MEMO

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Via email.

FROM: Roberto Martinez, P. Eng.

SUBJECT: Yellow Lake 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 Yellow Lake Project (the "Project") on behalf of BluEarth. The project is located approximately 70 km south-west of Medicine Hat, Alberta and 20 km south 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}, 19 MW_{AC}	30.03 MW_{DC}, 19 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_YellowLake_GlareStudyReport_20190809_V2.pdf, July 2019
[2] Yellow Lake Solar - 2P Site Layout Sungrow (19 MWAC - 420W Modules) Rev.4.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 ground clearance was lowered to 0.9 m from 1.0 m to match the layout diagram.
- The tilt was decreased from 30° to 25° as per the layout design.
- 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 access road intersection (1.5 m) which is 6 minutes longer.
- 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 m (Minutes)
TWP 82 and RR 120	None	-	-	-	-
TWP 82 and RR 121	None	-	-	-	-
TWP 82 and RR 122	Yellow	May-July	6:00 AM-7:00 AM	8	2
Access Road Intersection	Yellow	March-May August-September	6:00 AM-7:00 AM	13	14

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	4.5 m	None	-	-	-
2	4.5 m	None	-	-	-
3	4.5 m	None	-	-	-
4	4.5 m	Yellow	June-July	6:25 AM-6:40 AM	2
5	4.5 m	None	-	-	-

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 m (Minutes)
TWP 82 and RR 120	None	-	-	-	-
TWP 82 and RR 121	None	-	-	-	-
TWP 82 and RR 122	Yellow	May-August	6:20 AM-6:50 AM	13	11
Access Road Intersection	Yellow	March-May August-September	6:20 AM-6:50 AM	7	15

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	4.5 m	None	-	-	-
2	4.5 m	None	-	-	-
3	4.5 m	None	-	-	-
4	4.5 m	Yellow	May-July	6:45 AM	11
5	4.5 m	None	-	-	-