MEMO

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Via email.

FROM: Roberto Martinez, P. Eng.

SUBJECT: Burdett Updated Solar Glare Study

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REF: 201-06345-00

BACKGROUND

WSP has performed an update to the independent glare assessment[1] for the Burdett Project (the "Project") on behalf of BluEarth. The project is located approximately 70 km south-west of Medicine Hat, Alberta and 2 km to the south-east of Burdett. Table 1 shows the previous and new project design parameters that affect the glare results. This memo provides a summary of the methodology and results for the updated analysis.

Table 1: Project Design Comparison

	2019 Report[1]	2020 Update[2]
Project Size	30.4 MW_{DC}, 20 MW_{AC}	30.93 MW_{DC}, 20 MW_{AC}
Racking Style	30 Degree Fixed Tilt	25 Degree Fixed Tilt
Ground Clearance	1 m	0.9 m
Azimuth	180 Degrees (South)	180 Degrees (South)

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[1] BluEarth_Burdett_GlareStudyReport_20190731_v1.pdf. July 2019
[2] Burdett Solar - 2P Site Layout Sungrow (20 MWAC - 420W Modules) Rev.2.pdf, June 2020

METHODOLOGY AND RESULTS

The glare model[1] was updated to account for the following changes:

- Project layout has been updated according to the new layout provided by BluEarth[2]. The site entrances have been updated accordingly.
- The ground clearance was lowered to 0.9 m from 1.0 m to match the layout[2].
- The tilt was decreased from 30° to 25° as per the layout design[2].
- The module model has changed but this does not affect the assumptions from the previous assessment.

The updated glare results for intersection and receptors are shown in Table 2 and Table 3, respectively. For comparison purposes the results from the previous analysis are shown in Table 4 and Table 5. Overall the change in the glare results due to the project design changes was found to be minimal. Below are the general conclusions from the updated analysis:

- Receptors and intersections previously reported with no glare have not changed.
- The glare hazard (yellow) at the affected locations has not changed.
- The daily maximum glare is lower except for:
    - TWP 102 and RR 122: Increased by 1 minute.
    - TWP 102 and RR 123: Increased by up to 8 minutes.
    - Receptor 2: Increased by 6 minutes.
    - Receptor 7: Increased by 4 minutes
- The affected months are the same or reduced.

Table 2: Updated Glare Results at Intersections

Intersection	Glare Intensity	Affected Months	Affected Times of Day (Approximate) (MST)	Maximum Daily Glare at 1.5 m (Minutes)	Maximum Daily Glare at 3.0 m (Minutes)
Hwy 3 and RR 122	None	-	-		
Hwy 3 and RR 123	None	-	-		
TWP 102 and RR 122	Yellow	March-September	6:05 PM-6:45 PM	11	13
TWP 102 and RR 123	Yellow	March-September	6:20 AM-6:45 AM	15	15
East Access Road Intersection	Yellow	March-September	6:00 PM- 6:35 PM	12	16
South Access Road Intersection	Yellow	March-September	6:15 PM- 6:35 PM	15	19

Table 3: Updated Glare Results at Receptors

Receptor	Assessment Height	Glare Intensity	Affected Months	Affected Time of Day (Approximate) (MST)	Maximum Daily Glare (Minutes)
1	3 m	Yellow	March-October	5:00 PM-7:00 PM	19
2	4.5 m	Yellow	April-September	6:35 AM-6:55 AM	24
3	4.5 m	None	-	-	-
4	4.5 m	None	-	-	-
5	4.5 m	None	-	-	-
6	4.5 m	None	-	-	-
7	4.5 m	Yellow	March-September	6:20 AM-6:45 AM	15
8	4.5 m	None	-	-	-
Substation	4.5 m	Yellow	March-October	5:00 PM-7:00 PM	25
Cogeneration Facility	4.5 m	Yellow	March-September	6:05 PM-6:35 PM	14

Table 4: Previous Assessment Glare Results at Intersections

Intersection	Glare Intensity	Affected Months	Affected Times of Day (Approximate) (MST)	Maximum Daily Glare at 1.5 m (Minutes)	Maximum Daily Glare at 3.0 m (Minutes)
Hwy 3 and RR 122	None	-	-		
Hwy 3 and RR 123	None	-	-		
TWP 102 and RR 122	Yellow	March-September	6:00 PM	10	13
TWP 102 and RR 123	Yellow	March-September	6:45 AM	7	11
East Access Road Intersection	Yellow	March-September	6:00 PM	40	48
South Access Road Intersection	Yellow	March-October	7:00 AM and 6:00 PM	19	25

Table 5: Previous Assessment Glare Results at Receptors

Receptor	Assessment Height	Glare Intensity	Affected Months	Affected Time of Day (Approximate) (MST)	Maximum Daily Glare (Minutes)
1	3 m	Yellow	February-October	5:30 PM	44
2	4.5 m	Yellow	April-September	6:30 AM	18
3	4.5 m	None	-	-	-
4	4.5 m	None	-	-	-
5	4.5 m	None	-	-	-
6	4.5 m	None	-	-	-
7	4.5 m	Yellow	March-September	6:30 AM	11
8	4.5 m	None	-	-	-
Substation	4.5 m	Yellow	March-October	6:00 PM	33
Cogeneration Facility	4.5 m	Yellow	March-September	6:00 PM	17