal grant for this purpose. Safety improvements at the airport included replacing the existing airport lighting and signing, adding visual approach aids, improving the airport's security, clearing obstructions, and improving the surface grading

at both runway ends. These improvements were intended to enhance the safety and operations of the airport.

Upon substantial completion of the improvements project by July 14, 2012, WSDOT-Aviation activated the new rotating beacon, which replaced the previous pilot-activated beacon that was removed from service during winter 2007-2008. This new beacon meets FAA standards. This type of beacon is operated from dusk to dawn at light intensity between 25,000 and 50,000 candelas at angles of 1 to 10 degrees operating at 22 to 26 flashes per minute—flash duration of 75 to 300 milliseconds (ms)—and at an angle between 1 and 10 degrees measured at the center of the light beam. In no case shall the elevation of the beam adjustment be less than 2 degrees above the horizon. The Methow Airport's beacon was set to 5 degrees, which is the factory setting, and is now set at 8 degrees. Public response was immediate and highly unfavorable. Residents reported that the sweeping beam filled the interiors of their homes, preventing sleep, and blotted out the night sky environment, which is highly valued by the Methow Community. Several residents expressed concern for the local and transient wildlife in the area.

Following are examples of the feedback received at the time of activation and after the visual testing. All feedback received by WSDOT-Aviation in regard to this matter is included in Appendix A.

We live in the Methow valley overlooking the Winthrop Airport. This valley is known for its natural beauty, which includes the night skies resplendent with the milky way, planets, and sometimes, the Northern Lights. People in this valley are very conscientious about "Dark Sky" standards and work to keep the natural beauty primary in many ways, including reducing or eliminating outdoor lighting.

The new beacon at the Winthrop airport is massively intrusive to this environment. Our night time view is essentially eliminated since it turned on the night of 7/14/12. It turns around and around at 5 second intervals, illuminating only the hills on the surrounding valley, and the windows of the neighbors. It is the most obnoxious possible installation in this setting. I could see the light through my closed eyes last night and lost many hours of sleep.

I note the laudable intent of the airport improvement project: Safety. However, there is a glitch: Hardly any aircraft use the Methow facility. We watch the airport continuously and see occasional daytime aircraft come and go, including smokejumpers. However, the light is on all night, and over 4 years of residency, I cannot remember ever seeing a night landing of an airplane. Please note: The Winthrop airport has very light traffic, and virtually none at night. This beacon adds no tangible safety benefit to the airport, and has a substantial environmental and social impact. There are no regularly travelled flight paths over the Methow Valley, particularly at night.

This light could also disrupt night migrations of songbirds and bats at critical times of the year. Was this considered as a project impact?

It is my understanding that in the analysis of the original project it was emphasized that the new lighting system would be activated only by pilots when approaching, and therefore save our beautiful night skies. This is a good idea. Why is not the beacon attached to this same system?

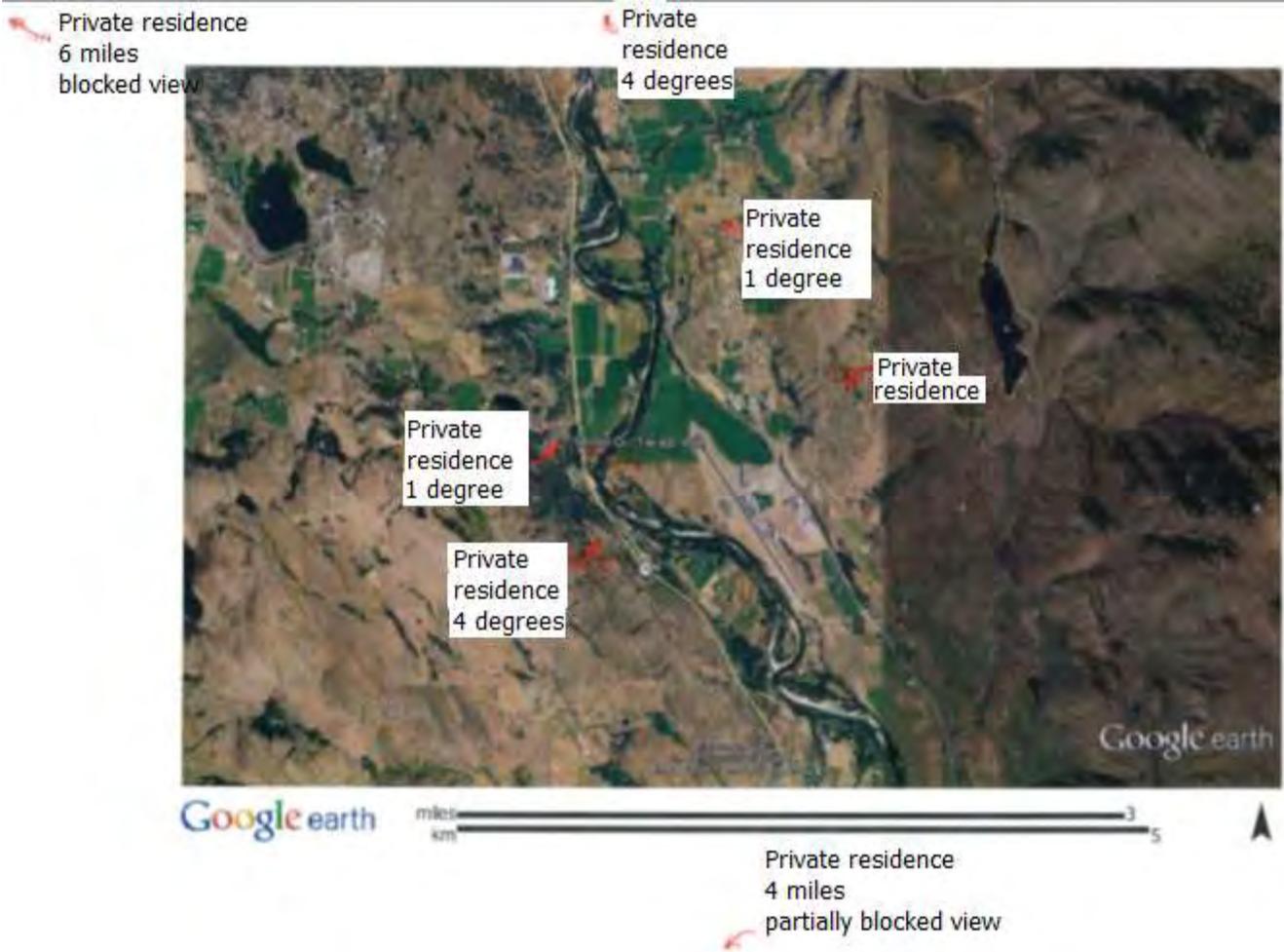
The new Winthrop Airport beacon is a massive detriment to the quality of life in the mid Methow Valley. It serves no useful purpose and a sensible alternative exists for making it meaningful (i.e. pilot activated). Please, immediately place the beacon onto the same system as the runway lights (or turn it off) and save our night skies, our local beauty, and the neighbor's sanity.

Residents who contributed the initial feedback to WSDOT-Aviation had impacted homes at various elevations, ranging from approximately 1,600' to over 2100', and they were located in all four directions from the airport beacon. Some of the reporting residents had homes that could be expected to have experienced direct impacts from the beacon, and some were partially or total blocked from direct effects and may have seen indirect impacts to the night sky.

Indirect impacts to the night sky environment is also called light pollution, photopollution, luminous pollution, or sky glow, and refers to the artificial lightening of the night sky by light that is excessive, obtrusive, or scattered from a beneficial source. Light pollution has been linked to disruption of the circadian rhythm in humans and to hormone imbalances in humans and other living organisms. Levels of acceptable artificial night lighting are subjective and it is an evolving area of study. Measurements of levels of light pollution (or sky glow) are in the early stages of becoming standardized, and are often not governed by any local, state, or federal authority.

WSDOT-Aviation turned the beacon off in response to community feedback on July 18, 2012.

Exhibit 1-1 shows the general locations of the citizens who responded to WSDOT-Aviation in regard to negative impacts of the new beacon. The degrees shown on the map identify the difference between the center of the beam and the location of the citizen responding based on the elevation and distance from the beacon.



According to [Chapter 16 of the \*Environmental Desk Reference for Airport Actions\*](#),<sup>1</sup> there are no federal statutory or regulatory requirements for adverse effects of airport lighting.

*No federal regulations govern light emissions or visual intrusions. However, FAA will consider potential effects to properties covered by Section 4(f) of the U.S. Department of Transportation (DOT) Act, Section 6(f) of the Land and Water Conservation Fund Act (LWCF) and Section 106 of the National Historic Preservation Act (NHPA). (Page 1)*

However, that chapter also states that “If potential light emissions or visual effects exist, the official should evaluate measures to lessen those as well.” This study is that evaluation.

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<sup>1</sup> Federal Aviation Administration Office of Airports – Office of Airport Planning and Programming – Airports Planning and Environmental Division, APP-400, October 2007

The Methow Valley State Airport project does not impact lands protected by Section 4(f) nor by Section 6(f). The State Historic Preservation Office was contacted during the Environmental Review process to determine whether the USFS North Cascades Smokejumper base qualified for inclusion under Section 106. The State Historic Preservation Officer determined that it did not. The *Airport Desk Reference* also makes note of the fact that no federal thresholds exist for light emission impacts.

Okanogan County code does not address airport lighting, and no night sky ordinances govern the airport. There is a "*Handbook of Suggested Development Guidelines*" that is used in the Methow Valley. While it could be applied to some of the lighting used at the airport, it does not specifically address airport beacons or runway lighting, and these lights are generally outside of its purview.

FAA does provide guidance for mitigation of light impacts, including but not limited to, those caused by airport beacons. This guidance includes altering the angle of the beam, shielding the lighting fixture, using directional lighting, and using minimal pole heights or reducing the wattage of the bulbs. Directional lighting, minimal pole heights, and reduced wattage bulbs used in lighting are typically mitigation efforts used for lighting of facilities at the airport, and are inappropriate for mitigation of an airport beacon.

FAA also recommends that a lighting study be conducted "in locales where high-intensity strobe lights shine directly into homes or other sensitive areas or habitats."

WSDOT does not have specific requirements concerning mitigation of light impacts from an airport beacon, but does recognize the importance of aesthetics and impacts to the visual environment. WSDOT-Aviation decided to prepare a Visual Impact Report to analyze beacon impacts and to address the concerns of local citizens. This report is prepared in accordance with Federal Highway Administration (FHWA) standards, and includes testing angle changes and light shielding of the beacon as suggested in the *FAA Airport Desk Reference*.

This report is intended to assess the light impacts in order to assist WSDOT-Aviation to begin the process of determining the appropriate mitigation for the light emission effects of the new rotating beacon. Accordingly, the following alternatives were tested and reviewed.

### ***Alternative 1: 8-Degree Angle***

Alternative 1 changed the angle of the rotating beacon from the manufacturer's recommended setting of 5 degrees to 8 degrees.

### ***Alternative 2: 10-Degree Angle***

Alternative 2 increased the angle of the rotating beacon to 10 degrees.

### ***Alternative 3: 12-Degree Angle with Baffling***

Alternative 3 adjusted the angle of the rotating beacon further to 12 degrees. This is outside of the allowable angle range required by FAA for this type of beacon. WSDOT-Aviation decided to test this angle to determine if enough mitigation was offered at this angle to warrant the pursuit of a "modification to standard" decision from FAA.

Shielding of the beacon was included in this alternative. This shielding covered the bottom third of the beacon light, blocking light emissions traveling at a downward angle and onto the reflective surface of the runway.

### ***Existing Conditions***

Existing conditions form the baseline for a visual analysis. In this instance, the existing condition is considered to be the view without the beacon turned on, which is most representative of the pilot-activated beacon system used by the airport prior to 2008.

## **Why is visual quality considered by WSDOT?**

The construction or modification of public facilities can have a considerable effect on the quality and character of the landscape.

The National Environmental Policy Act (NEPA) requires that all actions sponsored, funded, permitted, or approved by federal agencies undergo planning to ensure environmental considerations, such as effects related to aesthetics and visual quality, are given due weight in project decision making. The State Environmental Policy Act (SEPA) mandates a similar procedure for state and local actions.

Both SEPA and NEPA require that an environmental analysis be performed during project development to minimize harm to the human, physical, or biological environment. Both acts seek to provide safe, healthful, productive, and aesthetically and culturally pleasing surroundings.

## What vocabulary and tools are used in this visual quality assessment?

FHWA's method for assessing visual effects uses a generally accepted set of tools and well-defined terms to describe the visual effects assessment. This is composed of the following three criteria used to perform an appraisal of the landscape visual quality:

**Vividness:** The memorability of the visual impression received from contrasting landscape elements as they combine to form a striking and distinctive visual pattern.

**Intactness:** The integrity of visual order in the natural and built landscape, and the extent to which the landscape is free from visual encroachment or eyesores.

**Unity:** The degree to which the visual resources of the landscape join together to form a coherent, harmonious visual pattern. Unity refers to the compositional harmony or intercompatibility between landscape elements.

Expert evaluations based on the three criteria have proven to be good predictors of the visual quality using the following equation:

$$\text{Visual Quality} = \frac{\text{Vividness} + \text{Intactness} + \text{Unity}}{3}$$

Each of the three criteria is independent. Each is intended to evaluate one aspect of visual quality to determine the total visual quality rating for each viewpoint.

### ***Tools to Assess Visual Effects***

The basic components used to describe visual character for most visual assessments are the elements of form, line, color, and texture of the landscape features. To further define visual character, the appearance of the landscape can be defined in terms of its visible features, scale, diversity, and continuity. These components make up the perceived "grain" of the landscape.

The natural resources and features used to define visual character include:

- Landforms: Visual mass, scale, and shape of an object such as a mountain, hill, or plain.



- Vegetation: Species, color, size, maturity, form, placement and scale.



- Water forms: Existence in the view, mass, color, linear form, size, type, and condition of lakes, rivers, ponds, wetlands, estuaries, and oceans, including reflected light.

The human-use features and resources used to define visual character include the following:

- Land uses: Size, scale, and character of associated buildings and features making up land uses, including historic structures, downtown skylines, and the apparent upkeep and maintenance of the built environment.
- Transportation facilities: Types, sizes, scale, and orientation.
- Overhead utility structures and lighting: Types, sizes, and scale.
- Open space: Type (e.g., parks, reserves, greenbelts, and undeveloped land), extent, and continuity.
- Viewpoints and views to visual resources.

The FHWA Visual Assessment Method also uses three important analytical tools, which are described below:

- Landscape Character Units: Subunits of a study area that make evaluating the entire study area easier. Visual character and visual continuity define these landscape units. Landscape character units are experienced by a viewer as passing through outdoor “rooms.”
- Viewshed: Defined as the study area that viewers can see from a viewpoint or from which a viewpoint is seen.
- Visual Simulations: A means of graphically depicting the probable changes due to the project and the relative scales of the existing and proposed features apparent from the key viewpoints.

*Source: Visual Impact Assessment for Highway Projects, FHWA 1988.*

## **Quantitative Analysis**

FAA does not have an established methodology for reviewing the visual impacts of a project outside of NEPA. WSDOT routinely uses FHWA’s process for reviewing visual impacts to its projects. Although this is not a highway project, the FHWA methodology is well established and accepted and can be applied to an aviation project. The visual quality analysis was conducted in accordance with the U.S. Department of Transportation, FHWA *Visual Impact Analysis for Highway Projects* (FHWA, 1988). This study complies with the guidelines outlined in the WSDOT *Environmental Procedures Manual* (M 31-11), Chapter 459 “Visual Impacts.”

This visual quality report reviews and analyzes the visual or aesthetic effects of the Methow Valley Airport beacon replacement. Visual effects will be analyzed from five viewpoints, known as observations points. The analysis describes both the existing conditions with the beacon turned off, as well as the effect of the beacon modification upon the viewer.

Visual quality is inherently subjective. It reflects the perspective of the person (viewer) perceiving the visual environment and the various values, expectations, and interests the viewer relates to as the viewer processes the surroundings. WSDOT uses the FHWA methodology to evaluate the visual resource in an objective qualitative process. This method is rigorous and systematic. It ensures that the information gathered is adequate to contribute to the project decision-making process, and that the assessment and descriptions are as objective as possible. Visual assessments are prepared by trained professionals exercising professional judgment. The process is repeatable by other experts. The concerns of local citizens are taken into

consideration through the use of public documents such as local ordinances, planning documents, corridor planning guidelines, websites, and letters from citizens.

WSDOT uses the Visual Quality Criteria Rating Scale and Visual Analysis Matrix to evaluate the existing conditions and the potential effects and benefits of the project. This matrix, developed by WSDOT for conducting visual quality assessments, includes a numeric ranking system to measure visual quality.

Examples of the rating system are shown below.

### **Vividness Rating**



**This view toward Mt. Rainier is exceptionally vivid.**

*Very High* (Rating value = 7): The visual impression received is highly memorable as contrasting landscape elements combine to form distinctive visual patterns. Strongly defined landscapes or landforms are noted, including mountains, large bodies of water, distinctive patterns, colors, and textures of vegetation or significant human-built structures.

*Average* (Rating value = 4): The visual impression received is moderately memorable, with some distinctive patterns; moderately defined landscape or landforms are present, including low rolling hills and smaller water bodies. Vegetation patterns, colors, and textures are less visible. Some significant human-built structures may be present.

*Very Low* (Rating value = 1): The visual impression received is of low memorability. Little visual pattern is formed because landscape elements do not combine to form a striking and distinctive pattern. Homogeneous landforms or landscapes and small bodies of water may be present. Vegetation patterns, colors, and textures are not noticeable and human-built structures are insignificant or not memorable.

## Intactness Ratings



**An intact rural scene.**

*Very High* (Rating value = 7): There is a high visual integrity between the natural and human-built landscape, to the extent that the landscape is free from visual encroachment. Visual integrity occurs where natural areas and human-built landscapes blend into the surrounding character and create no visual discontinuity between the natural and human-built elements. Natural and human-built patterns are not disturbed and they maintain visual order.

*Average* (Rating value = 4): There is an average visual integrity between the natural and human-built landscape. Some visual encroachment onto the landscape is present and it lacks visual order. There is some disruption of the natural and human-built patterns.

*Very Low* (Rating value = 1): There is low visual integrity between the natural and human-built landscape features. Visual encroachment onto the landscape is very apparent. The pattern of elements is disrupted and the integrity of the natural visual order is lost.

## Unity Rating



**A unified rural scene.**

*Very High* (Rating value = 7): The visual elements of the landscape join together to form a highly coherent, harmonious visual pattern. Human-built and natural elements blend together.

*Average* (Rating value = 4): The visual elements of the landscape join to form a moderately coherent, harmonious visual pattern. Human-built elements blend with natural elements, but the visual order is disrupted.

*Very Low* (Rating value = 1): Visual resources do not join to form a coherent, harmonious visual pattern. Human-built elements do not have a visual relationship to natural landforms or land cover patterns and visual order is lacking.

### **Total Visual Quality Ratings:**

The visual quality rating is the sum of the three scores divided by three. Visual quality ratings are based on the following ranges:

5.7 – 7.0 = Very High

4.7 – 5.6 = High

3.7 – 4.6 = Moderately High

2.7 – 3.6 = Average

1.9 – 2.6 = Moderately Low

1.1 – 1.8 = Low

0.0 – 1.0 = Very Low

Views may improve or decline after a project. Change in a view that results in a lower rating than existing is considered a decline in visual quality. Conversely, change in a view that results in a higher rating than existing is considered an improvement in visual quality.

Based on the evaluation of potential effects on visual quality and aesthetics, this report will review the mitigation measures that may be taken to reduce negative impacts to visual quality.

## **What government regulations apply to the views and visual characteristics within the study area?**

A number of federal and state regulations ensure the effects of transportation projects on visual resources and aesthetics are adequately considered. NEPA Section 101(b)(2) states that it is the “continuous responsibility” of the federal government to “use all practicable means” to “assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.” Federal regulations, which address visual quality, include the following:

### **Federal Regulations**

- National Environmental Policy Act (NEPA), 42 USC Section 4231-4335; Section 101(b)(2)
- Section 4(f) of the Department of Transportation Act, 49 USC 303(b)-303(c)
- Highway Beautification Act, 23 USC, 131, 136, and 319 and 23 CFD 750-752
- Wild and Scenic Rivers Act, 16 USC 1271-1287
- Historic Preservation Act, 16 USC 470-1

### **State Regulations**

In addition to federal regulations, several state regulations address visual quality and aesthetics, including those listed below:

- State Environmental Policy Act (SEPA) (Revised Code of Washington 43.21C)
- Washington Administrative Code (WAC) 197-11; WAC 468-12

# Existing Conditions

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## How does WSDOT collect the visual assessment information?

The first step in assessing visual quality is to understand existing conditions. Existing conditions are assessed by visiting the project vicinity and the surrounding area multiple times. During these site visits, existing conditions are documented, such as the user groups, visual resources, and viewsheds. WSDOT also documents and photographs visual resources at selected viewpoints, referred to as observation points, during the site analysis. Subsequent to the site visits, additional background materials such as maps, aerial photographs, and various FAA guidance documents, and pertinent data on the airport improvements are reviewed.

Existing conditions are then evaluated in accordance with the FHWA's *Visual Impact Assessment for Highway Projects* methodology. This includes the following components:

- Identifying the existing regional visual character
- Identifying the affected viewshed
- Determining the visual resources of the project site
- Identifying observation points
- Determining the viewers—those who have a view of and from the project
- Identifying the sensitivity of the viewers
- Describing and evaluating the visual landscape under existing conditions
- Describing and evaluating the differences to the visual landscape as it appears under each alternative



Exhibit 1-1 Methow Valley Airport Beacon Visual Study Area

## What is the study area and how was it determined?

The area studied in a visual quality assessment is the project viewshed. The project viewshed is defined as an area that viewers can see from the project and areas with views toward the project, without regard for the screening effects of vegetation and structures, as if the land were bare. Typically, if viewers can see an area or a feature from the project, a viewer located in that area or near the feature can also see the project. In actuality, land cover such as vegetation, structures, and artificial or natural features, determine what we can and cannot see.

For the purposes of this study, the project area can be defined as a single viewshed. The Methow Valley Airport lies on the valley floor adjacent to the Methow River. On the other side of the river as well as behind the airport, the hills rise rapidly to enclose the valley. The valley runs in a mainly north-south direction. The hillsides to the east and west are steep and the valley floor is relatively narrow. The riparian area around the Methow River is treed and filters some of the light from the airport to similar elevations on the opposite shore. Because the beacon shines upward at an angle between the original factory setting of 5 and the maximum setting of 12 degrees, these trees do not provide screening for residences on the hillsides around the airport. The hillsides are partially treed; however, the majority of the native vegetation is shrub-steppe. Shrub-steppe environments are arid and are made up of shrubs such as bitterbrush, rabbit brush, and greasewood, along with native grasses and low-growing forbs. These plants do not provide a visual buffer for the effects of the airport beacon.

The project area was based largely on feedback received from the general public after the new beacon was turned on, aerial mapping, and on-site reconnaissance completed prior to testing. The project area extends from the Bear Creek Golf Course, approximately 2 miles to the north, to the Riverbend RV Park, approximately 2 miles to the south of the airport. Hillsides to the east were viewed from an elevation of approximately 2,300' and to the west at an elevation of approximately 1,850'. All of the project area lies outside the jurisdictional boundaries of Twisp and Winthrop.

## **Who are the viewers and what stake do they have in visual quality?**

The Methow Valley Airport Beacon Study groups the viewers into two categories: those who travel through the corridor around the airport and those who are neighbors of the airport. Transient users can be described as tourists or commuters. Tourism plays a strong role in the economy of the Methow Valley, and special attention was paid to this group. Neighbors of the Methow Valley Airport include residents, adjacent property users, and adjacent business users who have views of the airport or whose view may be impacted by the airport beacon. These two groups sometimes overlap.

User groups were also evaluated for viewer "sensitivity." The activity that the viewer is involved in, the duration or period of time the view is perceived by the viewer, and the frequency or how often the view is perceived by the viewer affects the sensitivity of the viewer. In general, a person living near the airport

will be more “sensitive” to visual changes than a traveler driving past the airport once, because the resident’s duration or frequency of view will be greater. The identified user groups are described in the following sections.

## **Transient Users**

Transient users can be split into three categories with various degrees of sensitivity. These groups include drivers using SR 20, who are simply passing through the area; commuters, who live in the area or nearby and use the roadway daily or nearly daily; and tourists/recreationalists who are making the Methow Valley and the towns of Twisp and Winthrop (or adjacent lands) a destination. SR 20, the North Cascades Highway, is also a popular scenic drive in its own right and is part of both the Cascade Loop and the North Cascades Scenic Highway. The North Cascades Smokejumper Base is specifically mentioned in the description of activities on the North Cascades Scenic Highway.

Drivers, those viewers who are using SR 20 infrequently, exclusive of those driving SR 20 as a destination/activity, have a moderate sensitivity.

Tourists/Recreationalists may be unused to the area and more likely to be taking in their surroundings, whereas those using the corridor more frequently are more focused on the purpose of the trip rather than the experience. These viewers, while moderately sensitive have low viewing frequency. The beacon is designed to be active from dusk to dawn.

Drivers who are using SR 20 as its own destination can be expected to be very sensitive to the view. Passive motorists, such as vehicular passengers, are also generally more sensitive to views. Motorist recognition increases where changes in the landscape character occur. All individual views from the roadway last a relatively short time due to the movement and speed of the viewer. View duration varies with the season and climatic conditions. Since tourists travel to see the countryside through which they are passing, the sensitivity of this group is high. Recreational driving is typically timed during daylight hours when the beacon is not active.

Commuters who frequently and routinely travel the roadway generally possess moderate visual sensitivity to their surroundings. The passing landscape becomes familiar to these viewers, and they typically focus their attention on the technical aspects of driving, rather than the passing views. At standard roadway speeds, views are of short duration and roadway users are fleetingly aware of their surroundings, including traffic, road signs, and other visual features. However, these viewers do notice changes in the visual environment. Therefore, these viewers are generally considered to have moderate visual sensitivity. Viewers with this level of sensitivity can be

anticipated to become more sensitive during winter driving conditions during darkness when the effects of the beacon become more noticeable. However, SR 20 is at a similar elevation as the airport and is partially screened from the effects of the beacon by riparian vegetation when leaves are on the trees.

Visual sensitivity is generally highest for views seen by tourists and other recreationalists as well as seasonal residents. Like recreational drivers, these groups are actively viewing the landscape. The area around the Methow Valley Airport is used by fisherman, campers, day hikers, bicyclists, and other sports enthusiasts. The towns of Twisp and Winthrop base a significant portion of their economy on tourism.

This area has a number of seasonal residents, who have sought out the area for its scenic beauty as a place to keep a second home. These viewers can be expected to be very sensitive to changes in the viewshed.

## **Neighbors**

### *Residents*

Residences surround the Methow Valley State Airport at various elevations and have various levels of naturally occurring plant screening. Homes located above the airport on the exposed hillsides to the east and west experience the maximum direct effects of the beacon. Other homes located nearby may experience the ambient effects of the beacon and reflected light, as well as impacts to stargazing.

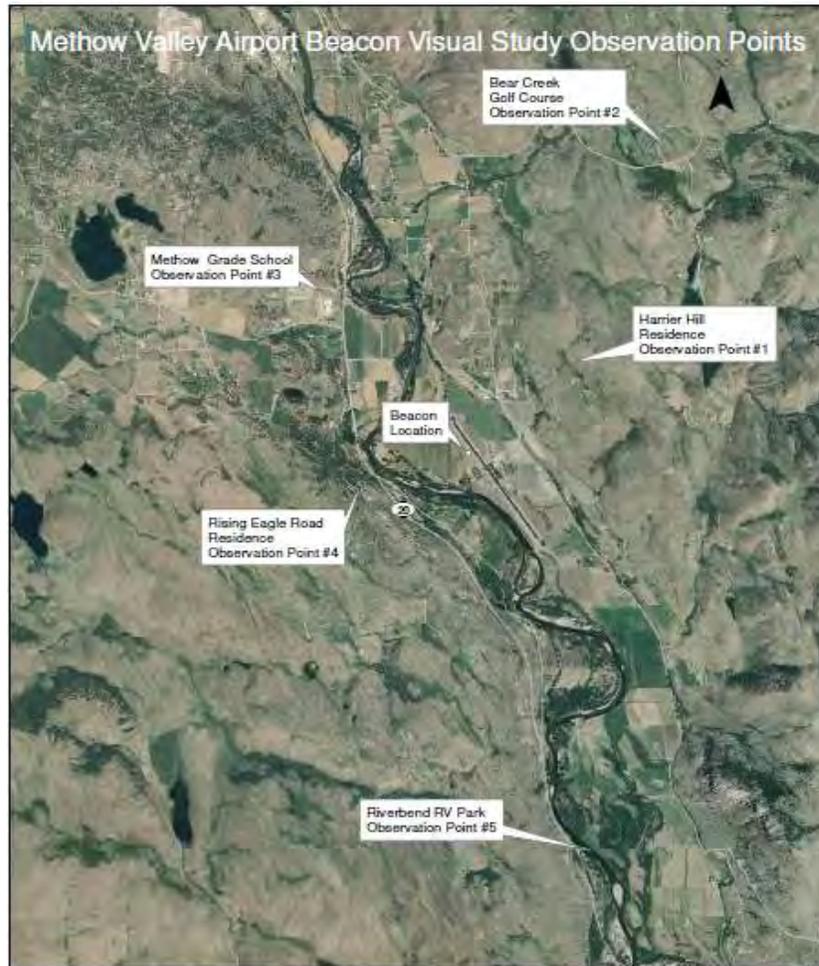
Residential viewers typically have extended viewing periods and are concerned about changes in the views from their homes; these viewers are generally considered to have high visual sensitivity.

Those residents that experience the direct effects of the beacon can be described as the most sensitive viewers. They not only have extended viewing periods and concerns about the changes in the views from their homes, but also have light directly intruding into their homes from the beacon. As this is a rotating beacon, these effects become difficult for the average viewer to acclimatize to, as the effects are intermittent in nature. Several of the directly affected residents have also complained of the impacts to the night sky environment, noting that the beacon makes photographing or observing the sky with a telescope difficult. They report that the transient nature of the beacon causes the eye to be drawn to the light, further negatively impacting their enjoyment of the view from their own property. Several have stated that their sleep was impacted by the beacon, and that their daily lives inside their own homes were impaired by its light.

## *Businesses*

Most of the businesses located around the Methow Valley Airport operate during hours when the beacon is not on, or when the effects of the beacon are the most minimal. The users of the businesses are typically internally focused on their interactions with the businesses and are likely to have low to moderate viewer sensitivity. However, there are some exceptions to this.

The Riverbend RV Park is located within the viewshed as is the Bear Creek Golf Course and the local high school and grade school. All of these businesses can be expected to operate outside of daylight hours to one degree or another, and thus the beacon could have a negative impact upon them. Users of the golf course and the schools may also be internally focused on their own activities. However, the users of the RV Park are likely to fall into the recreational user group and should be considered at least moderately sensitive.



**Exhibit 1-2 Methow Valley Airport Beacon Visual Study Observation Points**

## What is the current visual character of the study area?

Visual character describes how form, line, color, and texture combine to create a sense of dominance, scale, diversity, or continuity within a particular area. Visual character is not a description from a particular view, but rather an overview of the natural and built landscape features and their relationships that together lend a distinct character to an area.

### Regional Character

The regional landscape establishes a frame of reference for comparing the visual effects of project alternatives and determining the significance of these effects.

### Project Vicinity Character

This analysis includes a portion of the Methow Valley between the towns of Twisp and Winthrop. This area can be described as rural in character. Most of the valley floor has been converted from native vegetation to agricultural or commercial usage. The steep hillsides are lightly populated with large areas of native shrub-steppe vegetation. The Methow River runs alongside the airport and the river has a treed riparian buffer. SR 20 lies across the Methow River from the airport and runs in a northwest-southeast direction. The town of Twisp is located 4 miles to the southeast, and the town of Winthrop is located 3 miles to the northwest.

The airport itself falls into the Okanogan County Airport Development District. This zone permits all aviation-related uses and a variety of non-aviation uses that exclude residential. Okanogan County designates the area outside the airport as Methow Review District, which was established to “protect the sensitive environmental, aesthetic, and economic qualities of the Methow Valley through review and in the imposition of more stringent development and subdivision standards.” Parcel size for residential dwellings is limited to 1 dwelling unit per 5 or 20 acres, depending on the exact location.

### Study Area Roadside Classification

The WSDOT *Roadside Classification Plan* designates roadside character classifications for state roadways and is the policy for management of the roadside. The section of SR 20 that runs the length of the study area is designated as rural. Areas located both immediately north and south of the study area are designated suburban and include the towns of Winthrop on one end and Twisp on the other.

The rural landscape is characterized by intermixed built and natural or naturalized elements. Built elements begin to encroach on the natural environment and human manipulations of the land are evident; however, landforms and vegetation appear natural and vegetation is predominantly native. Non-native vegetation, where it exists, reflects historical land use, such as an orchard next to the roadway or a pasture sown with forage grasses for grazing livestock. Roadsides classified as rural may also contain remnants of the indigenous forested landscape. The rural designation in this corridor refers to a pattern of sparse residential and agricultural development and scattered neighborhood commercial centers in the greater context of a prevailing rural or forested landscape.

## **How were the observation points determined?**

Observation points identify and compare the visual effects of existing conditions to conditions during beacon testing. There were five observation points chosen, which reflect the views of identified viewers. Care was taken to ensure all types of viewers were considered.

Four possible criteria were used in the selection of observation points:

- The view is typical of other similar landscape profiles and is in a public location that has a number of sensitive viewers nearby.
- The view represents moderate to extreme changes in the visual quality or character of scenic views, historic buildings, designated viewpoints, or view corridors and is in a location where there are sensitive viewers.
- The view is what a person walking, biking, driving, or riding will see.
- A substantial portion of the impacted area is visible from the observation point.

## **What is the current visual quality of the study area?**

This visual quality of the Methow Valley is generally high. It is largely a shrub-steppe environment, and native vegetation in the area surrounding the airport is healthy and diverse. Much of the valley floor has been converted to agriculture. Many residents volunteered that they value the night sky in the area, which is naturally dark with little ambient light pollution.

## Observation Points

### *Observation Point 1: Harrier Hill Residence*



**Exhibit 1-3 Observation Point 1: View from the Harrier Hill Residence toward the airport**

This observation point is located on private property. Prior to the visual quality report, the Harrier Hill residents reported to WSDOT-Aviation that they were negatively impacted by the new airport beacon, both by direct effects of the beacon and by the ambient effects. They are located northeast of the airport at an approximate elevation of approximately 2,300'. There are no naturally occurring vegetated buffers between the airport and the Harrier Hill residence. The Harrier Hill residence represents the group of viewers thought to be most impacted by the new beacon and the viewer type most sensitive to changes in the viewshed.

The Vividness at the observation point is high. The landform is high in Vividness, the vegetation is an excellent example of a mature shrub-steppe ecosystem, and constructed elements are average. No water is visible in this view. Observation Point 1 received a high rating for Intactness. The level of development is limited and has few visual encroachments or eyesores within the view. This is a unified rural landscape. The total visual quality rating based on these three categories is 6, a high score.

### *Observation Point 2: Bear Mountain Golf Course*



**Exhibit 1-4 Observation Point 2: View from Bear Mountain Golf Course toward the airport**

Observation Point 2 is located in a parking area associated with the Bear Mountain Golf Course. This location is also northeast of the Methow Valley Airport. Elevation at this location is approximately 2,000'. A natural visual buffer exists between Observation Point 2 and the airport. The hillside to the south also partially blocks the direct effects of the beacon. This observation point was chosen to evaluate the ambient effects of the beacon and to represent both neighboring businesses and recreational users, both of whom can be expected to be moderately to highly sensitive.

This observation point was rated high for Vividness due to its striking rolling topography and variety of native vegetation. Observation Point 2 is an intact rural landscape with a lack of encroaching development. It has a very high rating for its Unity with the surrounding landforms and land cover. The overall visual quality rating for this viewpoint is 6, a high score.

### *Observation Point 3: Methow Valley Grade School*



**Exhibit 1-5 Observation Point 3: View from Methow Grade School toward the airport**

Observation Point 3 is located just south of the Methow Valley Grade School, which is located northwest of the airport and is at approximately 1,750' elevation. This is very nearly the same elevation as the airport. Some vegetative buffer exists between the airport and the grade school. This observation point was chosen to represent views by the general public, which may not otherwise experience impacts from the new beacon. This view also represents a "business" that can be expected to be in operation during nighttime hours when the effects of the beacon become most noticeable. Observation Point 3 is further located just to the west of SR 20 and at a very similar elevation. This observation point can also represent views that the traveling public can be expected to experience.

The view of the hills to the east is striking from this location, and the line they form helps to draw the eye down along the valley floor. Vegetation is robust and ecologically appropriate. Observation Point 3 rated very high for Vividness. Little development is observed from this location and very few encroachments are visible. The location is several feet higher than SR 20, effectively shielding the viewer from this encroachment as well. It is a very intact view with little disturbance seen. Like the other views, the Unity of the area is high. The overall visual quality rating is 5.0, a high rating.

### *Observation Point 4: Rising Eagle Road Residence*



**Exhibit 1-6 Observation Point 4: View from the Rising Eagle Road Residence toward airport**

The Rising Eagle Road residence is located to the west of the airport, almost directly across from the new beacon. Observation Point 1 is visible from this location. Elevation at the Rising Eagle Road residence is at approximately 1,850'. The Methow River is visible from this location. Riparian vegetation is seen along the Methow River. Neither this vegetation nor the native shrub-steppe vegetation interrupts views of the beacon and airport from the Rising Eagle Road residence.

The Rising Eagle Road residents, like the Harrier Hill residents, reported being negatively impacted by the beacon. Like the Harrier Hill residents, they experienced light from the beacon shining into their homes and keeping them awake at night. They also complained of the ambient light impacting their night sky views. Like the Harrier Hill residence, this observation point represents the group of viewers thought to be most impacted by the new beacon, with the viewer type most sensitive to changes in the viewshed.

Observation Point 4 is the first point from which the Methow River is seen. The riparian vegetation along its banks is striking, as are the hills behind the airport. Vividness is rated very high.

The view scored lower for Intactness, as the airport and businesses visible in the middle ground represent the most urbanized portion of the study area. Intactness and Unity are rated moderately high. The overall visual quality rating is high for this viewpoint, scoring a 6.

*Observation Point 5: Riverbend RV Park*



**Exhibit 1-7 Observation Point 5: View from Riverbend RV Park toward the airport**

Observation Point 5 was chosen to represent a view likely to be experienced by a recreational viewer. This point is located just to the north of the Riverbend RV Park and southwest of the airport. This location is at a lower elevation than the airport, at approximately 1600'. The airport facilities are not directly visible from this location.

This view had the highest rating for Vividness due to the striking landscape and robust native vegetation, and the beauty of the Methow River. No development is visible from this location, nor are any encroachments, giving this viewpoint a very high rating for Intactness and Unity. The overall rating for this viewpoint is 7. This view rated the highest of all the observation points and represents the most natural state of the valley floor.

# Potential Effects

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This section describes the changes to views and visual quality for each alternative and compares them to the existing night sky conditions from the observation points described in the previous section.

The effects for each alternative are described below in narrative form. The visual analysis matrix summarizes the visual quality ratings, so you can easily compare the changes in the visual quality ratings from the observation point for each alternative. The change in total visual quality for each view is considered to be the positive or negative visual impact. Views may improve or decline after a project. A total visual quality rating change of 1.0 or greater is considered to be a significant visual impact for the purposes of this report.

## How was the testing conducted?

Prior to testing mitigation for the new beacon, WSDOT personnel visited the area around the airport. Staff reviewed possible locations for observation points to fairly represent all viewer types identified. WSDOT-Aviation had compiled a map showing the location of residents who had reported negative impacts. Additionally, two residents, when contacted by WSDOT-Aviation, offered their private property as a viewpoint. A third resident offered their property as well; however, a site visit determined that the natural vegetation in front of their home made photography of the beacon problematic. This residence was located to the north of the Rising Eagle Road property and at a slightly lower elevation. It was felt that the Rising Eagle Road property would not only photograph better but would more accurately represent impacts at both locations. Observation points were limited to five in order to allow WSDOT staff time to move from one to the other between the hours set for testing. Testing hours were set to begin at 6:30 p.m., when it would be dark and residents would likely have returned from work, and run to 8:00 p.m. After the first night, testing was extended to 8:30 p.m. to accommodate travel between observation points. Testing was not extended past 8:30 p.m., as it was conducted during the week and WSDOT did not wish to unduly impose on residents' privacy.

Three other sites were chosen in addition to the private residences. These locations were chosen to represent other viewer types and to surround the airport on all sides to accurately capture the effects of the beacon on the valley. These other sites are the Bear Creek Golf Course, located to the northeast of the airport, the Methow Grade School, located to the northwest of the airport, and the Riverbend RV Park, located to the southwest of the airport. All of the sites chosen are located at different elevations in an attempt to further capture the effects of the beacon.

Once the observation points were selected, the testing team visited them and determined where best to place the cameras. These locations were staked so that the cameras could be set up in the same location each night of testing.

Prior to the first night of testing, WSDOT-Aviation changed the angle of the beacon to 8 degrees from the factory setting of 5 degrees. Testing for the 8-degree angle was conducted that same night, November 5. No other angle was tested on that night, nor was shielding applied. The following day, November 6, the angle of the beacon was changed to 10 degrees, and it was tested the same night. Again, no other angle or shielding was tested. On the final night of testing, the angle of the beacon was changed to 12 degrees. The bottom 1/3 of the beacon was temporarily shielded. This was the only mitigation tested on the evening of November 7.

On October 25, 2012, and October 30, 2012, WSDOT sent news releases regarding the testing to local media as well as sending emails to the Methow community contact list members who had commented on the beacon in the past. WSDOT gave interviews, which resulted in printed articles for the Methow Valley News and an on-air radio interview with KOZI in Lake Chelan. The news releases were also posted on the WSDOT-Aviation website.

During the nights of testing, WSDOT personnel would arrive at Observation Point 1 at approximately 6:00 p.m. and set up the cameras. Cameras were kept at a uniform height on their respective tripods. WSDOT staff recorded climatic conditions, including temperature and cloud cover, and made notes of any other observations. Observations were made prior to turning the beacon on, and again after the beacon was turned off. Prior to the beacon being turned on, photographs were taken from the observation point toward the airport beacon and then 180 degrees from the beacon to capture views of the dark sky. These photographs were also used to compare impacts of the beacon, as accurately as possible, under the same climate conditions.

Atmospheric conditions can greatly impact the effects of lighting. On a clear night, light can travel unimpeded away from the viewer. On an overcast night,

the light is reflected back toward the ground by cloud cover. Nights where a great deal of moisture is in the air, or when there is snow cover, will also reflect the light from the beacon.

At 6:30 p.m., WSDOT staff radioed personnel at the beacon and requested that the beacon be turned on. Photographs were again taken and observations made and recorded. The observer moved around the observation point during testing to replicate the experience of someone living at, or visiting, that site. As soon as the photographer and observer had obtained enough data, staff radioed the airport and requested that the beacon be turned off. They did so in order to minimize lighting impacts to local residents who had already objected to the beacon and to maintain the process of photographing each observation point with the beacon off as well as on. The beacon remained off while WSDOT staff travelled to the next observation point.

It is important to note that WSDOT-Aviation received several complaints from residents that not enough time was given for them to observe the beacon. This same process was repeated at each observation point and the beacon was turned on five separate times between the hours of 6:30 p.m. and 8:30 p.m. The beacon remained on for approximately 15 minutes at each observation point, for a total of about 75 minutes out of a possible 90 minutes. This process was repeated for three nights while WSDOT tested multiple angle settings and shielding of the beacon.

At the end of testing, the public was invited to comment on the effects of the mitigation via the SurveyMonkey™ website, and the survey was made available for download. Paper versions of the survey were printed out and made available at the Twisp library, the community center, and the Methow Valley News office upon request for those without internet connections or who preferred not to use them.

## **How were the photographs and video taken?**

Because pictures were needed at night, WSDOT-Aviation contacted WSDOT's Visual Engineering Resource Group (VERG) to photographically document the visual impacts of the new airport beacon. VERG was asked to use camera settings that most mimic what the human eye sees. VERG chose to use a Canon 5D Mark II for the still camera work and suggested that WSDOT-Aviation make use of its Sony DSR-PD150 DV Camcorder to capture a video of the beacon effects as well. Personnel at VERG cautioned that no camera or setting fully replicates the human experience and that exposure times can amplify or diminish effects that a human observer would see. This report acknowledges

these inherent problems and has attempted to mitigate for them by the use of human observers and input from the impacted public.

The still camera made use of a Canon 50mm f/1.4 USM Autofocus lens. The camera was placed at a previously staked location, at a set height on a tripod. The camera was set at ISO 640 to balance image quality and light-gathering ability. Multiple exposures were then captured facing toward the beacon with the beacon turned off. The beacon was then turned on at the setting being tested and a second set of photographs were taken. The camera was then turned 180 degrees to capture the effects of the beacon on the land behind the observation point. These photographs used the same settings as those taken facing the beacon. An exception to this was at the Riverbend RV Park, where the neighboring house lights were so bright that they obscured the results of the camera when facing away from the airport.

The video camera was set up in the same way and the aperture was fully opened to allow the most amount of light in at shutter speed 1/30 of a second for clarity. The autofocus lens varied from 6 to 72mm when zooming in and out. This camera, too, was rotated 180 degrees after the beacon was turned on.

All camera locations were staked to ensure consistency between testing nights, and GPS was used to document the location prior to each night's photography. Additional information about the camera setting is available in Appendix B as supplied to WSDOT-Aviation by VERG. VERG personnel also included first person impressions of the light impacts observed during testing.

## **Alternative 1: 8-Degree Angle**

Alternative 1 changed the angle of the rotating beacon from the factory setting of 5 degrees to an 8-degree setting.

### ***What were the atmospheric conditions during testing?***

During the first night of testing, the sky was partly cloudy. Temperatures hovered between 48 and 45 degrees. The stars were more visible through the cloud cover in some locations than in others.

*Observation Point 1: Harrier Hill Residence*

The existing view with the beacon turned off was first captured for comparison with the new beacon angle at the same climatic conditions.



**Exhibit 3-1 Observation Point 1: View southwest with beacon turned off**



**Exhibit 3-1 Observation Point 1: View southwest with beacon turned on**

Observations were made after the beacon was turned on. The observer moved around the site to see as many of the effects as possible:

- Light from the beacon at 8 degrees shone into the Harrier Hill residence's bedroom illuminating the walls.
- The front of the home was washed with light and objects in the yard were clearly visible as the beacon passed.
- The hills behind Observation Point 1 were clearly illuminated as the beacon swept across them. There were several homes on the hillside above the Harrier Hill residence, which likely were experiencing the same sort of impacts. Those at a higher elevation may have experienced more negative direct impacts.

The effects of the indirect light were minimal to the naked eye and the unaccustomed observer. They included a visible lightening of the sky and intrusion of sky glow. It should be noted that the homeowner is a professional photographer with a strong interest in nighttime photography. Further, both of the homeowners have spent significant time in areas such as Antarctica and Greenland and can be expected to have a high standard for night sky environments. One of the homeowners was on-site for all nights of testing and indicated that she felt the night sky was significantly impaired.

Unfortunately, the still camera was not able to capture the full effects that were observed. In the photographs above, the only visible difference between having the airport lights on or off is the view of the runway lights and the lighter sky visible behind the hills. The photographer was asked to record his observations as well as take photos, and his comments are included in Appendix B.

The results from the video camera also failed to capture the effects. As this was true throughout testing, the views are rated based upon the observations of the viewer and only make reference to the photographs for ease of comparison.

This viewpoint has a visual quality rating of 6 based on existing conditions. With the beacon on, the vividness rating was unaffected. Landforms, vegetation, and human-built elements were the same as without the beacon. Intactness scores dropped due to the increased sense of development and because of the light encroachment. Unity was also impaired. The airport beacon made the surrounding areas feel more urban in nature than the previous rural feel. The total visual quality of this viewpoint thus drops from 6 to 4 with Alternative 1.

### *Observation Point 2: Bear Mountain Golf Course*

Observation Point 2 is partially shielded from the effects of the beacon by the hills to the east of the airport. The night was very dark and not many houses were located between the golf course and the airport.



**Exhibit 3-3 Observation Point 2: View southwest with beacon turned off**



**Exhibit 3-4 Observation Point 2: View southwest with beacon turned on**

While it is not readily visible in the photographs, the beacon was observable as it rotated in the valley, washing the adjacent hillsides and reflecting off the clouds. This location experienced more cloud cover than other locations. Typically, cloud cover holds in the effects of light pollution and makes the impacts greater. In Exhibit 3-4, more light is reflected off the clouds and the hills are more visible between the observation point and the airport.

Intactness was slightly reduced due to encroachments and increased development, and Unity likewise was lowered slightly. This viewpoint has an overall visual quality rating of 6 based on existing conditions. Alternative 1 dropped the overall visual quality rating to 4.

### *Observation Point 3: Methow Valley Grade School*

The Methow Valley Grade School creates its own light pollution as it illuminates the buildings and the parking areas; however, light is directed down, as seen in Exhibit 3-5. Additionally, the intersection of SR 20 and Twin Lakes Road lies between the school and the airport. This is an illuminated intersection and skies were less overcast at this location and stars were readily visible with and without the beacon on.



**Exhibit 3-5 Observation Point 3: View southeast with beacon turned off**



**Exhibit 3-6 Observation Point 3: View southeast with beacon turned on**

This set of photographs shows the lightening of the night sky as the beacon passes. The sky is lighter in this view than in the view without the beacon on; however, brighter stars were still visible. The beacon is visible within the lighted cone of the street light.

This viewpoint has a visual quality rating of 5 based on the existing conditions. The overall visual quality rating for this viewpoint dropped to 4 with the beacon on.

#### *Observation Point 4: Rising Eagle Road Residence*

Like Observation Point 3, the sky was mostly clear at the Rising Eagle Road location. Stars were visible and the Milky Way was particularly dramatic. The effects of the beacon at the Rising Eagle Road residence were similar to those experienced at Observation Point 1. Observation Point 4 is located across the valley from the Observation Point 1. Because of this, it was possible to observe the effects of the beacon on one residence from the other. Light from the beacon at 8 degrees appeared to shine directly into the Rising Eagle Road home, illuminating the walls of the living room. Standing on the deck in front of the Rising Eagle Road residence, the beacon drew the eye and its sweep across the hills on the other side of the valley was easy to follow.

The hillside behind the Rising Eagle Road residence was also swept with light, as with the Harrier Hill location. Homes located behind the Rising Eagle Road house were likely to have experienced similar impacts. The Rising Eagle Road residence is located almost in line with the airport beacon, and direct effects from all of the airport's lighting were observable at this location.

Indirect effects of the beacon on the night sky were noticeable. Bright stars were observable with the beacon on, while fainter stars disappeared from view. The rotating motion of the light was highly distracting and would negatively impact photography, astronomy, and casual stargazing.



**Exhibit 3-7 Observation Point 4: View northwest with beacon turned off**



**Exhibit 3-8 Observation Point 4: View northwest with beacon turned on**

Light from the beacon clearly illuminated the airport buildings and drew the eye. With the beacon on, the rating was lowered due to a loss in Intactness and Unity. The sense of development was heightened and light from the beacon encroached into the Rising Eagle Road residence. The rural feel of the valley was impacted by the rotating beacon as well. The total visual quality for this viewpoint with the beacon on and set at 8 degrees drops from 6 to 4.

*Observation Point 5: Riverbend RV Park*

This location is immediately west of the RV Park, and WSDOT vehicles were kept on the WSDOT right of way. Light from a neighboring home created so much ambient light that the photography protocol used at other locations was omitted at Observation Point 5. Photographs were only taken toward the airport and not of the hills behind. This location required that the photographs also be taken at a longer exposure as the site was darker overall. Just as at all locations, however, the observer moved around and took this view into account.

This location is shielded from the direct effects of the beacon by a large buffer of riparian vegetation and is located at a lower elevation than the airport. The photographs taken at this location appear black as there is so little light encroachment from any source. This was the most pristine night environment included in the study. Atmospheric conditions at this location were partially overcast and stars were visible between clouds. Before the beacon was turned on, there were very few impacts to the night sky environment at Observation Point 5.



**Exhibit 3-9 Observation Point 5: View northeast with beacon turned off**



**Exhibit 3-10 Observation Point 5: View northeast with beacon turned on**

Direct effects of the beacon were noticeable if the observer was looking for them. In Exhibit 3-10, the impact of the light can be seen as a slightly lighter area in the upper center of the photo.

Indirect impacts were noticeable to the human eye. Some small amount of lightening of the night sky was visible. Casual viewing of the stars was not impacted

The total visual quality for this viewpoint dropped slightly with the beacon on from 7 to 6.6.

## **Alternative 2: 10-Degree Angle**

Alternative 2 changed the angle of the rotating beacon from the 8-degree setting of the first night of testing to 10 degrees. It was hoped that this angle of the beacon would mitigate the direct effects of the beacon shining into the residences on the hillsides surrounding the airport.

### ***What were the atmospheric conditions during testing?***

It was overcast on the second night of testing and rained for most of the testing period. Temperatures were between 49 and 46 degrees. The amount of water in the air, coupled with the cloud cover, greatly increased the effects of the beacon. This was felt to be a lucky occurrence during testing, as this is a typical weather pattern experienced in the Methow Valley during the fall. Effects of the beacon under overcast skies with snow cover would likely have been even more pronounced.

### *Observation Point 1: Harrier Hill Residence*

Light from the beacon at 10 degrees still struck the Harrier Hill residence and shone into the bedroom windows. While direct effects of the beacon showed no change from the first night of testing, ambient effects were much more noticeable. Light from the beacon was reflected back toward the earth from the cloud cover, and the water droplets reflected light as well. The airport was more visible overall during this night of testing.



**Exhibit 3-11 Observation Point 1: View with beacon turned off**



**Exhibit 3-12 Observation Point 1: View with beacon turned on**

The camera's exposure setting produced streaking of light, which is visible in the photographs. The airport was more intrusive with the beacon on, and with the beacon unshielded, light spilled onto the hard surface beneath the beacon and was further scattered. As before, the Vividness rating was unaffected by the beacon. Intactness scores dropped slightly more than before due to the increased sense of development and because of the light encroachment. The Unity score was lowered, as it had been on the previous night of testing. The total visual quality of this viewpoint dropped from 6 to 3.8 with Alternative 2. It was difficult to see any difference between the 8-degree and 10-degree-angle settings. It appeared to the observer that the differences in light intrusion were due to the effects of cloud cover and moisture in the air.

### *Observation Point 2: Bear Mountain Golf Course*

No difference was observed in the direct effects of the beacon due to the angle change. Cloud cover made the beacon more visible, but minimal in effect. Photography was unable to capture what the human eye was able to see: the increase in sky glow



**Exhibit 3-13** Observation Point 2: View with beacon turned off



**Exhibit 3-14 Observation Point 2: View with beacon turned on**

Visual quality at this location was reduced to 4 from 6 due to encroachment and development impacts to the Intactness score and the loss of Unity. While the photographs don't show the heightened effects of the beacon, the human eye could discern that there was more impact to the night sky with the beacon on.

*Observation Point 3: Methow Valley Grade School*

The rain had mostly stopped by the time the testing crew reached this observation point. Significant moisture was still in the air and heightening the effects of the beacon. The cloud cover was beginning to break up and stars were visible in some parts of the night sky.



**Exhibit 3-15 Observation Point 3: View with beacon turned off**



**Exhibit 3-16 Observation Point 3: View with beacon turned on**

Photography from Observation Point 3 clearly shows increased light with the beacon on and the effects of the moisture in the air and cloud cover on the ambient effects of the beacon. Direct effects were not visibly changed from the 8-degree angle. The beacon is still visible within the cone of light from the street light in the center of Exhibit 3-16.

The overall visual quality rating for this viewpoint dropped to 3.5 on the second night of testing with the beacon on, from an original 5.0, and down from the 4 on the first night of testing.

*Observation Point 4: Rising Eagle Road Residence*

There were no appreciable differences observed between the 8- and 10-degree settings of the beacon at the Rising Eagle Road residence. Light from the beacon still penetrated the home and shone into the homeowners' bedroom. The cloud cover had lessened somewhat by the time the testing team reached Observation Point 4. The Big Dipper was clear in the sky to the north. There was still enough moisture in the air to amplify the light from the beacon, increasing the indirect effects of the light and both the sense of development and encroachment. The increased moisture also amplified the reflective nature of the hardscape, reflecting more of the light from the beacon and from other airport facilities back into the sky.



**Exhibit 3-17 Observation Point 4: View with beacon turned off**



**Exhibit 3-18 Observation Point 4: View with beacon turned on**

The total visual quality for this viewpoint with the beacon on lost points for Intactness beyond that experienced in the previous night's testing. This view rated a 3.9, down from 6 with the beacon off.

*Observation Point 5: Riverbend RV Park*

Like the rest of the observation points, no difference was observed between the 10-degree and 8-degree-angle settings. The camera was unable to capture any effects from the beacon at this location. The observer, who was free to move about during testing, was able to observe the sweep of the beacon clearly visible under the cloud cover to the west of the camera site, increasing the sense of development and decreasing the Unity of the view. Comparing Exhibits 3-19 and 3-20, the sky was lighter while the beacon was operating, though brighter stars can be still be seen in this view. The lighter sky and the sweep of the beacon lowered the score for Intactness and reduced the overall score of the view from 7 to 6 overall.



**Exhibit 3-19** Observation Point 5: View with beacon turned off



Exhibit 3-20 Observation Point 5: View with beacon turned on

## Alternative 3: 12-Degree Angle and Baffling

Alternative 3 changed the angle of the rotating beacon to a 12-degree setting and provided baffling of the lower third of the beacon. This baffling was intended to reduce the amount of light spilling onto the reflective surface of the airport tarmac. Use of a 12-degree angle at the Methow Valley Airport would require a modification of standard from the FAA. This angle change was intended to raise the beacon high enough to remove or reduce the direct impacts to residences on the hillsides around the airport.

### ***What were the atmospheric conditions during testing?***

Skies were very clear on the third night of testing and temperatures ranged from 34 to 30 degrees.

#### *Observation Point 1: Harrier Hill Residence*

Even at a 12-degree angle, light from the beacon entered the Harrier Hill residence and filled the bedroom with light. The hillside behind the residence was swept by the beacon. No reduction in the direct impacts of the beacon was noticed at the Harrier Hill residence. Indirect effects of the beacon were the least noticeable on this night of testing. The observer believes that this was related to the atmospheric conditions rather than attributable to the angle of the beacon. The night sky was clear and there were no clouds to reflect light back toward the ground, and minimal moisture was in the air to diffuse the light.



**Exhibit 3-21 Observation Point 1: View with beacon turned off**



**Exhibit 3-22 Observation Point 1: View with beacon turned on**

The light of the beacon is clearly visible in Exhibit 3-22. Curiously, the camera captured white light streaking on the left-hand side of the photograph, while reducing the red line visible in Exhibit 3-21. The runway lighting was not turned on during this testing. The bottom third of the beacon was baffled and less light is visible reflecting off the hardscape under the beacon. This impacts the sense of development less than a no-baffling option. The overall score for this view remains unchanged, however, from the 8-degree assessment. Total visual quality rated a 4 down from 6 when the beacon is turned off.

### *Observation Point 2: Bear Mountain Golf Course*

The camera was able to capture the night sky, as it is visible from this observation point. This point, which is partially screened by the hillside, experiences minimal direct impacts and few indirect impacts. Indirect impacts all but disappeared at this angle and under these atmospheric conditions. As at the Harrier Hill residence, the observer believes that it was the cloudless night to which the lack of indirect impact should be attributed, rather than to the change in beacon angle.



**Exhibit 3-23 Observation Point 2: View with beacon turned off**



**Exhibit 3-24 Observation Point 2: View with beacon turned on**

Sky glow is still visible from this location, and it can be seen that the silhouetting of the hillsides is more visible with the beacon on. Visual quality scored higher for Intactness and Unity, but with only slight improvements. Overall, the visual score remains the same as with the other nights of testing, scoring a 4, down from an original 6.

*Observation Point 3: Methow Valley Grade School*

The 12-degree setting appeared to produce the least amount of impacts at Observation Point 3. This, too, may have been due to the clear night sky, rather than the angle of the beacon. Impacts were minimal, though the beacon was visible for this location and the night sky was visibly impacted.



**Exhibit 3-25 Observation Point 3: View with beacon turned off**



**Exhibit 3-26 Observation Point 3: View with beacon turned on**

Indirect impacts from the beacon are visible behind the intersection. Casual night sky viewing was slightly impacted, as the faintest stars were no longer observable with the increase in sky glow. Given this location's proximity to the illuminated intersection, it is unlikely that this location would be used for either astronomy or night sky photography. The overall visual quality rating for this viewpoint was 4, down from a pre-beacon score of 5.

*Observation Point 4: Rising Eagle Road Residence*

Indirect effects of the beacon were reduced at this location as well. However, the beacon aligns with the home so directly that even under clear sky conditions, both the direct and indirect effects are still observable. Changing the angle of the beacon to 12 degrees produced no visible mitigation at the Rising Eagle Road residence. The observation team was contacted during testing by a neighbor located on the hillside behind and above the observation point, who reported that light from the beacon was shining into his living room and bedroom. The beacon swept the hillside behind the house and the hillside across the valley, and filled the Rising Eagle Road residence with light. No improvements were noted by either the observer or any member of the testing team.

Baffling of the beacon did appear to make a difference from this observation point. The airport buildings were not as illuminated as on the previous nights, nor was the airport runway.



**Exhibit 3-27 Observation Point 4: View with beacon turned off**



**Exhibit 3-28 Observation Point 4: View with beacon turned on**

The increased sense of development and encroachment was the same at 12 degrees of beacon angle as it was at 8 degrees. The impact to the sense of Unity was partially mitigated by the use of the baffling. Overall, the visual quality score for this view rated a 4, down from a pre-beacon score of 6.

#### *Observation Point 5: Riverbend RV Park*

This view is screened from the direct effects of the beacon by the riparian zone of the Methow River. Under the clear sky conditions experienced on the final night of testing, it was nearly impossible to tell when the beacon had been turned on. The testing crew actually called the crew member at the beacon site and verified that the beacon was on. The observer at the Riverbend RV Park site moved about the entire area and was unable to see the beacon from any angle. Vegetation visible from the observation point was more illuminated with the beacon on.



**Exhibit 3-29 Observation Point 5: View with beacon turned off**



**Exhibit 3-30 Observation Point 5: View with beacon turned on**

The total visual quality score of this view is 6, unchanged from the 10-degree conditions, but down from the pre-beacon score of 7.

# Mitigation

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WSDOT-Aviation recognizes that the homeowners around the Methow Valley Airport have been visually impacted by the operation of the new airport beacon. Four different options were tested as mitigation for the impacts of the beacon. All mitigation options tested had substantial visual impacts when compared to night sky conditions with the beacon off. The effects of these options are summarized below.

## Which method provided the most mitigation?

The effects of the beacon had the least impact at the five observation points on the third night of testing using the 12-degree angle with the baffling.

It is difficult to determine how much the change in angle contributed to this reduction and how much is attributable to the clear night sky on that night of testing. It is possible that, under the same atmospheric conditions, the 10-degree angle would produce the same results. However, a neighbor uphill from the Rising Eagle Road residence was also impacted by light shining into their windows using the 12-degree angle. Additionally, while the 12-degree angle produced the least impact to the views of those tested, there is still a large difference in view quality between the 12-degree angle option and the view without the beacon on.

The baffling option is more readily assessed. Views from Observation Points 1 and 4 were improved by restricting the light from reflecting off the asphalt and concrete surrounding the beacon. This mitigation may also be useful for those residents living closer to the airport or, like Observation Points 1 and 4, directly overlooking the airport. However, the beacon could still be seen sweeping across the higher hills. Views from Observation Points 2, 3, and 5 were unaffected by this mitigation.

Tabulation of results from public feedback supports the conclusion that the 12-degree angle with shielding option produced the greatest amount of mitigation. This did not, however, significantly improve the situation for most residents. The overwhelming comment received on the survey form after testing was to move to pilot activation. It was felt by respondents that this was the only mitigation that could fully address their concerns, while still meeting the safety requirements of airport users.

## What other forms of mitigation can be applied?

The mitigation most requested by viewers of the Methow Valley Airport beacon is to change the beacon to pilot activation. This option is contingent upon approval by the FAA. WSDOT-Aviation will request that the FAA approve this change, since testing of the beacon options for mitigation failed to provide another form of mitigation that was comparable.

Other options of partial mitigation for the light impacts from the airport are available and can be applied. These options are discussed below.

### *Baffling the Beacon*

Regardless of the beacon angle chosen, or if the beacon is placed on pilot activation, testing showed a marked improvement from some observation points with the addition of baffling. While no homes immediately adjacent to the airport were part of the testing group, these homes are located at or slightly above the elevation of the airport and many lack any vegetative buffer. These residences and businesses, like Observation Point 4, may benefit from baffling to reduce the reflective glare of the beacon.

### *Vegetative Buffers*

None of the riparian buffer, which effectively screens Observation Points 3 and 5, as well as other residences and businesses not included in testing, exists on lands owned by WSDOT-Aviation. These buffer areas are extremely important for this and many other uses. WSDOT-Aviation does not have lands available to create additional vegetative buffers, nor is it able to control the protection of the existing buffer. Therefore, vegetative buffers on public lands are not a viable option.

## Recommendations

All beacon angles tested had substantial direct impacts to neighbors and substantial indirect impacts to views of the night sky from properties not directly in the line of sight of the airport. We recommend that the airport beacon be pilot activated to minimize light and glare impacts and to reduce night sky impacts to the few times of the year when the airport is needed at night.

### *Other Lights at the Airport*

Ambient light, which damages the night sky environment, is cumulative in its effects. Under NEPA, cumulative effects of the project, when added to other projects, and past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes those other actions, must be considered. This report additionally recommends the following:

1. Security lights and other lighting on the airport buildings should have night sky-approved lighting techniques applied. These include:
  - a. Fully shielding the lighting to direct the light downward only; showing a preference for those fixtures that do not emit any light above a 90-degree angle.
  - b. Using lower-wattage lights to minimize impacts outside the illuminated radius of the light.
  - c. Using non-white bulbs and avoiding mercury vapor bulbs.
  - d. Shutting off all lights when not in use. Using motion detectors could be an option.

# Appendix A: Feedback From Residents

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Following are the letters and emails that WSDOT-Aviation and Century West Engineering received regarding the Methow Valley Beacon and the testing being done. This appendix also contains some of the responses from WSDOT-Aviation when specific information was requested. All email addresses, names, phone numbers, and physical addresses of residents have been removed. Other than spacing, no other alterations were made to the originals.

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**Sent:** Sunday, November 18, 2012 11:12 AM  
**To:** Johnson, Eric (Aviation)  
**Subject:** Beacon

We very strongly oppose the beacon aspect of your project. This is completely unacceptable to a large number of valley residents. To benefit a very few and seriously degrade the environment for the remainder of us is wrong. We will continue to fight this in every way possible.

Sent from my iPad

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**Sent:** Friday, November 16, 2012 2:25 PM  
**To:** Johnson, Eric (Aviation)  
**Subject:** Methow Valley State Airport Beacon  
Dear Mr. Johnson,

We are writing to voice our concern over a dawn-to-dusk beacon at the Methow Valley State Airport. While we are all for safety and not opposed to a beacon per se, we are very concerned about the impact of a light sweeping across the sky all night, every night.

In the almost ten years we have lived across the river from the airport, I can recall only a few night landings at the airport. Is it really necessary to have a light shining in our community 365 nights a year to enable a handful of night landings that could easily be accommodated by a pilot-activated beacon? The airport is in what is essentially a neighborhood. Are the needs of a few rare night pilots to be put ahead of the needs of those who live in the surrounding neighborhood and will be affected every night?

When we were considering the purchase of our home across the river from the airport, we spent a fair amount of time weighing whether the airport would be an issue in terms of noise and light. We talked with neighbors and others who live nearby. In the end, we determined that there wasn't enough air traffic to significantly affect the peace and quiet that we were seeking, and that the air traffic affects so much of the valley that living near the airport wouldn't be much different than living in many other neighborhoods. The lights, while sometimes visible at night, were generally nonintrusive. The night sky was clear and bright, enabling star and aurora viewing year-round.

With a beacon shining dawn to dusk, this situation will change drastically, not just for us but for all who live in the valley. Like many valley residents, we have large windows in our living spaces and bedrooms that we enjoy day and night. With the beacon, we will need to cover these windows with light-blocking

shades just to sleep. In addition, the bright light creates light pollution that makes it difficult (at best) to see the nighttime sky and the northern lights, from our home and from many other locations. The first night it was on was a great night for aurora viewing, but we saw nothing but flashes of light to the north of us. The airport beacon, not the aurora.

Would we have purchased our home if the beacon had been shining dawn to dusk? Likely not. Does it affect our property value? Most likely, and surely we aren't the only ones. The clear night sky is a significant asset for the Methow Valley, as one of the darkest areas left in the country. This is appreciated not just by residents, but by visitors as well. Let's not destroy this with an unwanted light show.

The test scenario was absurdly limited as a way for residents to adequately evaluate impact. According to those who did manage to see it, the light was on for just a few minutes at a time over the course of several hours. We were never able to verify whether it was on or off, nor did we know clearly what angle was being tested. How can we comment in a survey or otherwise when the testing was so limited? To truly assess impact, we need to have the light on over the course of a number of nights, in different weather situations. If the beacon is truly to be considered, let's give the community a fair chance to evaluate what the impact will be.

Regards,

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We appreciate the opportunity to express our concern about the rotating, dusk-to-dawn beacon at the Winthrop Airport. Dark night skies are one reason that we have a home in the Winthrop area, both for the chance to view unobstructed skies with stars and auroras, and for the health benefits of restful sleep provided by natural dark night skies. We ask that WSDOT explore other reasonable options for lighting the airport for nighttime landings, which we understand are few, such as pilot-operated, short-term lighting and runway lights. And we also ask that the community (both full and part-time residents) potentially affected by the decision be given the opportunity for involvement in the decision process. Thank you for including these comments as part of the public record for the beacon project.

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**Sent:** Thursday, November 15, 2012 1:45 PM

**To:** Wolf, Paul; Johnson, Eric (Aviation);

**Subject:** Methow Airport Beacon

**Re: Airport Beacon**

November, 15 1012

WSDOT PMs.

I am lending my voice to the chorus of concerns over the installation and operation of the "airport beacon". Most, if not all of the concerned residences live in the Methow valley by choice, one born out of a love for nature, solitude and peace. Additionally, there's a price to living in the valley, with a lack of economic opportunities "we" have traded away the financial security found in urban centers for a serene idyllic setting. Correspondingly we are fiercely protective of the environment around us. Speaking as part of the collective, we are a reasonable lot. Before making a decision please come meet with our community – in a Town Hall setting - to work out a solution that is in everyone's best interest.

Kind regards,

**Sent:** Thursday, November 15, 2012 6:33 PM

**To:** Johnson, Eric (Aviation)

**Subject:** Airport Beacon

The 70-member Friends of Bear Creek is dedicated to encouraging the stewardship of the land, the rural scale and pace, and the careful use of water resources in the Pearrygin Lake and Bear Creek Watersheds. We request that you pursue a pilot activated beacon solution vs. a dawn to dusk beacon. Dawn to dusk coverage is unnecessary, intrusive to residents and wildlife, and just plain obnoxious.

We suggest you hold a public meeting and reschedule the testing. The intermittent duration of your previous tests could not have resulted in an accurate picture of how far reaching the beam actually is.

Please reconsider your actions and discuss alternatives with the FAA.

Thank You.

---

**Sent:** Thursday, November 15, 2012 10:03 PM

**To:** 'wolfp@wsdot.wa.gov'

**Subject:** beacon

DOT and the Feds are missing the point with this beacon issue. Technology has changed with radios and GPS navigation used by any sane pilot. There was a time when pioneers in wagon trains marked their route for others by planting sunflower seeds. This is not done anymore. Please respect our night skies in this remote area by using technology to have the beacon pilot activated. It is an oxymoron to attempt to make a beacon shine less! Make the beacon as bright as possible but only when needed, ie pilot activated.

Below is the section on lighting (page 27) from the "Handbook of Suggested Development Guidelines" that is used for the upper Methow Valley.

## LIGHTING

Lighting is done primarily to provide illumination and security. A coordinated system can also serve as an important part of the community's image. Light patterns and types can be varied for the needs of particular situations. The following recommendations are deemed important to the overall image of the planning area.

High intensity outdoor lighting should be used as sparingly as possible and shielding used in cases where lights are necessary. Consider use of other lights with shields and lower watt lights closer to the ground or object to be illuminated. High intensity yard lights that turn on automatically and light up acres of area even when the occupant is absent for long periods are objectionable to many. As the number of installations increase, the many bright lights will give the area an urban appearance and atmosphere that the community hopes to avoid.

Neon and flashing lights should not be used.

Here is a typical Design standard regarding lighting used in developments in the Methow:

### **Decorative Lighting Standards**

Decorative architectural night lighting, e.g., a light post, wall-mounted sconce, or recessed light fixture, is required near or directly on the entrance of each residence in Wilson Ranch. Lighting fixtures must have internal reflectors to minimize the spread of light outside the lighted area.

**Sent:** Monday, November 12, 2012 1:46 PM

**To:** Johnson, Eric (Aviation); [WRogers@CenturyWest.com](mailto:WRogers@CenturyWest.com); Marvel, Nisha; Johnson, Eric (Aviation); Wolf, Paul

**Subject:** airport beacon at Methow valley smokejumper base

Dear WSDOT,

I am writing this letter in response to the installation of the airport beacon at the Methow Valley Smokejumper Base and its recent testing. I live directly across the Methow River and therefore am directly impacted by its use. Earlier this year the beacon was operated a number of nights much to the dismay of valley residents. I personally was awoken by one of the brightest lights I have ever seen flashing across the night sky and directly into my bedroom. The beacon was turned off a few nights later due to significant public outcry. Most recently, the beacon was tested on successive nights at a variety of angles and with different degrees of shielding.

It amazes me that the beacon was turned on in the first place with no public notification given the amount of outcry at the meeting called to address the proposed lengthening of the airport runway. The testing of November 5 thru 7 was flawed at best if informed public comment was the desired result. First, the light was operated from 6:30 to 8:00pm, a time when most people have any number of inside and outside lights on and are involved in activities that divert their attention from impacts. Second, the sequencing of angle changes and shielding was haphazard and intermittent, the light was on, the light was off. Frankly, it was hard to tell what was going on and when exactly was time to look. As I understand it, technicians would change the light, drive to a number of viewing locations, and observe the results. This process, along with inadequate public information beforehand, does not foster meaningful public input. According to the local grapevine, the SEPA prepared for the entire airport project, stated the operation of the proposed beacon would have no significant impacts and would not be different from the light that operated at the airport a number of years ago. The original light was of a much lower intensity and operated only when activated by an incoming plane.

I have lived in Okanogan county since 1975 and the Methow valley since 1990. I, along with my neighbors and fellow valley residents, live here because of the beauty, quiet and rural ambiance. A high intensity airport beacon shining through my bedroom window affecting my sleep, destroying the majesty of the night sky, negatively impacting my property's economic value, and terrorizing the local wildlife, seems completely unnecessary and patently absurd given the use pattern at the airport. Having lived in proximity to the airport for 22 years, I am aware of the negligible amount of nighttime air traffic. Would not a pilot activated beacon make more sense? The beacon, as tested in all of its various configurations, significantly impacts the quality of life here in the valley and should only be allowed to operate on an as needed, non-continuous basis with maximum shielding and the highest angle possible.

Given the lack of planning and public information before testing, an inadequate testing procedure for public comment, significant negative impacts of beacon operation, and the absence of a demonstrated need, a public meeting should be held to gauge community sentiment on this issue. Thank you.

Sincerely,

-----Original Message-----

**Sent:** Monday, November 12, 2012 1:38 PM

**To:** Johnson, Eric (Aviation)

**Subject:** Twisp airport beacon

Dear Eric,

I am writing to continue to communicate my request that the beacon at NCSB be pilot activated rather than constant: dusk to dawn. I completed the survey and there is no amount of angulation/baffling changes that will mitigate the negative impact of a light like that on the Methow sky and the quality of life here- both for people and creatures.

I appreciate the responsiveness you all showed this summer when you actually turned the light off due to public comment. Please keep it off and make it pilot activated.

Thank you,

---

**Sent:** Monday, November 12, 2012 9:13 PM

**To:** Marvel, Nisha; Wolf, Paul; Johnson, Eric (Aviation)

**Cc:** [linda.parlette@leg.wa.gov](mailto:linda.parlette@leg.wa.gov)

**Subject:**

To whom it may concern @ WSDOT:

I am writing regarding the installation of the new beacon at the Methow Valley airport (Smokejumper's Base). I think it is obvious that the citizens of the Methow Valley are overwhelmingly opposed to any beacon operating during all nighttime hours. I know that regulations are sometimes necessary for safety but it is pretty clear that the Smokejumper's Base does not need that kind of operating schedule. There are very few nighttime landings and those could be safely performed with a pilot keyed beacon and landing lights. I live directly across the river from the airport and I will not support and will vigorously oppose nighttime operation of the beacon as proposed. It would be the most egregious form of light pollution in a valley that is traditionally a rural refuge from such intrusion. We love our night sky and sense of isolation and will not allow it to be disturbed by rules and regulations that have no application here.

Sincerely,

**Sent:** Monday, November 12, 2012 2:40 PM

**To:** Wolf, Paul; Marvel, Nisha

**Subject:** Winthrop Airport Beacon

November 12, 2012

Dear Mr Wolf

In regard to the Winthrop Airport beacon, I wish to make a few comments and ask some questions.

This beacon will interfere with sleep, causing much stress and strain on the households located around it. It also destroys the pleasure of the night skies – star gazing, meteor watching and observing the Aurora Borealis. This beacon has taken a rural area and turned it into something that feels like a prison ground with a rotating search light constantly blinking in our windows and lighting up the walls inside our house and the clouds outside as well.

While it was courteous of you to do some testing during the past week, your methodology appears flawed. It seemed that the testing was set up for the convenience of the numerous DOT employees driving around the valley in multiple vehicles. The notice given said the test would run from 6:30 til 8:00 pm when in fact it ran for a few minutes several times between those hours. I asked people if they'd had a chance to see the testing and many said they had not. Additionally, you scheduled it during the election when most people wanted to follow the returns. And in November, most people who have second homes in the Methow are not even here.

It seems that the Washington State Department of Transportation saw an opportunity to get some 'easy money' from the federal government and for some reason, thought that people in this rural valley would not mind having a dusk to dawn rotating light in their houses 365 days of the year. Really? What were you thinking? You have in fact with this beacon, destroyed my quality of life.

- Has the DOT demonstrated a need for the beacon other than the fact that FAA requires it when you spend federal money to improve an airport?
- Did the DOT actually inform the public that they were installing a dusk to dawn rotating beacon that would light up the night sky of the middle Methow Valley in addition to lighting up many households? I can find no record of it.
- Did the DOT do an adequate SEPA for this project? In light of the uproar caused by this beacon, is the DOT going to start over and do an EIS? What is the cost of an EIS – approximately?
- How much federal money did the DOT take?
- Has the DOT considered returning the money to the federal government?
- Has the DOT considered the impacts to wildlife, including migrating birds and bats?

I think that everyone around the airport is in favor of pilot safety and no one has argued that the pilot-activated runway lights are a bother. Perhaps it is time for you to make the beacon also pilot-activated.

Sincerely

**Sent:** Thursday, November 15, 2012 12:42 AM

**To:** Wolf, Paul

**Subject:** Methow Valley Beacon

Hello, I am writing as a homeowner in the Methow Valley. The use of a all night beacon on an airport that gets zero night flights is just beyond reason. In fact there is not one flight a week in the day for most of the year, much less at night. The situation of the airport being at the center part of the valley makes it uniquely qualified to ruin the night sky from top to bottom. From our families house when the light is turned on, it feels like a prisoner of war camp with a beam lighting us up ever few seconds.

Is there any documentation of night flights to this airport? Keep in mind that it is only busy with flights in the summer, when the night does not come till 10 PM. We all have to live here all winter when the night lasts forever, with a beacon in our eyes-----and NEVER a night flight on the way!

Thank you for your attention on this issue.

---

**From:** Wolf, Paul

**Sent:** Thursday, November 15, 2012 8:37 AM

**Subject:** Airport light

Dear

Thank you for your comments regarding the Methow Valley State Airport Beacon issue. Your comments will become part of the public record and I will forward them on for inclusion into the visual analysis currently being conducted. WSDOT Aviation will provide answers to your questions via the analysis report.

Sincerely,

Paul Wolf  
WSDOT Aviaiton Division  
State Airports Manager

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WSDOT

Please consider my letter concerning the rotating light at the Smoke-jumper Base. I live on Old Twisp Highway almost directly across the river from the airport and have been a resident there for nearly forty years. I appreciate the need for the Jumper Base and as an EMT, I have helped load many patients on planes and helicopters to send them to distant hospitals. The light in the past has been an infrequent annoyance that we endured because it was supposedly needed. I question the need for the bigger better replacement. Pilot friends have said that to activate the old light you only needed to click your radio microphone on a particular frequency and the light came on. Why the need for the new light in this age of modern electronics? The new light can surely be seen from space and a modern GPS unit should be all that's required to find the airport. An upgrade of facilities shouldn't always mean bigger and more annoying. Do what is necessary but remember that people live near the airport and don't want their world disrupted with unnecessary gadgets in the name of progress. Keep the Methow Valley a friendly place to live.

**Sent:** Tuesday, November 13, 2012 9:15 PM

**To:** Wolf, Paul

**Subject:** Winthrop Airport Beacon

Dear Paul, I agree wholeheartedly with those many folks who vehemently oppose the light pollution caused by the airport Beacon. I say NO to this intrusion anecdotes degradation to the quality of life here in our cherished Methow Valley. Please remover this eyesore for good. Thank you.

---

**Sent:** Monday, November 12, 2012 1:12 PM

**To:** Marvel, Nisha

**Cc:** Wolf, Paul; Turner, Jacqueline; Salisbury, Sandy; Hodgman, Robert; Ken Bevis; Alan and Marcia Ringgold; [maria\\_cantwell@cantwell.senate.gov](mailto:maria_cantwell@cantwell.senate.gov)

**Subject:** Re: Airport beacon testing to address community concerns

I appreciate the difficult spot WSDOT is in trying to backtrack and analyze the impacts of the beacon. It doesn't change the fact that this was not part of the original SEPA process. Had it been, WSDOT would have received similar comment when the beacon was turned on, and could probably have avoided this outrage. In addition to the procedural issue of evaluating the beacon, we don't need it because:

1. There are no night landings in the Methow Valley in the winter, and few in the summer. Other regional airports with beacons (Cle Elum, Chelan, Omak) suffice for an emergency landing, if necessary.
2. The community did not ask for these upgrades, nor did the smokejumpers. We would have asked WSDOT to turn away the federal funds had adequate analysis been conducted.
3. The technology is outdated. The community already offered a compromise - hook it to the pilot activated lights. If that can't be done, it makes no sense to have a rotating beacon from dusk to dawn (14 hours in the winter!) with today's technology in planes.
4. The FAA circular sighted by WSDOT appears to allow remote control activation of a beacon. Section 8.6.3 of circular 150/5345-56B suggests that "the beacon may be connected via a radio, fiber optic, telephone line or photocell." Therefore, WSDOT just needs to tell FAA that is what will happen.

Please keep it off.

Good luck,

---

**Sent:** Thursday, November 15, 2012 6:51 AM

**To:** Wolf, Paul

**Subject:** LIGHT

Why are you doing this to a place like the Methow Valley. We do so much to preserve the night sky and something so not needed comes along and puts everyone in a angry mood. Please keep the light on the airport out.

**Sent:** Sunday, November 11, 2012 7:39 PM  
**To:** Wolf, Paul  
**Subject:** Winthrop Wa. airport beacon

Dear Mr. Wolf,

I am writing to express my concerns about the beacon at the Winthrop Airport. I have lived in the Methow Valley for over 20 years and it is considered to be one of the premiere areas for viewing the night skies. The beacon will have a negative impact on this viewing as well as the surrounding households, who will constantly be seeing it every night. Also, the public was not informed of the potential effects of the beacon, prior to going forward with the project.

It has been documented that there are very few planes that land at night at the airport. Therefore a beacon is not needed. I am in favor of a pilot activated beacon for the airport. This would satisfy both parties.

Please add my comments to the community's feedback. Thank you.

Sincerely,

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**Sent:** Sunday, November 11, 2012 5:36 PM  
**To:** [WRogers@CenturyWest.com](mailto:WRogers@CenturyWest.com)  
**Cc:** Wolf, Paul  
**Subject:** methow valley beacon

the following is a letter sent to you recently concerning the beacon at the methow valley airport in north central washington. since i could not possible write anything more to the point than this, i am sending it along to let you know that i agree 100% with the opinions stated herein.

thanks for your consideration.

Dear WSDOT,

I am writing in regards to the beacon which has been installed at the Methow Valley State Airport (Smokejumper Base). With all due respect I must tell you the beacon is intolerable. It creates horrible light pollution worse than I've ever experienced in any city. The old beacon came on only when a plane was landing at night, was significantly less bright, and stayed on for about 1/2 hour. It was unpleasant and annoying but one could live with it. I must emphasize that there is no comparison between the old beacon and the new beacon. The new beacon is HORRIFIC! At most it should only be used right when a plane is landing and then it should be shielded as much as possible and aimed at the highest angle for the shortest duration possible.

I would also like to point out the inadequacy of the so-called test period and opportunity for public comment. The test times were inconsistent in that the beacon was tuned off and on at sporadic intervals so that a person might turn off their house lights during the test period and sit in their home and think that the beacon was not even noticeable when in actuality the beacon wasn't even on. I had this happen to me. On the first test night I turned my house lights off, lay down in my bed, and thought all was fine; then the beacon came on and I was absolutely shocked at the intensity of the flashing light in

my eyes. As stated above it was HORRIFIC. There is no way I would be able to sleep with a light of this magnitude on. In fact I was not able to go to sleep for several hours after the beacon was turned off.

Even beyond the fact that those of us who live in the neighborhood would not be able to sleep with the beacon it totally changes this rural valley. Many of us live here because we have made a conscious decision to live in an environment without excessive night light pollution. We have chosen to live in an environment where we can view the night sky and stars. The beacon significantly lowers the value of our homes. Is the WSDOT planning on compensating us for the destruction of our property values (not to mention the destruction in quality of life)?

If public meetings were held to address public concerns on the beacon issue as they should be the public outcry would dwarf the negative response which the WSDOT received when they held meetings a few years ago to address the idea of lengthening the runway.

I strongly urge you to consider this issue seriously. The use of the beacon as currently proposed makes my home uninhabitable.

Respectfully yours,

---

**Sent:** Sunday, November 11, 2012 4:27 PM

**To:** Wolf, Paul

**Subject:** Winthrop Airport Beacon

Paul Wolf, WSDOT state airport manager

Mr. Wolf,

As residents of the town of Winthrop living in the flight pattern of the Winthrop Airport we are sending this formal comment on the planned Winthrop Airport Beacon.

As a strong supporter of the idea of "livability" in our area we adamantly opposed to the "Dawn to Dusk Beacon." The citizens of this community have continually supported any measure that keeps the rural ambience of the Methow Valley. We have worked with Okanogan County and the towns of Winthrop and Twisp, through thoughtful planning regulations, to minimize lighting on commercial buildings and streets as well as dawn to dusk lights in rural areas. These regulations have been very successful in reducing the impact of light glare to valley neighbors. As you may have noticed, we have spectacular night skies. The idea of these skies being destroyed by a very unnecessary rotating beacon is beyond belief, let alone the impact of living where this light flashes into your home every evening! Recent medical studies have proven that over-lighted communities and homes cause stress and sleeplessness.

We have lived here for the last twenty years and have flown into this airport many times. Only on one occasion did we come in near sun down and our pilot was very comfortable landing with pilot controlled runway lights. Being in the flight pattern we have rarely seen private planes landing after dark. On occasion a smoke jumper plane will come

in late. We support having the Beacon being pilot activated when necessary but never a continuing rotating beacon.

Respectfully,

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**Sent:** Wednesday, November 14, 2012 2:31 PM  
**To:** Johnson, Eric (Aviation)  
**Subject:** Methow Valley airport

Dear Sir:

I am writing to register my unequivocal opposition to the permanent airport beacon at the Methow Valley airport. Anyone who lives here knows that this is an airport with very little night traffic. Since the existing lighting has been adequate in the past for those rare occasions when the airport must be accessed at night, there is absolutely no reason to pollute our beautiful night skies with a permanent beacon.

Have you ever been here in the Methow Valley to see our skies at night? Have you ever slept outside at night here? Can you name the constellations, and do you know their nightly and seasonal movements? Do you know the cycles of the moon, and can you identify the shape of the crescent moon as it is waxing or waning? Do you know the date of our next meteor shower? Can you identify the planets and their seasonal changes? Have you ever seen the northern lights here? Have you seen the northern lights and a meteor shower at the same time? It is a truly awesome experience, and something never to be forgotten. You should come here sometime and spend an entire night outside, looking at the sky.

A permanent airport beacon is an outrageous affront to one of our most beloved and cherished environmental assets--our night skies. Night skies are free to everyone, and the beauty of the night skies is enjoyed by locals and visitors alike. Very few communities are able to enjoy and learn from dark night skies; we are so very fortunate here in the Methow.

Furthermore, I am completely appalled to think that this permanent beacon is part of a money-grab for federal dollars. Improvements are one thing when they are made as a result of a real and pressing need. If improvements need to be made to the airport, fine. But a permanent night light is not necessary by any means.

Turn the beacon off. Let incoming pilots activate a beacon when it is needed, as often as it is needed, and ONLY when it is needed.

Sincerely,

---

To whom it may concern @ WSDOT

I am writing regarding the installation of the new beacon at the Methow Valley airport (Smokejumper's Base). I think it is obvious that the citizens of the Methow Valley are overwhelmingly opposed to any beacon operating during all nighttime hours. I know that regulations are sometimes necessary for safety but it is pretty clear that the Smokejumper's Base does not need that kind of operating schedule. There are very few nighttime landings and those could be safely performed with a pilot keyed beacon and landing lights. I live directly across the river from the airport and I will not support and will vigorously oppose nighttime operation of the beacon as proposed. It would be the most egregious form of light pollution in a valley that is traditionally a rural refuge from such intrusion. We love our night sky and sense of isolation and will not allow it to be disturbed by rules and regulations that have no application here.

Sincerely,

---

November 12, 2012

Dear Mr Wolf

In regard to the Winthrop Airport beacon, I wish to make a few comments and ask some questions.

This beacon will interfere with sleep, causing much stress and strain on the households located around it. It also destroys the pleasure of the night skies – star gazing, meteor watching and observing the Aurora Borealis. This beacon has taken a rural area and turned it into something that feels like a prison ground with a rotating search light constantly blinking in our windows and lighting up the walls inside our house and the clouds outside as well.

While it was courteous of you to do some testing during the past week, your methodology appears flawed. It seemed that the testing was set up for the convenience of the numerous DOT employees driving around the valley in multiple vehicles. The notice given said the test would run from 6:30 til 8:00 pm when in fact it ran for a few minutes several times between those hours. I asked people if they'd had a chance to see the testing and many said they had not. Additionally, you scheduled it during the election when most people wanted to follow the returns. And in November, most people who have second homes in the Methow are not even here.

It seems that the Washington State Department of Transportation saw an opportunity to get some 'easy money' from the federal government and for some reason, thought that people in this rural valley would not mind having a dusk to dawn rotating light in their houses 365 days of the year. Really? What were you thinking? You have in fact with this beacon, destroyed my quality of life.

- Has the DOT demonstrated a need for the beacon other than the fact that FAA requires it when you spend federal money to improve an airport?
- Did the DOT actually inform the public that they were installing a dusk to dawn rotating beacon that would light up the night sky of the middle Methow Valley in addition to lighting up many households? I can find no record of it.

- Did the DOT do an adequate SEPA for this project? In light of the uproar caused by this beacon, is the DOT going to start over and do an EIS? What is the cost of an EIS – approximately?
- How much federal money did the DOT take?
- Has the DOT considered returning the money to the federal government?
- Has the DOT considered the impacts to wildlife, including migrating birds and bats?

I think that everyone around the airport is in favor of pilot safety and no one has argued that the pilot-activated runway lights are a bother. Perhaps it is time for you to make the beacon also pilot-activated.

Sincerely

---

**Sent:** Friday, November 09, 2012 5:27 AM

**To:** Wolf, Paul

**Subject:** Beacon at Methow Airport

Good Morning.

We have recently purchased property on Rising Eagle Road just above the Methow Airport, and we are contemplating with great misgivings your proposals for a safety beacon. We would like to weigh in on your project and offer you some thoughts to consider.

The Methow Valley is one of those remaining idyllic spaces where people can live an active and healthy outdoor life, free of urban congestion, surrounded by natural beauty, simplicity, and only those intrusions that they find crucial to a safe, healthy and meaningful life. Your beacon, no matter at what angle you place it or how you shield it, is an unwanted and unneeded intrusion on this beauty, severely infringing on the stupendous Methow Valley night sky. We assume you have had the opportunity to view the Methow skies on clear nights and to be awed by their natural beauty. Having that beauty ruined by a bright light shining from the airport is unthinkable.

We recognize that this small airport is an important aviation presence in the area, serving as the center for fire fighting activities and as an emergency site for us and our area. We also can see the need to allow the airport to be an ever-present available landing site for aircraft with issues. However it is clear that the airport is not, and was not meant to be, a permanent aviation facility. To us, that means that there is no safety-related need to have a permanent beacon situated on the airport site. One that could be put into service for use in times of need would certainly suffice. The technology obviously exists for pilots to activate beacons remotely when they have a reasonable need for them. We would certainly not object to a beacon in times of emergency. We would not be in favor of a pilot-activated beacon if it could be used for recreational pilots to use the airport at night for their pleasure or convenience. Emergencies would certainly be acceptable.

There's no need for a permanent beacon at this airport. It would be an extremely intrusive and destructive presence in our night skies, ruining one of the truly important reasons we all bought here and enjoy living here. We urge you to forget this disastrous venture and to consider something more intelligent, more efficient and more nature and neighbor friendly.

Thank you very much.

---

Dear Nisha,

We wanted to be sure all is told about the testing done on the airport beacon. My wife and I built our home 12 years ago in this valley for a reason. The valley is a "one of a kind" location. The dark sky's at night are a spectacle to see.

One of the testing areas was completed from our neighbor's home just below ours on the west side of the valley above the airport. All three nights we were watching to see of any change. There were none noticed. The beacon light lights up our livingroom and bedroom ceiling like someone is outside with a flash light going off every two seconds. Our front deck faces the valley and we can no longer sit outside and view the beautiful dark night sky's.

We were told this beacon is a requirement of the FAA. Who decided without any property owners input this was necessary? This beacon must not be started in its current configuration. We witnessed a neighbor who is shielded by the trees on the south/west side of the beacon. These trees are higher than the 12 degree test. It seems to us there has been no consideration for property owners who choose to live in this beautiful valley. Why does this airport not have pilot activated lights like other airports. As you are aware, night landing do not happen enough for this beacon. We are prepared to make a stand on this issue and visit every property owner in the valley for a voice who can be heard.

---

I would like to comment on the Methow Valley State airport Beacon; Driving by the state airport beacon on Highway 20 I did notice the beacon on Wednesday Nov. 7th. Though it was not as intrusive as I thought, there was no cloud cover, which would enhance the reflection of the beacon light. This would be very intrusive. Also it does seem to be a waste of energy and expense to taxpayers to keep the beacon on and rotating from dusk to dawn every night, when the airport does not support any commercial aviation traffic or even private traffic. This beacon should be pilot controlled along with the airport runway lights to really be cost effective.

Michael Real , Commercial pilot, former air transport pilot and aircraft owner.

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**Sent:** Thursday, November 08, 2012 3:20 PM

**To:** Hodgman, Robert

**Subject:** Methow Airport

Good afternoon Rob Hodgman, Senior Aviation Planner

I appreciate your phone call earlier. I have attached an unsigned copy of the letter you will receive by mail. I will also ask Sharon to forward you a signed copy electronically when we get it scanned. The letter should be consistent with our phone conversation. Please let Sharon know if you have need for the forms listed in the letter.

Thank you again for your prompt attention to this matter.

---

**Sent:** Wednesday, November 07, 2012 9:15 AM

**To:** Marvel, Nisha

**Subject:** methow airport beacon -- copy of permits

Dear Nisha,

How can I obtain copies of the original permit application and environmental checklist associated with the recent Methow Valley airport improvements, including the new beacon?

Best regards,

---

**Hello,**

**Please send me or email me the form for public comment for the beacon light at the Methow Valley Airport. The light will totally stop any form of contentment or relaxation at night for me and my neighbors. It's horrific!**

**Thank you,**

---

An open letter to the WSDOT personnel responsible for airport beacon testing

---

Dear Sirs,

Your testing process makes it practically impossible for local valley residents to assess the impact of your beacon because,

- 1) You haven't told us what test is being done when,
- 2) Your beacon fires off at unpredictable times, and
- 3) Today, you arbitrarily changed the test window.

It is raining this evening, in case you haven't noticed. Do you expect us to stand outside in the rain, waiting to see what will happen next? During most of the test interval, we see nothing but darkness because the beacon operates only sporadically. It's like waiting for the cable guy to show up. You never know when it might happen. I call my neighbors and tell them to look, then it goes off. This is infuriating.

Simply leaving the beacon on during the entire test period, or telling us when it will be on so we can look for it and observe it, would have been not just polite but necessary to maintaining good relations with the community during this difficult period.

Photographs of the beacon are impossible to take with ordinary photographic equipment because the beam moves too rapidly to be caught in the exposure time required by ordinary digital cameras. YOU DID NOT PLAN A PERIOD WHEN THE BEAM WAS STILL SO WE COULD TAKE PHOTOGRAPHS. You are supposed to be the "experts". Did you not think of this??? The way your test program has been constructed, only *you* can make photographs of the event. Frankly, I do not trust you to take photographs representative of the event.

The consequences of this test will affect the lives of everyone within eyesight of the beacon, and their children, and their children's children. I would think you would take more care to do the tests in a clear manner that the public can understand.

Best regards,

---

#### REPORT ON BEACON TESTING DURING THE FIRST NIGHT

(Don, you are welcome to use any or all of this text in whatever manner suits you).

At 6:30pm Nov. 5, testing began. The sky here is partly cloudy. I am observing the test from my home at 150 Signal Hill Rd, on the West side of the Methow River, at an elevation of approximately 2400 feet. We enjoy an unobstructed 180-degree view of the opposite side of the river and the hills behind. The view of the airport itself is blocked by a small foothill in our foreground. The siting of this house was planned intentionally so that the foothill would block all view of the airport lights.

From our location, due to the foothill, we do not see the flash of the beacon itself -- only the wash of light sweeping the sky. How, you may ask, can you see a light penetrating the clear sky? The answer, of course, is the the sky is never clear. There is always some humidity, dust, or smoke that makes rays of light perfectly visible at night. This is how laser light shows work. Try it with a flashlight, the beam at night is clearly visible.

Try it with a 100,000 candela narrow-beam light source like the airport beacon, and the beam becomes dramatically more visible.

When the beam spins, the light cuts a swath through the air. It scours the hills behind the airport. Emotionally, you can feel the beacon washing over your face each time it passes, every two seconds. It looks like a laser light show that never ends.

Late in the testing, the clouds have receded and the sky cleared. That reduces the intensity of the effect here to a slight degree, but the flash of the beam as it diffuses through the sky still remains more intense than the glow of the Milky Way. One cannot look at the heavens in any direction without constantly being reminded of the beacon.

The pulsing light penetrates my windows. It flashes through the skylight above my bed.

I understand that the DOT is testing various changes to the exact angle of light "shielding". In my opinion, no change in the angle of shielding will make any difference. It does not matter precisely how the little shield around the bulb is adjusted. The mere *existence* of the light is the problem. Pouring that many lumens into the sky at night, pulsating madly, destroys the beauty of the night sky.

In a city, competing against millions of other existing lights, perhaps the people there could decide that one more affront to nature is worth the perceived benefits to aviation. Here in the country, where people visit my home every year and comment that they have, "Never seen the Milky Way," the thought of losing our ability to enjoy a clear view of the night sky is too much to bear.

---

Aristides Pappidas, talking about the "foreverness" of what might happen, said this:

People affected by it.....and the 'test' last night revealed scores of homes containing multi-scores of people..... are only one aspect of something human that must be publicly revealed and addressed. It's just not ourselves being affected but also our children, our grandchildren, our descendants and all the peoples who will be living in visual range of the airport's beacon. They who are going to be deprived every night, forever, of looking up into the cosmos and making that most direct connection to what we are and what we are made of..... where we come from. We've got to stop that beacon from being used (unless whatever government controls things like airports in Washington State creates an exception that would allow it to be used only on an emergency, need-to-use basis.

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**Sent:** Monday, November 05, 2012 8:51 PM

**To:** Marvel, Nisha

**Subject:** RE: Methow airport beacon light

Dear Nisha Marvel

I live directly across the river from the airport and the beacon light is so obnoxious that I cannot even begin to express myself in a rationale manner about my reaction to it. **It is intolerable!** I have never experienced such horrible light pollution in my entire life. Never in a visit to a large city have I ever experienced anything that comes anywhere near equaling what I experienced when I turned off my bedroom light shortly after 8 pm tonight. **Again it is intolerable.**

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-----Original Message-----

**Sent:** Friday, November 02, 2012 11:27 PM  
**To:** Wolf, Paul  
**Subject:** Methow Valley airport beacon

I own a home on Signal Hill road, directly above the Methow Valley airport. I am leaving the country on November 4th, and don't return until November 30th so I won't be present during the brief "test" that is proposed for November 5-8 of the beacon, however I very much want my comments to be included in the public comment period. Quite frankly I cannot imagine that the proposed angle alteration is going to solve the outrage that this beacon would bring to the valley. A higher angle may lesson to some degree the impact for residences lower down in elevation, but is likely to only increase the impact on those of us higher up. In addition to the residences directly impacted cloudy skies will likely diffuse the light to impact even more residents. It is unbelievable to me that this beacon is being considered at all. One of the great amenities of the Methow Valley is the peaceful and DARK night sky where the stars are so brilliant. A constantly flashing beacon is totally at odds with this environment. In addition I can't imagine that such a beacon is even remotely "necessary." Because my property is located across from and above the airport, I hear almost every plane that lands or takes off at the airport and I almost never hear landings at night. Even during the day the landings and take offs are infrequent, except during fire season. I am not privy to the statistics of night-time landings and take offs at the airport but they can't be very significant. And yet, even with the paucity of nighttime airport use this horror is being perpetrated on valley. This is quite frankly insane and an enormous insult to the wishes of the public. It is this kind of thing that fuels disgust and distrust of a remote "big" government. I normally support governmental regulations for public health and safety, but there has to be an exception for situations when the normal benefits of a regulation are not likely to be felt and instead a significant burden will be laid at the feet of the public, without expectation of benefit. Please assist us in preventing this beacon from becoming a valley nightmare.

---

**Sent:** Mon 10/29/2012 9:50 PM  
**To:** Johnson, Eric (Aviation); Wolf, Paul  
**Subject:** Winthrop Airport Beacon and upcoming Test Nov 5-7

Dear Mr. Wolf and DOT staff involved w/ the Winthrop Airport Beacon:

On October 1, 2012, I sat on our deck looking north at an incredible display of the Northern Lights. Tall candles of white light stood 20-30 degrees into the dark sky, faint cloudlike waves came and went. It was amazing. Tonight, I looked to the NE and watched the spectacular full moon rise over the ridge. The tree silhouettes appearing in the face were stark and jagged. On many nights we enjoy the milky way sweeping across the night sky.

All of these sights are only slightly diminished by the scattering of background lights in the valley we look out upon. Our view encompasses the Winthrop airport, and the operation of the beacon would significantly diminish these night sky wonders.

The strong response you received when the incredibly bright rotating beacon appeared in the valley bottom, illuminating the ridges and shining brightly in our windows indicates the depth of value placed on the aesthetic of the sky here. I understand you plan to turn the beacon back on, and appreciate the gesture of testing different possible methods to deal w/ the concerns of neighbors. However, I am extremely doubtful that any angle adjustment or partial shielding will significantly diminish the effects of the beacon. Our home would be particularly impacted by operation of the beacon. To this end, I have sent an email invite to the DOT team (Mr. Stiles) studying this situation to use our home as one of their test viewpoints.

The Aviation Safety reasoning for the beacon holds little meaning in this world of GPS and fast communication. The new runway lighting apparently comes on when airplanes key their mike, or somehow signal presence, somewhere in a vicinity radius (?right?). The runway lights come on periodically, and no one lands. I have been watching from our home overlooking the airport closely for night landings since mid July: I have personally witnessed only one night landing since July 14, and that was the smokejumper plane returning just after dark. The likelihood of an airplane with no radio, no GPS, flying lost across remote N. Central Washington, and suddenly finding the Winthrop Airport Beacon is extremely remote, if not impossible. Winthrop has no commercial service of any kind, and recreational use is during the day, mostly on weekends.

In addition to the extremely unlikely nature of the beacon's use as an emergency signal, the beacon is unnecessary as a continuous signal for regular landings, as there are no airplanes landing here at night. No airplanes. Emergency beacons are outdated technology, as virtually all airplanes have radios and could cue the runway lights. The beacon could be hooked into the runway lights and be pilot activated. Simple. Did I mention that there aren't any airplanes landing at night in Winthrop?

Excessive night lighting is thought to disrupt migratory patterns of birds, bats and insects. The Methow is a "dark sky" environment and this continuous bright source would negatively effect these migrating organisms who otherwise encounter natural night. This element of the beacon would be invisible and substantial. It would need to be investigated for environmental impact.

No matter how the beacon might be operated, it will significantly hurt the aesthetics, wildlife and property values of the upper Methow Valley.

Although I appreciate the nature of the upcoming tests, I strongly suspect that upon their completion I will still feel that:

The Winthrop Airport Beacon should be either 1) Pilot activated or 2) turned off.

Sincerely

---

Hi Paul,

Thanks for sending out the press release about the upcoming beacon testing at the Methow Valley State Airport. It has generated some community buzz already.

I just left a message on your voice mail. I'll write my questions here so you can look at them and respond either by email or give me a call and we can talk.

I assume that if you reply in writing, I can quote you as in a conversation.

1. Is the upcoming beacon testing a result of meetings with the FAA? When/Where/and who met to discuss the community's issues with the beacon? What was the result of those meetings?

[WSDOT met with the FAA on August 1, 2012 at FAA office in Renton to discuss solutions to the beacon concerns.](#)

[After meeting with the FAA, WSDOT initiated a Visual Analysis Study to assess the potential for visual impacts and recommend mitigation strategies. The testing is part of that analysis.](#)

2. Was the option of not having a 24-hour lighted beacon discussed?

WSDOT discussed several options with the FAA, including not having a 24-hour lighted beacon. Since it was a federally funded project, WSDOT must comply with FAA grant assurances to operate the beacon from dusk until dawn. However, the visual analysis will assess the potential impacts and offer us mitigation strategies and explore different options. The FAA is working closely with WSDOT on the analysis.

3. Who will be conducting the testing on Nov. 5-7?

WSDOT's North Central Region (NCR) is conducting the visual analysis. They are supported by WSDOT HQ Geometrix Visual Engineering Group (VERG) and Century West Engineering.

4. What exactly is "visual analysis?"

The visual analysis is a study to determine the effects of the beacon's light emission on Methow's community, develop mitigation strategies, test strategies, obtain public input and provide suggested modifications.

5. What are the shielding options?

WSDOT cannot modify the airport beacon outside of manufacturer's specifications; therefore, we are working with our engineers and the beacon manufacturer to obtain authorized "baffles" for our beacon model. The baffle is simply a cover that partially blocks or shields light emitted from the beacon. WSDOT will test the shielding as a potential mitigation measure.

6. Why do you think that adjusting the angle or shielding the beacon will take care of the issues?

The beacon was originally set to the FAA and manufacturer's recommended 5-degree angle, which prompted complaints from airport neighbors. We are testing the beacon at higher angles to determine if this minimizes the light impact on the valley. We will also test shielding options and ask the community for feedback. It is our goal to consider and test options that will help us find reasonable solutions for neighbors, while also allowing us to remain in compliance with regulatory requirements for both the airport and surrounding environment.

7. How do you plan to assess the impacts on residents living above the valley floor?

The visual analysis will follow a scope of work and conduct testing through a series of specified observation points established before the testing occurs. Public feedback will be included.

8. How will you solicit feedback from the community?

Following the testing, WSDOT will solicit comments from Nov. 9 - 16. WSDOT will send notices to residents and provide a comment form on our website. We will also provide forms to those without Internet access.

9. After the testing on Nov. 5-7 will the beacon remain turned off?

Yes, WSDOT will not reactivate the beacon until a determination is made on how to proceed. The visual analysis is scheduled for completion in January 2013.

10. How will the report be distributed? Is a public meeting planned?

WSDOT will make the report available on its website. At this time, we do not have a public meeting scheduled; however, that could change based on the outcome of the analysis.

11. I never really received good stats on the beacon. How tall is the tower? Approximately 30 feet. How many lumens does the beacon emit and at what frequency? As specified in this report: [FAA AC 150/5345-12F](#), for a L801A airport the candelas depend on the rate of the angle:

Beacon Type (Note 1)	Elevation Angle in degrees	Minimum Effective Intensity of Flash in candelas
L-801A &	1 and 2	25,000 (Note 2)
	3 to 7	50,000 (Note 2)
	8 to 10	25,000 (Note 2)

The rate of flashes is 22 to 26 flashes per minute (fpm)

Who is it made by? Halibrite Are similar beacons used at other regional airports? Yes: Twisp Municipal (not federally-funded, pilot controlled), Okanogan Legion, Omak Municipal, Tonasket Municipal, Dorothy Scott - Oroville, Anderson Field – Brewster, Lake Chelan, etc. The NPIAS airports have beacons that operate from dusk until dawn.

Thanks very much for being open about this process. As you know, the community is already sensitive about this issue, and I believe more information will help diffuse some of the excitement.

Thanks for the opportunity!

---

**Sent:** Friday, October 26, 2012 9:22 AM

**To:** Wolf, Paul

**Subject:** MV News questions

Hi Paul,

Thanks for sending out the press release about the upcoming beacon testing at the Methow Valley State Airport. It has generated some community buzz already.

I just left a message on your voice mail. I'll write my questions here so you can look at them and respond either by email or give me a call and we can talk.

I assume that if you reply in writing, I can quote you as in a conversation.

1. Is the upcoming beacon testing a result of meetings with the FAA? When/Where/and who met to discuss the community's issues with the beacon? What was the result of those meetings?
2. Was the option of not having a 24-hour lighted beacon discussed?
3. Who will be conducting the testing on Nov. 5-7?
4. What exactly is "visual analysis?"
5. What are the shielding options?
6. Why do you think that adjusting the angle or shielding the beacon will take care of the issues?
7. How do you plan to assess the impacts on residents living above the valley floor?
8. How will you solicit feedback from the community?
9. After the testing on Nov. 5-7 will the beacon remain turned off?
10. How will the report be distributed? Is a public meeting planned?
11. I never really received good stats on the beacon. How tall is the tower? How many lumens does the beacon emit and at what frequency? Who is it made by? Are similar beacons used at other regional airports?

Thanks very much for being open about this process. As you know, the community is already sensitive about this issue, and I believe more information will help diffuse some of the excitement.

hello Paul,

One concern that your tests should consider is cloud cover. I saw some quite (pardon the language) hellacious reflections off clouds last summer. Quite disturbing. Honestly I feel like the community has been duped by WSDoT and this beacon. It will be interesting to see what occurs and I hope you get some film (I hope we all get some film) of these events to review when you are finished. And take some night photos without the light as well. We live in a nearly pristine night environment. This beacon no matter what angle will effect our valley.

Interesting term "normally required." That would give me some hope there could be no light at all.

This is one thing I love about this valley:

<http://www.flickr.com/photos/coastaleddy/6993647405/>

In my opinion a beacon would have ruined this scene.

regards,

# Appendix B: Photographic Settings Used

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## Methow Valley Airport

November 9, 2012

VERG (Visual Engineering Resource Group) was asked to photographically document the visual impacts of the new airport beacon. Locations and duration of the testing and documentation were determined by WSDOT-Aviation Division. We met at the airport and reviewed nine potential testing locations. A daylight drive-through resulted in stakes set at five locations (separately included with this report) where access was public or where private access had been granted. The five locations were selected based on views of the valley floor or surrounding hillsides, because they were roughly positioned at cardinal points of the compass around the beacon, and ease of access in the 1.5 hours allowed for testing each night.

## Equipment

### Still camera:

- Canon 5D Mark II
- Canon 50mm f/1.4 USM Autofocus Lens
- Manfrotto tripod with Markin ball head

### Video camera:

- Sony DSR-PD150 DV Camcorder (Record to Tape)
- 1-DV Tape Cassette / night of shooting
- Bogen tripod & head

### Misc:

- Flash shoe bubble level
- Hand-held GPS
- Tape measure
- Recording notebook

## Testing Methodology

The Canon 5D Mark II was selected for full frame sensor image quality and ability of full manual control of exposure. The Canon 50mm f/1.4 was selected for its light-gathering ability and because the 50mm most closely captures the focal length of the human eye. The length of exposures required by night photography requires the use of a stable tripod and the Markin ball

head and bubble level facilities leveling the horizon when photographing through a dark camera viewfinder. Hand-held GPS was used to identify the general location of the observation and photography points. The tape measurements ensure the camera is set up at the same height over the stakes each night at each location.

Testing began before dark at location at the Harrier Hill Road residence. It was anticipated that auto focus would not work with the low level of ambient light, and manual focus was set during daylight hours. Photo composition was set-up to roughly center the beacon in the image and show the valley floor, the hillside behind the beacon and enough sky above the horizon to include stars if visible. Measurements were made from the stake top to the center of the lens and GPS coordinates were documented.

The camera was set at ISO 640 to balance image quality and light-gathering ability. Prior to sunset, light meter readings were taken at frequent intervals as the ambient light fell. The ambient light in the valley after sunset resulted in a slight over exposure at f/1.4 at 15 seconds. Bracketing for exposure was established at:

- f/1.4 @ 15"
- f/1.4 @ 8"
- f/1.4 @ 4"
- f/1.4 @ 2"

Each setting results in one half the light as used in the previous setting, starting with f/1.4 @ 15" that was slightly overexposed and ending with f/1.4 @ 2" being underexposed. Ultimately, the 15" exposure was determined to best fit what the photographer felt was being physically seen. Additionally, those 15" still exposures are separately included with this report.

An image was captured facing the beacon at each of the above listed exposure settings while the beacon was off, the beacon was activated and photographed again with the same range of exposures.

The camera was then reversed 180 degrees at selected sites to capture images of the hillside with the same set of exposures, the beacon was turned off and the same range of exposures created. This procedure created a consistent set of photos - with the only variable being the beacon – to make comparisons showing the light effects.

The video camera was set up similar to the still camera in that the aperture was fully opened to allow the most amount of light in (f/1.9), shutter speed at 1/30<sup>th</sup> second for clarity (any slower would cause too much blurriness, rendering the video camera moot), the autofocus lens varied from 6 to 72mm when zooming in and out.

The video camera too captured valley views while looking at the beacon and also hill side views where appropriate.

## Conclusions

### Still / Video Camera:

All still photography is subjective to some degree. No camera exists that is capable of capturing light in exactly the same way as the human eye. Time exposures are essentially “Painting with light”, as the number of seconds of exposure will multiply the effects of light. It is possible to capture photographs when the human eye perceives only darkness. The airport beacon is flashing alternating green and white lights at a frequency (verify this) of  $x$  per minute. A fifteen second exposure will actually capture 7 – 8 flashes of the beacon and “burn in” the light much brighter than would be captured in a shorter daylight exposure that may capture only a single flash of the beacon. Conversely, while the hillsides would be exposed for 15 seconds, the band of beacon light will only be exposed for half that. This will effectively make the beacon much brighter in time exposures directly at the beacon and about half as bright when looking at the hillsides.

While planning this exercise, Intuition suggested that videography would be beneficial in recording these testing scenarios. In retrospect though, using this particular video camera set to record at the lowest possible light level it is capable of did not capture very much beacon light of what was physically being seen by the videographer. Being a tool that captures motion, the shutter speed could not duplicate that of the still camera, thus less could be seen in some of the video product – especially the hill side captures. Much of the available light from the rotating beacon that was being physically viewed could never be recorded. Although the separate video files are included in this report, it is thought by VERG little can be gained from their review.

In final review, it is believed that while conducting the tests, VERG physically viewed the beacon appearing brighter to the human eye than what it appears in the photographs. Also, that a discernible seeping light-cone occurred from the beacon on the hill side, mostly bright at the Harrier Hill residence and Rising Eagle Road residence observation sites, somewhat bright at others, each night of the different angle tests. Some of the beacon light was recorded through the still photography on each night – very little was recorded though videography.

Kurt Stiles  
WSDOT/VERG manager

# Appendix C: Visual Quality Ratings

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Visual quality is described in terms of Vividness, Intactness, and Unity. We evaluate Vividness, Intactness, and Unity independent from each other and assign each a rating from 1 (very low) to 7 (very high), as described below.

We then combine these three separate ratings to evaluate total visual quality using the following equation:

$$\text{Visual Quality} = \text{Vividness} + \text{Intactness} + \text{Unity} / 3$$

The change in total visual quality for each view is considered to be the positive or negative visual impact. Views may improve or decline after a project. A total visual quality rating change of 1.0 or greater is considered to be a significant visual impact for the purposes of this report.

# VISUAL ANALYSIS MATRIX

Methow Valley Airport Beacon

ALTERNATIVE	ORIENTATION TO FACILITY		VIEW DISTANCE			VIEWER POSITION		WVGRESS					INTACTNESS			UNITY	TOTAL VISUAL QUALITY
	Toward	From	FOREGROUND	MIDDLEGROUND	BACKGROUND	NEAR/OP LEVEL	SUPERIOR	LANDFORM	WATERFORM	VEGETATIVE	MANMADE	AVERAGE	DEVELOPMENT	ENVOUCHMENT	AVERAGE	UNITY	
<b>KEY VIEW 1</b>																	
Harrier Hill	BE Degree							7	10	7	5	4	4	4	4	4	
	NE Degree							7	10	7	5	4	4	4	4	4	
	SE Degree							7	10	7	5	4	4	4	4	4	
	SW Degree & Rolling							7	10	7	5	4	4	4	4	4	
<b>KEY VIEW 2</b>																	
Golf Course	BE Degree							7	10	7	5	4	4	4	4	4	
	NE Degree							7	10	7	5	4	4	4	4	4	
	SE Degree							7	10	7	5	4	4	4	4	4	
	SW Degree & Rolling							7	10	7	5	4	4	4	4	4	
<b>KEY VIEW 3</b>																	
Grade School	BE Degree							5	10	5	5	4	4	4	4	4	
	NE Degree							5	10	5	5	4	4	4	4	4	
	SE Degree							5	10	5	5	4	4	4	4	4	
	SW Degree & Rolling							5	10	5	5	4	4	4	4	4	
<b>KEY VIEW 4</b>																	
Rising Eagle Road	BE Degree							7	10	7	5	4	4	4	4	4	
	NE Degree							7	10	7	5	4	4	4	4	4	
	SE Degree							7	10	7	5	4	4	4	4	4	
	SW Degree & Rolling							7	10	7	5	4	4	4	4	4	
<b>KEY VIEW 5</b>																	
RV Park	BE Degree							5	7	7	7	6	5	5	5	5	
	NE Degree							5	7	7	7	6	5	5	5	5	
	SE Degree							5	7	7	7	6	5	5	5	5	
	SW Degree & Rolling							5	7	7	7	6	5	5	5	5	

**Viewness**  
 7 - Very High  
 6 - High  
 5 - Moderately High  
 4 - Average  
 3 - Moderately Low  
 2 - Low  
 1 - Very Low  
 - Non-existent

**Intactness**  
**Development**  
 7 - No development  
 6 - Little development  
 5 - Some development  
 4 - Average level of development  
 3 - Moderately high development  
 2 - High level of development  
 1 - Very high level of development  
**Envelopment (unobscurable eyesores)**  
 7 - None  
 6 - Few  
 5 - Some  
 4 - Average  
 3 - Several  
 2 - Many  
 1 - Very Many

**Unity**  
 7 - Very High  
 6 - High  
 5 - Moderately High  
 4 - Average  
 3 - Moderately Low  
 2 - Low  
 1 - Very Low  
 - Non-existent

Existing  
 Equal to Existing  
 Higher than Existing

**Rater's Total Visual Quality Score Breakdown**  
 7 - Dramatic, Pristine Natural Environment with water, mountains, and mature vegetation or superb examples of built environment in dramatic physical setting  
 6 - Very High  
 5 - High  
 4 - Moderately High  
 3 - Average  
 2 - Moderately Low  
 1 - Low