AUC Rule 007 Consultation Comments

AUC Renewable Energy Generation Inquiry

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1 Introduction

The Alberta Utilities Commission (AUC) is undergoing consultation on Rule 007: *Applications for Power Plants, Substations, Transmission Lines, Industrial System Designations, Hydro Developments and Gas Utility Pipelines.* There are several considerations the AUC have requested industry and stakeholder input and comments on during this consultation; including:

- Methodology for Visual Impact Assessments;
- Appropriate Field of View in Solar Glare Hazard Assessments;
- Setbacks for renewable energy projects from residences;
- Application of enhanced interim requirements for power plant applications;
- Comments on ambiguities or opportunities for increased efficiencies in existing process.

Green Cat Renewables (GCR) are a specialized engineering consultancy, and have been providing technical, regulatory, and engineering consulting support to renewable energy developments for 20 years. GCR have supported over 100 renewable energy developments in Alberta, supporting over 2.5GW of wind development, 8.5GW of solar, and over 100MW of standalone BESS Projects. GCR have represented developers in AUC hearings' acting as technical experts to provide the AUC with the information it needs to understand the impacts of a project. In addition, GCR are the foremost experts in the assessment of visual impacts in the province, with two decades of experience in preparing Visual Impact Assessments in the United Kingdom and Canada; GCR have provided detailed Visual Impact Assessments and acted as an expert witness to detail visual impacts in prior power plant proceedings.

GCR do not own or operate renewable energy projects in Canada; however, the GCR team have a comprehensive understanding of both renewable energy development, and the AUC application process. During the Inquiry into the ongoing economic, orderly and efficient development of electricity generation in Alberta (the Inquiry), GCR supported the Renewable Generators Alliance (RGA), and provided a methodology for completing visual impact assessments for the AUC's consideration.

GCR are well placed to provide insight and context to the AUC during the Rule 007 consultation. As a third-party expert consultant, GCR provide independent and non-biased consideration and opinion based on our experiences supporting developments through the AUC application process.

As a preliminary comment, the AUC application process is intended to be an impartial, unbiased and transparent process, regardless of the applicant, project or technology. Throughout the Inquiry and Rule 007 consultation process, the AUC has specifically requested comments for renewable energy developments setbacks and specific requirements for renewable energy. GCR would note that many of the issues are just as applicable to non-renewable energy sources as they are to renewable sources. It is considered imperative that the AUC ensure its rules are fairly and reasonably applied to all forms of generation, to ensure that both industry and stakeholders can trust that the AUC process can continue to act in an unbiased manner.

2 Visual Impact Assessment Methodology

During the Inquiry, GCR was retained by the Renewable Generators Alliance (RGA) to prepare a recommended methodology for assessing visual impacts, and a recommended methodology for completing a Visual Impact Assessment (VIA).[1] GCR's methodology outlined a procedure for identifying Valued Viewscapes within a defined study area of a proposed power plant, and for assessing the visual impact to these viewscapes using an objective and unbiased methodology (GCR VIA methodology).

On February 28, 2024, the Government of Alberta (GoA) issued a policy direction on the consideration of Visual Impact Assessments (VIAs) within Alberta, which suggested that the AUC and the GoA would identify areas of national and provincial recognition throughout the province The GoA announcement identified a 35km visual assessment zone for wind projects around certain viewscapes, but did not comment on whether the zones were applicable for other power plant technologies. While a draft map of proposed zones was released by the GoA in March 2024, it is understood that this map has since been withdrawn. As such, GCR cannot comment on the information included in the draft map.[2]

The GCR VIA methodology is based on international standards and GCR's expert opinion and experience. GCR maintains that the previously provided methodology remains suitable and appropriate for visual impact assessments, and the following comments are meant to provide an opinion as to how the GCR VIA methodology can be incorporated into Rule 007 to address the GoA direction.

2.1 Visual Assessment Zones

It is understood that the intention of the GoA direction is for the AUC to identify valued viewscapes across Alberta that would trigger the requirement for VIA. It is assumed that the AUC and GoA will provide a map and list of locations identified as valued viewscapes, and that the locations selected by the AUC and GoA will be available for consultation prior to being issued as final.

Whilst the GoA direction appears to target wind development specifically, GCR are aware there remains uncertainty as to how the requirement for VIA will be applied to other technologies and there remains a disconnect between AUC and municipal requirements (see also Section 5.2), GCR suggest that clarity is required here for developers. Notwithstanding, GCR suggest that the use of a 35km visual assessment zone for all technologies is not appropriate, rather, should other technologies besides wind require assessment, the specific radius of the visual assessment zone should be determined based on the height of the proposed project. In the GCR VIA methodology, it was outlined that visual impacts, and respective study areas, were conservatively determined based on the height of the equipment proposed for the proposed projects. As such, each proposed project would have a defined visual assessment zone surrounding the valued viewscapes identified by the AUC.

In the GCR VIA methodology, a conservative study area was considered based on potential area of visibility of a project based on the overall project height. The justification being that visibility of a structure is diminished with distance, based on the overall height and the curvature of the earth. Using the same methodology, GCR have provided a recommendation on visual assessment zone radius in Table 1, based on the height of the proposed equipment.

[1] Exhibit 28501-X0419, Viewscape Impacts, and AUC Module A report
[2] Exhibit 27729-X0249, Process letter – Direction from the Minister

Table 1 – Recommended Project Visual Assessment Zone

Height of Structure (m)	Visual Assessment Zone (km) (Project Radius)
0-5	10
6-7	15
8-15	20
16-25	25
26-40	30
41+	35

Typically, wind turbines are taller than 41m, suggesting that the 35km visual assessment zone radius is applicable for this technology. However, a typical solar project does not have equipment taller than 5m, suggesting that an assessment zone radius of 10km for solar projects is ample.

Of note, the GoA announcement differentiates visual assessment zones and buffer zones, with certain zones establishing no wind projects to be permissible within. GCR suggests that restricting development of a specific technology in this way without any consideration or assessment of the actual impact, which is not necessarily negative, is potentially a misrepresentation for both developers and stakeholders.

The GCR VIA methodology will provide the AUC an understanding of the visual impacts predicted, allowing for the AUC to consider the impacts fairly, on a case-by-case basis.

Should the AUC determine that certain valued viewscapes are of higher sensitivity than others, the AUC can apply a higher level of scrutiny and acceptable limit of impacts to those viewscapes. This process is considered to be more flexible and responsive to specific issues raised and the specific nature of the project before the AUC.

2.2 VIA Process

A detailed methodology has already been provided by GCR and is recommended to be utilized when completing a VIA. In the event a project is located within the visual impact assessment zone this methodology can be implemented for projects. It is recommended that the AUC consider implementing the following process into Rule 007, once the AUC has identified the valued viewscapes in Alberta that trigger a requirement for visual assessment.

GCR's recommended process is depicted in **Figure 1.**

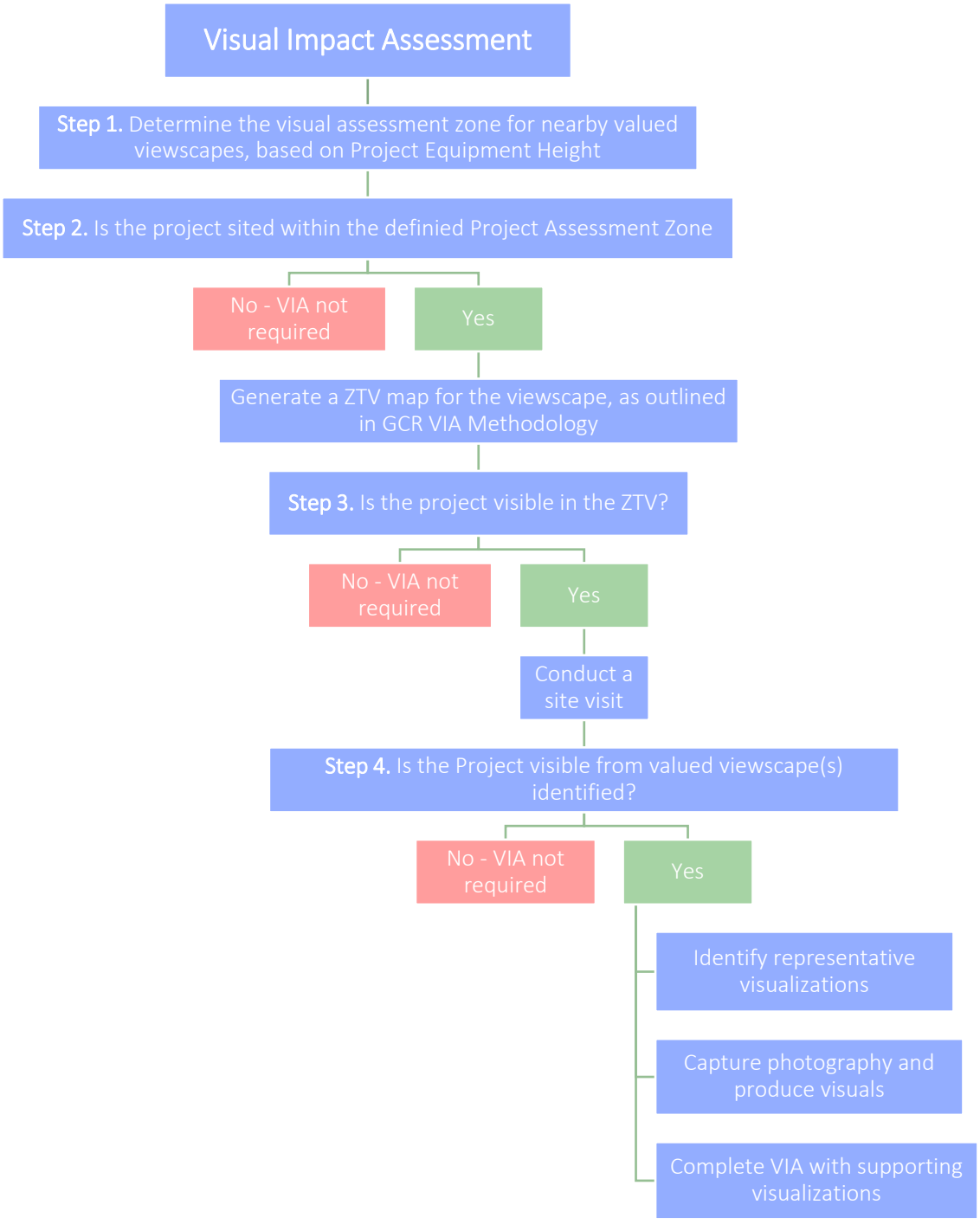

Figure 1 – Process Flow Chart

The GCR VIA Methodology details all the varying aspects outlined in Figure 1, including how a Zone of Theoretical Visibility (ZTV) Map should be prepared and utilized, how visualizations should be prepared, and how the sensitivity, magnitude of change and overall level of effect should be considered on a viewscape should be assessed.

Of note, the GCR VIA Methodology was designed to consider a variety of viewscapes; however, when only considering viewscapes of high sensitivity, the overall consideration of impacts may shift. **Table 2** below is re-produced form the GCR VIA Methodology.

Table 2 – Magnitude and Sensitivity Matrix for Assessing Overall Level of Effect

Sensitivity	Magnitude of Change			
	High	Medium	Low	Negligible
High	Major	Major/Moderate	Moderate	Moderate/Minor
Medium	Major/Moderate	Moderate	Moderate/Minor	Minor
Low	Moderate	Moderate/Minor	Minor	Minor/Negligible

It is expected that the sensitivity of viewscapes identified by the AUC will almost certainly be universally considered as **High**. As a result, the lowest possible overall level of effect when the sensitivity is **High** is **Moderate/Minor**. As such, while the overall level of effect is helpful context, the AUC may find more value in placing higher significance on the magnitude of change identified.

2.2.1 Route Visibility

It is understood that the AUC may consider impacts to routes surrounding valued viewscapes. If routes are to be considered, professional judgement should be used to ensure route segments are directly related to the valued viewscapes of concern. It is also important to consider the proximity of the route to the proposed project, as it should be close enough to share similar landscape views to the assessed viewscapes.

When deciding on the total lengths of roads and highways to include, the assessment must balance the results of the ZTV, the proximity from the projects to the viewscapes, and the nature of the landscape visible by members of the public using these routes. The assessment of routes would follow a similar methodology outlined in the GCR VIA methodology.

2.3 Recommendations

It is recommended that the AUC provide a map and list of viewscapes and locations identified as requiring a VIA. Should the requirement extend to other types of development, GCR recommends that the assessment zone should not be a default 35km and instead should be based on the overall project height.

In the event that a VIA is required, it is recommended that the proponent prepare a VIA utilizing the process detailed in the GCR VIA methodology, as provided in the Inquiry, and summarized **Figure 1**. This would allow the AUC to be able to efficiently and objectively assess the predicted visual impacts of a proposed project.

GCR note that stakeholder and municipal consultation may identify specific viewpoints within an already established study area that are held in high regard, are publicly accessible, and/or would meet the criteria of a valued viewscape established by the AUC. In this situation, there may be justification for this viewscape to be included within the VIA, following the same methodology.

3 Appropriate Field-of-View for Solar Glare Hazard Assessments

Currently, AUC Rule 007 does not specify any parameters for glare modelling, and for that reason, assessments are not consistent across Alberta projects. In a recent Decision Report for the Aira Solar Project[3], the AUC agreed that a ±15° viewing range represents a field-of-view (FOV) related to driver safety, and that the use of a ±25° FOV provides sufficient context for other potential glare impacts on local roads (i.e., range roads and township roads). However, they advised the inclusion of a FOV up to ±50° for provincial highways and railways within 800m of the project. The reasoning behind the inclusion was to identify glare in the range required by the Federal Aviation Administration (FAA) for pilots, to give stakeholders a better understanding of the full extent of glare impacts on ground-based routes.

3.1 Field-of-View Selection

GCR notes that there is additional information available beyond the existing AUC precedent established for glare assessments and field-of-view considerations,[4] such as:

- Zehndorfer Engineering's Solar Glare and Glint Project Report[5];
  - Establishes a summary of a jurisdictional review outlining requirements and parameters, including the application of a ±15° FOV for highways.
- Leden et al.'s study of glare impacts on drivers[6];
  - Study outlines the impact of reflected light on drivers travelling at highway speeds at specific angles from heading (±5°, ±10°, and ±20° FOV).
  - The study concluded that driving performance decreased when glare was observed within the ±5°, while only minor impacts were noted at ±10°, and no performance impacts were observed at ±20° from heading.
  - Based on the study, a ±15° FOV is reasonable to assess the potential solar PV glare impacts that may affect a driver's operation of a vehicle. Glare at or beyond a ±20° FOV has negligible impact.
- Rogers' FAA report for airplane pilots (adapted to suit vehicle operators using ground-based routes)[7];
  - Outlines the study conducted for the FAA, assessing the impact of reflected light on pilots travelling at specific angles from heading (0°, ±25°, ±50°, and ±90° FOV).
  - Study concludes that pilot performance was affected by observable glare at 0° and ±25°, but was not affected by glare observable within the ±50° or ±90° FOV.

[3] Exhibit 27842-D01-2024, Decision Report

[4] AUC Rule 007: *Application for Power Plants, Substations, Transmission Lines, Industrial System Designations, Hydro Developments and Gas Utility Pipelines* (April 2022).

[5] *Solar Glare and Glint Project* (Zehndorfer Engineering, September 2019).

[6] *Verhinderung von Sonnenreflexionen in Lärmschutzwallen – ein Laborexperiment [Obstruction of sun reflections in noise barriers - laboratory experiment]* (Leden, N. & Alferdinck, J.W.A.M. & Toet, Alexander, 2015).

[7] *Evaluation of Glare as a Hazard for General Aviation Pilots on Final Approach* (Rogers, J. A., et al., July 2015).

- Study concludes that the assessment of a ±25° FOV is reasonable to assess the potential solar PV glare impacts that may affect a pilot's operation of an aircraft, and an assessment at ±50° is recommended. Anything beyond ±50° FOV has negligible impact.

- Alberta Transportation Guidelines[8].
  - Establishes the requirement to identify the potential for glare on provincial highways within a ±15° FOV.
  - Establishes heights of vehicles to assess for glare impacts including: Passenger vehicles (1.08m), Single-unit truck or bus (1.8m), large commercial vehicle (2.3m).

In addition to the information presented above, Yang et al. performed a study on peripheral vision in relation to speed[9], which found that peripheral detection of stimuli rapidly declined beyond ±20° FOV during highway driving. The study suggests drivers have a narrower useful FOV during highway driving due to the higher foveal demand (visual information demand). The study also found consistent stimulus detection probability up to ±20° FOV, which demonstrates the applicability of the ±15° FOV for assessing potential glare impacts on driving performance. Furthermore, the experimental study for the Engineering Psychology and Cognitive Ergonomics (EPCE) conference by Jo et al.[10] presented evidence to explain the visual tunneling phenomena that occurs at high-speed driving. The brain must balance the maximum FOV against the maximum amount of visual information a driver can process. The study found that an increase in driving speed increases the amount of visual information to process, and in order to balance the increase in visual information, the visual FOV must decrease.

During the Aira Solar Project AUC Hearing Process, evidence was filed commenting on how apparent brightness of light diminishes with the angle from heading (FOV).[11] It was concluded that the brightness of the glare becomes exponentially less as the angle from heading (or driver FOV) increases. This is inferred by calculating the veiling luminance as outlined in various international standards, which is understood to be the amount of visible light viewed from a specific angle, and is driver dependent. Although GCR does not quantify veiling luminance for glare assessments, the principles of its calculation can be applied to prove the impracticality of covering a FOV up to ±50°.

Veiling luminance has an inverse square relation with the angle from heading. Meaning, when comparing the veiling luminance (or the brightness of glare able to cause visual impairment) at 5° from heading, vs. at 20° from heading, the value at 20° is 16 times less impactful than that at 5°. At 15° from heading (or ±15° FOV), the veiling luminance is 10 times less than at ±5° FOV. Lastly, at ±50° FOV, the glare is 100 times less impactful than at ±5° FOV, and 11 times less impactful than at the edge of the GCR-defined critical range of ±15° FOV.

In the Aira Solar Project Decision, the AUC indicated that presenting conservative glare predictions within ±50° of heading could be helpful to better understand potential glare impacts on highways and railways. However, based on the aforementioned studies, and in GCR's professional opinion, using a range this wide is impractical in predicting the actual glare a driver (or railway user) would experience at high speed.

[8] *Assessment requirements for solar development near provincial highways* (Alberta Transportation, December 2021).

[9] Yang S., Wilson K., Roady T., Kuo J., Lenne M.G., (2022). Beyond gaze fixation: Modeling peripheral vision in relation to speed, Tesla Autopilot, cognitive load, and age in highway driving. *Accident Analysis and Prevention*, 171. https://doi.org/10.1016/j.aap.2022.106670

[10] Jo, D., Lee, S., Lee, Y. (2014). *The effect of driving speed on driver's visual attention: Experimental investigation,* In: Engineering Psychology and Cognitive Ergonomics. EPCE 2014. [Lecture Notes in Computer Science, vol 8532, Springer]. https://doi.org/10.1007/978-3-319-07515-0_18

[11] Exhibit 27842-X0099 page 16, FRAS Response to AIRA IRs

As such, GCR suggests performing glare modeling for all routes (local roadways and highways) and railways with two FOVs, as described below:

- ±15° FOV – to describe the critical region where a driver's vision will be most focused;
- ±25° FOV – to provide a conservative model to represent a person's extended visual range.

Additionally, GCR recommends modeling each route FOV at the three vehicle heights identified by Alberta Transportation. This will make up a total of 6 models per route – 3 heights at ±15° FOV, and 3 heights at ±25°.

Based on the above, GCR suggests the ±50° FOV is not representative of the region where a driver's vision could be affected by glare. Potential glare within the ±15° FOV encompasses the region where glare has the potential to affect a driver's ability to operate their vehicle safely. While the ±25° FOV can provide a representation of a person's extended vision range that could experience glare, the current guidelines and studies do not suggest glare within this range would cause any affect to a driver's ability to operate their vehicle. Therefore, it is considered unnecessary to provide mitigation for glare in the extended range.

It is important to note, that although the default value for FOV using the GlareGauge modelling software is ±50°, this value was defined by the FAA and is specifically aimed at assessing the potential glare impacts to pilots during landing of aircraft. Based on the aforementioned studies and conclusions, these values are not representative for assessing the potential glare a driver or railway user would observe.

Furthermore, given in AUC Decision 27842-D01-2024, the AUC noted a contextual ±25° FOV would be sufficient for minor roads at lower speeds when your visual range is wider, it should be acceptable to use the same FOV (±25°) for high-speed highways and railways when the visual range is narrowed in comparison to low speed. Therefore, by providing both the critical and conservative FOV results for 3 common vehicle heights, GCR believes the glare assessment will provide ample data to characterize the potential glare to a route receptor, without overestimating and providing impractical, unrepresentative data.

3.2 Intersection Analysis

Notwithstanding the recommendations above, it is GCR's professional opinion that significant intersections should not be neglected from glare modelling, or only simply modelled as a route receptor. As vehicles are likely to stop at significant intersections and may be stationary for a period of time while waiting for traffic or a pedestrian, it permits drivers the opportunity to look around and take in a larger range of their surroundings in comparison to a driver actively travelling along a route. Therefore, using only a limited FOV (i.e., ±25°) may not accurately represent the full impact range for the intersection user. Instead, GCR suggests that intersections be modelled as observation points with full FOV (360°) using the GlareGauge software, which provides a better understanding of the glare that could be observed when stopped at an intersection (depending on the time of day and glare impact days).

However, it is important to note that while glare can be assessed at intersections, it does not share the same level of risk as someone actively driving on a road (or railway by extension). The results of glare assessments at intersections will be overpredicted, given the model will be run using a continuous time frame with a full FOV (360°). In reality, users of the intersection will only be at the intersection for a few seconds, or up to a few minutes at a time. It also does not account for when an intersection user is facing a different direction from a glare source, such as approaching the intersection from an angle facing away from the proposed project. Users are also in a static position and able to mitigate their own risks by only proceeding through the intersection when safe to do so (i.e., when glare is not impacting their view).

When evaluating an intersection, the observer is considered to be static while they are checking for traffic or pedestrians on cross-roads. A reasonable driver at an intersection would have ample time to adjust to cross-traffic and mitigate potential risks by only proceeding into the intersection once it is safe to do (this includes considering any glare that is present). For that reason, the evaluation of glare at intersections serves only to inform how frequently glare may be reflected toward that specific location, but the results do not correlate with a safety risk.

All of this furthers the conclusion that modelling intersections overpredicts glare, given the glare risk will only occur for a short period of time on specific days of the year; and can only create a risk when there happens to be a driver stopped, facing the correct direction, during the exact time frame that glare is predicted to occur. In the unlikely event this does happen, since the driver is in a static position, they also have a defense mechanism, being their ability to mitigate the glare risk themselves and only proceed into the intersection when it is safe to do so.

GCR suggests significant intersections should include:

- Intersections between two provincially numbered highways;
- Intersections between any provincially numbered highway and local road;
- Intersections between any provincially numbered highway and railway;
- Intersections with 1 or more heavily travelled roads (could be major roadways, tourist locations, etc.);

GCR recommends modelling intersections at the three most common vehicle heights as identified by Alberta Transportation guidelines.

GCR proposes to use the definition for a heavily travelled road from AUC Rule 012, whereby a heavily travelled road includes highways and any other road where 90 or more vehicles travel during the nine-hour nighttime period (between 22:00 – 7:00) consistently for any one-month period in a year[12]. When there is an intersection with a major roadway within 800m of a project boundary that is found to classify as a "heavily travelled road", it may be assessed as a significant intersection in the glare assessment. The below methods can be used to assess the traffic volume, as per AUC Rule 012:

- Traffic count by attended technician for the entire nighttime period (with dates documented);
- Traffic count by audio recording during the sound monitoring period (with dates documented);
- Hourly traffic volume data from Alberta Transportation or other municipalities;
- Alberta Transportation's Average Summer Daily Traffic (ASDT) value;
  - 10% of the ASDT value is assumed to be the nighttime period traffic;
- Alberta Transportation's Annual Daily Traffic (AADT) value (if ASDT not available);
  - 10% of the AADT value is assumed to be the nighttime period traffic;

For all of the reasons above, GCR conclude that the results of the intersection are much less significant than the modelled route, and the results of which should not impact mitigation measures. Instead, GCR believes the intersection analysis should only be used to provide context on the times that glare could be occurring at different times of the year, for better understanding the potential glare an intersection user may experience.

[12] AUC Rule 012: Noise Control

4 Setbacks for Renewable Energy Projects

The AUC have requested comments on whether setbacks should be established for renewable energy power plants and BESS facilities from certain infrastructure including: residences, hospitals, schools, parks, roads, railways; aerodromes, and industrial facilities.

All of the infrastructure types identified have existing regulatory and governing bodies responsible for their operation, including identifying minimum setback requirements. There are defined regulatory bodies for roads, railways, and aerodromes, all of which are responsible for identifying respective setbacks for all forms of development. In addition, most municipalities have considerations for development siting near schools, hospitals and residences. Currently, it is expected that these agencies would be consulted on proposed projects. It is further considered these agencies are best placed to comment on the need for setbacks rather than the AUC, such as for setbacks relating to aerodromes, roads and railways, as the AUC are not experts in these types of infrastructure. It is considered a concerning overreach for the AUC to determine that these agencies requirements and review are not sufficient to maintain the public interest test for a proposed power plant.

To date, the AUC has not established setbacks, rather AUC Rule 007 details the requirement for the completion of studies and assessments that identify and define potential impacts to nearby stakeholders and infrastructure. These studies form the basis for consideration of power plants on their own specific merits and impacts.

Any generation facility could potentially have adverse impacts; however, these impacts are not universal or certain to occur in all situations. In many cases, issues of concern for one project are not applicable to another, or are conservatively over-represented, or is materially less impactful than other developments not considered by the AUC. The AUC has a 15-year history of successfully and reasonably considering projects, including renewable energy developments, on their own impacts and merits.

While arguments are routinely made to the AUC that renewable energy facilities are new to the province, and the impacts are not understood, renewable energy projects have been operational in this province for decades. The first wind project in Canada was constructed in Alberta, in 1993, with the majority of active wind farms in the province constructed in the late 2000's, over 15 years ago. Further, the first utility scale solar power plant, sited next to a major highway and adjacent residences and the city of Brooks, was operational in 2017, seven years ago. As such, the typical impacts of these facilities are known, and can be assessed and considered.

There are typically location and project-specific considerations that would be discussed and analyzed in risk-related technical assessments, but not considered in a universal setback. Based on our experience, GCR believe that handling potential risks on a case-by-case basis and not implementing a universal setback is the most robust and fairest way to proceed to benefit everyone involved in renewable energy development and operations.

4.1 Current AUC Process

The AUC currently relies on the results and conclusions of technical assessments and studies to understand and consider the impacts of power plants on a project-specific basis. These studies are conducted during early stages of project design to facilitate stakeholder engagement. These assessments and studies are typically conservative of the potential impacts of a power plant to ensure that the final constructed design will be compliant with rules, precedent and standards.

In considering the impacts of a proposed project, and the subsequent consideration of setbacks, it is important to recognize the conservative parameters that are applied to renewable projects; including:

- Noise Impact Assessment
  - Assumes all equipment operate continuously (i.e. operating 24/7); Receptors are assessed as being downwind from all sound sources.
- Solar Glare Hazard Assessment
  - Does not consider impact reduction from sun-masking, inclement weather, or existing screening or obstruction; Assumes that a viewer has clear visibility and is always in position to view glare.
- Shadow Flicker Assessment
  - Does not consider impact reduction from inclement weather; Assumes a residence has visibility of all turbines simultaneously, and does not consider window location; Assumes that a viewer has clear and unobstructed visibility and is always in position to view shadow flicker.

Ultimately, each proposed project is going to have unique considerations, such as, existing development in the area, topography and terrain, dwelling density, and the visibility of a project from certain locations. To date, the AUC and has an established processes in place to understand the impacts of a proposed project on a case-by-case basis to residents and determine, based on the results of those assessments, whether the impacts are acceptable.

It is not possible to apply a universal, and reasonable, setback which captures the nuance of the project specifics, and the specifics of the location being considered, that will adequately ensure that impacts are within defined limits. There will always be the need to consider case-by-case, and this results in a process that is far more robust and transparent for proponents and stakeholders.

4.2 Impact Mitigation

Project siting considers all regulatory permitting requirements as well as stakeholder engagement feedback, to be incorporated into the project design. This includes the completion and consideration of technical assessments and studies. If predicted impacts are determined by the practitioner to warrant mitigation, potential mitigation measures can be appropriately designed on a case-by-case basis to address, reduce or eliminate the specific impact. For each potential impact, there are a great many proven and feasible mitigation measures available should mitigation be necessary. As such, projects can be responsibly sited in proximity to neighbouring properties whilst maintaining impacts within acceptable limits. As such, there is no need for an arbitrary universal setback.

Ultimately, GCR believe that mitigation should be founded on results of assessment following regulation already in place, coupled with meaningful engagement to ensure the impacts are understood.

4.3 Recommendations

In the matter of whether to implement a universal setback distance from renewable energy projects from residences or other receptors, GCR recommend that the AUC does **not** implement a predetermined and arbitrary setback, and instead continue to consider project-specific impacts on a case-by-case basis in order to reflect the unique nature and circumstances of each individual project, and each individual who has the potential to be affected by it. .

Ultimately, it is far more transparent to all parties to consider each project, and each potential impact, as unique to better represent the large number of factors involved in characterizing a potential risk or nuisance, and to better suit the needs of those affected. Concern-specific engagement and case-specific analysis promote better relationships between developers and stakeholders and allow affected parties to have their concerns heard out, in addition to providing a better technical understanding of the project.

5 Interim Requirements for Power Plant Applications

The AUC interim requirements for power plants outline the application requirements related to Agricultural Land Impacts, Municipal Land use, Viewscapes and Reclamation Security. GCR have provided detailed comments on viewscapes in **Section 2.** GCR consider comments on decommissioning security are better suited to come from developers that are owning and operating these facilities and have not provided comment on this issue.

5.1 Agricultural Land – Conservation and Reclamation

While not explicitly related to the interim requirements, conservation and reclamation are directly related to the long-term impacts to agricultural lands, and should be weighed in consideration of impacts to agricultural lands.

As a requirement of end-of-life management for power plants in Alberta, AUC Rule 007[13] requires that wind and solar power plants submit a Conservation and Reclamation Plan (C&R Plan) in accordance with the *Conservation and Reclamation Directive for Renewable Energy Operations*[14] (the C&R Directive), guided by the *Environmental Protection and Enhancement Act* (EPEA). The C&R Directive outlines an operator's responsibility to return the land to 'equivalent land capability' (ELC) upon reclamation. The ELC outcome can be described as the ability of the land to function after conservation and reclamation being similar to the ability that existed prior to an activity being conducted on the land. A significant reason for this requirement is to address concerns about loss of 'prime agricultural land', which is stated to be a major concern of the public and the AUC, as outlined in the Rule 007 interim information requirements.

5.1.1 Efforts to Maintain Equivalent Land Capability

Common concern for soil impacts involves questions of changes in soil quality and quantity, soil contamination, spread of weeds and invasive species, and loss of native vegetation. Fortunately, mitigation measures exist for each of these concerns, and are addressed at the project-specific level during the development of the C&R Plan. Soil removal and storage in addition to stockpile and site seeding with pre-disturbance plant communities are practices used for maintaining soil quality during the project lifetime, and are requirements of the C&R Directive. As a means to combat the concerns, the proponent must implement weed management plans and soil conservation practices throughout the project lifetime as a means to conserve the quality of the land, which are project-specific and detailed in C&R Plans.

An emerging practice of renewable energy projects, specifically solar projects, is the integration of these projects with agricultural activities, known as agrivoltaics. Agrivoltaics not only provide an opportunity for the continuation of agricultural production on the project lands throughout the project life, but also act as weed control and soil maintenance, and has the potential to enrich the soils to greater than pre-project quality, through erosion control, desertification prevention, and moisture retention[15].

[13] AUC Rule 007: *Application for Power Plants, Substations, Transmission Lines, Industrial System Designations, Hydro Developments and Gas Utility Pipelines* (April 2022)

[14] Government of Alberta – Alberta Environment and Parks (GOA: AEO). 2018. Conservation and Reclamation Directive for Renewable Energy Operations

[15] The Agrivoltaic Potential of Canada (January 2023)

5.1.2 Recommendations

A trait among renewable energy power plants that is different among other types of pr, is that these projects only generate a temporary disturbance on the land, as project lifetimes are approximately 30 years. Additionally, renewable energy projects are at lower risk than other types of development for contamination, as stated by the AUC's Module A Report, as contamination is a greater risk in extractive industries.

Understanding renewable energy projects to be a driver of agricultural land loss in Alberta may be misguided, as "power plant development has not historically been a primary driver of agricultural land loss in Alberta"[16]; between 2019 and 2021, the largest driver of agricultural land loss was pipeline expansion and non-renewable industry development, followed by urban residential development[6]. Conservation and reclamation requirements for more impactful developments should align with the more robust C&R requirements of renewable energy projects. For these other types of developments, C&R requirements have no requirement for preservation of agricultural land, despite them posing a larger threat to these lands. In fact, the AUC Module A Report estimates that with renewable energy projects enabling a net-zero province by 2041, and with all of these projects occurring on Class 2 land, there would be a less than 1 percent loss of Class 2 agricultural land in Alberta[9].

The current design of C&R requirements for renewable energy projects are amply capable of ensuring effective reclamation of projects, as they contain accepted best management practices, industry standards, and project specific requirements. Further, through the AUC's decision on the Three Hills Solar Project, the AUC recognizes that project reclamation preserves the agricultural capabilities of the land[17]. It is also important to recognize that landowners have a right to use their land as they see fit and have a unique understanding of the quality of the land and soil impacts. While C&R Plans outline directions for land reclamation, course of action for reclamation is ultimately the decision of the landowner.

GCR sees additional reclamation requirements for renewable projects as unnecessary, as it is reasonable to assume that project lands will be returned to an ELC state due to the following:

- Reclamation is an existing requirement of renewable power plants upon decommissioning;
- Power plants are not a primary driver of agricultural land loss;
- Renewable projects are inherently lower risk for soil contamination and salinization compared to other development;
- The existence of diverse mechanisms of preserving soil health; and
- The satisfaction of the AUC of current reclamation requirements

Due to the above-mentioned features of renewable energy projects, GCR suggests no further C&R requirements be implemented.

5.2 Municipal Development Requirements

The rules set out by the AUC are designed to set out requirements and processes in relation to regulated utilities in Alberta. While the AUC does engage with municipalities, stakeholders, developers, and consultants, the AUC process can become much more complex in situations where municipal regulations do not align with AUC Rules. While requirements set out by the AUC do take precedent over municipal regulations, this can become a point of contention

[16] AUC inquiry into the ongoing economic, orderly and efficient development of electricity generation in Alberta (January 2024)
[17] Decision 28086-01-2024 – Three Hills Solar Project

during the public consultation process and may create feelings of hostility and distrust among the municipality and community towards the developer and consultants. In particular, this can occur when discrepancies occur between municipal bylaw requirements, and the requirements of AUC Rule 007 and Rule 012.

For example, certain municipalities in the province have differing requirements on noise. Certain counties request an analysis for noise at any habitable dwellings within 2km of a renewable energy project; however, AUC Rule 012 only has a 1.5km requirement. [18] In addition, certain municipalities may require assessments at locations that do not meet the definition of a receptor, as defined in Rule 012. These inconsistencies can include requiring noise measurements at the base of turbines, or on property lines, neither of which are related to the consideration of a receptor. With the developer abiding by the lesser conservative assessment radius, this has the potential to present poorly to the community, adding more strain on the developer-community relationship. However, the developer is abiding by Rule 007 and Rule 012 regulations as these take precedent over municipal requirements.

Certain municipalities also have requirements for visualizations, such as requiring visualizations of a project from **all** dwellings within a certain radius. Developing visualizations of the project site is a complex, time consuming task, and it is therefore not always possible to meet MD visualization requirements. GCR consider these kinds of requirements to be arbitrary, and do not necessarily represent the context of the overall visual impact of the project development. GCR suggest that it is more appropriate to provide representative visualizations from mutually agreed locations and accompany the visualizations with a visual impact assessment.

Other examples of discrepancies in requirements include differences in public consultation requirements, public consultation radius, and project siting setbacks. Conflicting requirements for project components complicates the development process, and then requires the AUC to consider the non-compliance in its public interest test.

5.2.1 Recommendations

Stakeholder concerns are a priority for developers and are addressed as best as possible through the project development and engagement process. The discrepancy between municipal requirements and AUC requirements has historically created challenges during the development of renewable energy projects, and while consideration should be given to certain municipal requirements, the consideration of more technical impact studies and requirements should be made more consistent with the AUC requirements to alleviate confusion and streamline the approval process. For example, project noise is considered and controlled through AUC Rule 012, which outlines a clear methodology for assessing noise and determining cumulative sound limits. Additionally, the update of AUC Rule 007 will highlight community interests for power plant applications, and municipalities should therefore trust that the AUC's Rules and process are ample in considering community interests.

It is recommended that in its consideration of technical impacts assessments, such as noise, solar glare, shadow flicker and visual impact, the AUC should prioritize consideration of whether a developer has maintained compliance with the AUC Rules and established standards. It is also recommended that as part of the process, the AUC encourage municipalities to review the requirements of Rule 007 and Rule 012 when developing municipal requirements for power plants.

[18] AUC Rule 012: *Noise Control* (March 2021)

6 Ambiguities or Opportunities for Efficiencies in Existing Process

6.1 Consideration of the Wildlife Directive

AUC Rule 007 requires proposed renewable energy projects obtain a signed renewable energy referral report from Alberta Environment and Protected Areas (AEPA), which is prepared by qualified wildlife biologists to classify the environmental risk posed by the proposed project, based on siting and environmental protection mitigation measures proposed. The Wildlife Directive for Alberta Wind Energy Projects[19] and the Wildlife Directive for Alberta Solar Energy Projects[20], hereby referred to as the Wildlife Directives, outline the impacts that renewable energy projects may have on wildlife and sensitive habitat, and define environmental protection requirements for these projects. Mitigation and protection strategies for environmental effects are adaptive and location-specific, and AEPA is a collection of experts who quantitatively determine environmental risk of proposed renewable energy projects.

As stated by the Solar Wildlife Directive, "each project is unique and may require an adaptive approach; therefore, this document does not preclude alternative mitigation identified by the AEPA Wildlife Biologist and solar energy project developers".[11] Due to the adaptive and nuanced nature of environmental mitigation strategies, there has been confusion regarding AEPA recommendation and the wording of the Wildlife Directives, creating points of contention among the AUC and project proponents.

The Wildlife Directives are required to be updated at least every ten years, and consequently the wind and solar wildlife directives have not been updated since 2018 and 2017, respectively. However, in that time, the renewable energy market has shifted dramatically in Alberta, and the Wildlife Directives should be adjusted to reflect these market changes and add clarity to siting and assessment requirements. Further, there are discrepancies between requirements in the wind and solar Wildlife Directives, and these should be updated to align.

Wildlife and environmental assessments are nuanced, cumulative, and complex; GCR believe that the Wildlife Directives should be updated to emphasize this nuance, as it is essential in ensuring that readers understand that the information presented by the document is layered and intricate. AEPA have an established, accepted framework for assigning risk to a project, and thus are best equipped to develop and consider mitigation strategies. It is recommended that AEPA should be responsible for the development and consideration of alternative mitigation measures for environmental risks of renewable energy projects, and not the AUC. However, an opportunity for collaboration between the AUC and the AEPA could involve consultation in the process of updating AUC rules and AEP Wildlife Directives, so as to consolidate information and improve clarity between the regulation and reduce risk for developers. Effective mitigation strategies to minimize the environmental impact of a project are crucial, and the AUC should recognize AEPA's ability to develop effective strategies on a project- and site-specific basis that best suits the unique project location.

[19] Directive: Wildlife directive for Alberta wind energy projects (September 2018)
[20] Directive: Wildlife directive for Alberta solar energy projects (September 2017)

GCR recommend that as part of this update, AEPA should incorporate data and findings from current operational renewable energy projects, as this information was not as readily available in 2017 and 2018. For instance, post-construction mortality monitoring data from these projects reflect the present-day risks wildlife face against renewable energy projects. Using this data in current risk analyses will only generate more accurate, up-to-date conclusions and effective mitigation measures.

6.2 Checklist Applications

Checklist applications are a simplified AUC process for proposed projects that are less than 10 MW in capacity, with the purpose of the process being to expedite the approval of power plants that are not expected to have an impact on stakeholders or the environment. Checklist applications still require a proponent be able to demonstrate compliance with AUC Rules and provincial regulations; including, confirming no adverse environmental impacts, compliance with Rule 012, and confirmation the project does not directly or adversely impact stakeholders. If the proposed project cannot demonstrate the above, the AUC would require a full Rule 007 application be filed.

Ultimately, the purpose of an AUC application is to provide the AUC with the information it needs to make a decision on a proposed project. While in certain cases it may be reasonable to consider a full Rule 007 application for a small-scale project in a situation of non-compliance, there are going to be situations of non-compliance for which a full application would not provide any more beneficial information for the AUC to make a decision. For example, a full suite of environmental surveys and reporting would not provide the AUC helpful information in the event of a noise compliance issue.

There are material costs, time and effort required to prepare the full suite of reports and documents needed for a full AUC Rule 007 application. Therefore, the requirement for such information should be weighed heavily against the issue resulting in non-compliance. It is recommended that the AUC require information on the specific issue resulting in non-compliance and only in situations of multiple instances of non-compliance should a full application be required.

This approach would represent an effective and efficient regulatory process for the AUC to adopt and would allow it to conduct the necessary regulatory review of the application and project impacts, while preserving the intent of a simplified process for small-scale, low impact projects.

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