Addendum to the Sunrise Wind Biological Assessment to USFWS

Pursuant to Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, on December 16, 2022, the Bureau of Ocean Energy Management (BOEM) requested formal consultation with the U.S. Fish and Wildlife Service (USFWS) regarding species that may be affected by the approval of a Construction and Operations Plan (COP) for the for the Sunrise Wind project, a commercial wind energy facility located within BOEM's OCS-A 0487 Lease Area offshore New York, Rhode Island and Massachusetts.

Since the submission of the Biological Assessment (BA), the Stochastic Collision Risk Assessment for Movement (SCRAM) model was very recently updated. In addition, BOEM received some information from the lessee regarding details of the project due to foundation feasibility concerns related to the presence of glauconite sands within the Lease Area. The number of feasible wind turbine generators (WTGs) has been reduced from up to 94 WTGs within 102 potential locations to a range between 80-87 WTGs within 87 potential locations. Further, BOEM also received further details on the monthly operational inputs for the SCRAM model (Table 1). BOEM re-ran the SCRAM model with 87 turbines and updated operational information on the piping plover, red knot and roseate tern. Tables 2 and 3 summarize the results of the runs. The model input file and SCRAM reports are provided as attachments to the email that transmitted this addendum.

Table 1. Monthly operational data for Sunrise Wind. These numbers include down time for maintenance.

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
Mean operational time (proportion)	0.9106	0.9125	0.9107	0.9092	0.8998	0.8998	0.8797	0.8856	0.8890	0.8980	0.9038	0.9119
Maximum (mean + 1 SD)	0.9246	0.9243	0.9230	0.9203	0.9180	0.9213	0.9023	0.9032	0.9137	0.9166	0.9142	0.9248
Minimum (mean - 1 SD)	0.8967	0.9007	0.8985	0.8982	0.8815	0.8782	0.8572	0.8680	0.8643	0.8794	0.8934	0.8989

Generally, the results of the analyses are similar to those in the BA, except for the Red Knot. SCRAM predicted that the annual probability of a collision was 0.999 (Table 2) suggesting that collision with turbines were very likely. SCRAM also predicted that the average annual number of collisions were greater than 1 (Table 2). Not surprisingly, the probability of a collision event during the 35-year operational period is also very likely 1.00 (Table 3), and the average number of collisions were greater than one (Table 3).

However, the estimated number of red knot collisions are very likely biased high for a couple reasons: 1) SCRAM uses Red Knot population sizes that is larger than the number of birds that are likely to be transiting waters near the US Atlantic offshore leases during fall migration. A recent study found that 81% (118 out 146) of the red knots fitted with radio transmitters could transit the US Atlantic region where offshore leases are located during fall migration (Loring et al. 2020); this suggests that the fall population sizes used in SCRAM are likely biased high by 19 precent. 2) SCRAM uses population sizes and movement data to estimate the number of birds within a 50km x 50 km grid cell containing the project. In some grid cells, the modeled estimate of the number of birds can be very large. For example, in a grid cell for another project, the estimated number of birds during

September exceeds the population size of 72,250 by more than 10,000 animals, thus leading to wildly inflated estimates of collisions. The grid cell that contains Sunrise Wind is estimated to have 38,850 birds in September – more than half the total population size! For these reasons, BOEM believes that the SCRAM estimated number of red knot collisions are unrealistically high.

Based on the combination of the updated SCRAM model and the new information from the developer, BOEM's determinations in the BA (December 16, 2022) remain the same where the Proposed Action would not likely to adversely affect roseate terns and piping plovers, but is **likely to adversely affect** red knots.

Table 2. Annual model outputs. Values greater than one are in bold.

Species	SCRAM	SCRAM
	Probability of collision [a]	**Collisions (95% Prediction Interval)** [b]
Piping Plover	< 0.001	0.002 (0.000 - 0.005)
Red Knot	0.999	**36.6** (30.3 - 43.1)
Roseate Tern	< 0.001	0.000 (0.000 - 0.000)

[a] SCRAM report, SCRAM run details, p. 2
[b] SCRAM report, Table 9

Table 3. Life of project (35 years) - Extrapolated from model outputs. Values greater than one are in bold.

Species	**Probability of collision** [a]	**Collisions (95% Prediction Interval)** [b]
Piping Plover	0.034	0.1 (0.0 - 0.2)
Red Knot	1.000	**1,281.5** (1,060.5 - 1,508.5)
Roseate Tern	0.034	0.0 (0.0 - 0.0)

[a] Probability $_{life}$ = 1-(1-Probability $_{annual}$) ^{Years}
[b] Collisions $_{life}$ = Collisions $_{annual}$ × Years