



Amy Sloan - NOAA Federal <amy.sloan@noaa.gov>

Urgent Situation

1 message

Steve Coan <scoan@mysticaquarium.org>

Thu, Apr 14, 2022 at 5:03 PM

To: "Amy Sloan (Amy.Sloan@noaa.gov)" <amy.sloan@noaa.gov>

Cc: Mary O'Brein <mary.obbrien@noaa.gov>, Jennifer Skidmore <jennifer.skidmore@noaa.gov>, Deb Fauquier <deborah.fauquier@noaa.gov>, Courtney Smith <Courtney.smith@noaa.gov>, Allison Tuttle <atuttle@mysticaquarium.org>, Molly Martony <mmartony@mysticaquarium.org>, Jim Lister <jlister@bhb.com>

Dear Amy,

An urgent situation has developed regarding Mystic Aquarium's belugas. Mystic Aquarium's belugas had been doing well with the breeding prevention plan, performing ultrasounds to monitor follicular activity, and gating separately if they will not perform the ultrasound until last week. However, since the end of last week beluga Sahara's behavior has been increasingly distracted and she is no longer performing her ultrasounds. In accordance with our breeding prevention plan and the permit, Sahara is presently gated separate from the male in the habitat. While we do not think she is actively cycling, by default we must keep her separate when she will not do her ultrasound. The separation is longer than anticipated because Sahara has continued to refuse the behavior. The separation is unwelcome to Sahara, who now is separated from both the male and the female beluga with the male so that he has companionship. Now all the animals are intensely focused on each other presently, to the distraction of their daily routine.

Given this situation, the focus has been on delivering food, without much ability to work on and maintain training behaviors needed for medical husbandry purposes. Most of the animals are not doing their husbandry behaviors reliably. Most are getting full diet, but, significantly, Sahara has been short the past 2 days, receiving 95%. She is not willing to do behaviors as she is focused on the location of the other animals. If this persists for more than a short time, both the inability to conduct routine health monitoring through husbandry behaviors on her and the other belugas and the reduction in diet would be concerning.

To mitigate these secondary effects from the gender separation, and to have the ability to adjust the social groupings for separations as optimal for animal management, we are requesting permission to ensure compliance with the prevention of breeding plan by providing a short-term contraception medication to Sahara. We would like to administer altrenogest (Regumate) at 0.044 mg/kg PO SID, administered daily in the fish diet. The last ultrasound Sahara performed occurred on April 5th and confirmed that the animal was not actively cycling (no follicles) and was not pregnant. Thus, the medication can be started immediately to allow mixing 24 hours later. Altrenogest is the most used medication for cetacean contraception and is thought to be safe for short term usage in belugas. This medication has been used successfully in belugas at other facilities in the application being proposed.

Ultrasounds and behaviors have been reliably occurring on Kharabali with no to minimal follicular activity observed.

Given the urgent nature of the situation, Mystic Aquarium requests permission to make this adjustment to our methodology short-term for the benefit of the whales allowing us to optimize our animal management in this first breeding season. Following receipt of short-term temporary approval, if granted by NMFS, we will follow this email with a more complete amended breeding prevention plan for your review. This is daily contraception, so its use can be immediately stopped with no irreversible effects were NMFS to grant temporary approval and then later, following further discussion, a different course is taken. The permit authorizes use of contraception or gender separation, but we recognize that the breeding prevent plan requires approval before switching from gender separation to contraception.

Thank you for your guidance and your time.

Steve

Stephen M. Coan, PhD

President and CEO

55 Coogan Boulevard

Mystic, Connecticut 06355

Office: 860-572-5955 x605

Cell: 860-625-2101

www.mysticaquarium.org





Amy Sloan - NOAA Federal <amy.sloan@noaa.gov>

Request

1 message

Allison Tuttle <atuttle@mysticaquarium.org>

Tue, May 24, 2022 at 2:17 PM

To: Amy Sloan - NOAA Federal <amy.sloan@noaa.gov>

Cc: Steve Coan <scoan@mysticaquarium.org>, James Lister <jlister@bhb.com>

Dear Amy,

For reasons of optimal animal management, Mystic is requesting permission to extend the attached temporary authorization to use contraception in beluga Sahara to beluga Kharabali, while our amendment request and response to NMFS questions on the amendment request are reviewed. Having the ability to manage Kharabali with contraception would provide the needed flexibility to optimally manage all animals in the population.

Thank you for your consideration.

Best Regards,

Allison

Allison D. Tuttle, DVM, Diplomate ACZM

Senior Vice President, Chief Zoological Officer[55 Coogan Boulevard](#)[Mystic, Connecticut 06355](#)

Office: 860-572-5955 x101

www.mysticaquarium.org

 22629 Contraceptive temp approval.pdf
215K



55 Coogan Boulevard
Mystic, CT 06355
P 860 572 5955
F 860 572 5969
W mysticaquarium.org

April 20, 2022

Amy Sloan

Deputy Chief, Permits and Conservation Division
Office of Protected Resources
NOAA Fisheries | U.S. Department of Commerce

Re: Permit 22629: Request for Approval - Beluga Breeding Prevention Plan Update

Dear Ms. Sloan,

Mystic Aquarium proposes to update the breeding prevention plan that NMFS on December 23, 2020, approved for Permit No. 22629 by providing for the use of contraception as an alternative to gender separation. Under this update, contraception as well as gender separation would both be available options in situations where the female belugas covered by the permit are not reliably cooperating with ultrasounds designed to monitor the ovaries for follicular development. Permit condition B.6.e authorizes both contraception and gender separation, however, the breeding prevention plan states that Mystic will seek a further approval from NMFS if it desires to use contraception, as opposed to gender separation, if a female does not participate in ultrasound.

On April 15, 2022, NMFS granted Mystic a temporary approval to utilize contraception for the beluga Sahara due to circumstances described in Mystic's April 14, 2022 email to NMFS. As Mystic suggested, NMFS directed that Mystic follow up that email and the temporary approval Mystic provided by submitting a more detailed application for a breeding prevention plan amendment. This letter is that follow-up application, providing further detail and discussion.

[Update regarding Sahara and the contraceptive use authorized in NMFS's April 15, 2022 email.](#)

In its April 14, 2022 email, Mystic explained that its belugas had been doing well with the breeding prevention plan, performing ultrasounds to monitor follicular activity, and gating separately if they will not perform the ultrasound until last week. However, starting approximately April 9, 2022, Sahara's behavior became increasingly distracted, and she was no longer performing her ultrasounds. In accordance with our breeding prevention plan and the permit, Sahara was gated separate from the male in the habitat. While we did not think she was actively cycling (and do not think she is actively cycling now), by default we must keep females cared for under the permit separate from any male in the habitat when they will not do the ultrasound.

The gender separation became longer than anticipated because Sahara continued to decline to participate in the ultrasound behavior. The separation was unwelcomed to Sahara, who had to be separated from both the male and another female beluga (a female not covered by the permit) who remained with the male so that he has companionship. All the animals became intensely focused on each other, to the distraction of their daily routine. Given this situation, the focus had to be on delivering food, without much ability to work on and maintain training behaviors needed for medical husbandry purposes. Most of the animals were not doing their husbandry behaviors reliably. Most were getting full diet, but, significantly, Sahara was short on April 12, 13

and 14, 2022, receiving 95% or less of her diet. She was not willing to do behaviors as she is focused on the location of the other animals. We realized that if this situation persisted for more than a short time, both the inability to conduct routine health monitoring through husbandry behaviors on her and the other belugas and the reduction in her diet would be concerning.

After receiving NMFS's April 15 email temporarily authorizing use of contraceptives for Sahara, Mystic started Sahara on the contraceptive Altrenogest (Regumate) at 0.044mg/kg orally once daily. Mystic then waited 24 hours and terminated the gender separation during the weekend of April 16-17. The social disruption issues resulting from the gender separation dissipated within 36 hours after we ended the gender separation. Sahara is now eating her full diet, and we are seeing immediate improvements in the willingness of she and the other belugas to voluntarily engage in necessary medical care and husbandry behaviors.

Application for amendment to breeding prevention plan.

Mystic now proposes to amend the breeding plan on a permanent basis by obtaining approval for contraception being an option along with gender separation, in any situation in which the female belugas covered by the permit (Kharabali and Jetta as well as Sahara) are not voluntarily engaging in their ultrasounds (to monitor the ovaries for follicular growth), or in which Mystic for any other reason believes pregnancy prevention steps are necessary.

For Sahara, the reason for continuing contraceptive is to prevent a recurrence of the situation over the last two weeks described above – a situation that improved immediately when we began contraceptive use. Kharabali has been continuing to participate in ultrasounds, but we would like authority to use contraception with her if necessary. She could at some point cease voluntarily participating in ultrasounds, and she too might not react well to gender separation. Jetta is presently separated for medical care, but we are hopeful of returning her to the rest of the population, at which point she would also benefit from having the same array of pregnancy prevention alternatives that we propose for Sahara and Kharabali. Situations can arise quickly. It is best to update now the breeding prevention plan to provide a contraceptive option, before another time-sensitive situation develops, as opposed to coming to NMFS only after a situation develops.

Sahara now (and, if applicable, Kharabali and Jetta in the future) would receive Altrenogest (Regumate) at 0.044mg/kg orally once daily, administered in the fish diet.

Altrenogest is an oral progestin that suppresses estrus or ovarian cycling in females and has been utilized extensively as the primary methodology for contraception in cetaceans in managed care for over 20 years (Robeck et al 2018). As long as the female beluga had recently participated in an ultrasound showing no cycling or pregnancy, or the absence of cycling or pregnancy had been confirmed by some other means, the female beluga covered by the permit would be mixed with the rest of the pod 24 hours after the initial administration of this contraceptive. Once the animal is started on the medication, she would be monitored with blood samples for hormone analysis (estrogen and progesterone) every 6 weeks.

Altrenogest has been utilized frequently in cetaceans for multiple indications and is considered both rapidly reversible and safe with no documented adverse effects. No adverse effects are expected in Sahara (or if eventually applicable, Kharabali or Jetta) with use of this medication; however, the animal(s) will be monitored closely and medication would be ceased immediately if any adverse reaction is noted, and the animal would again be separated physically from the male in that case. Given that the medication has a short duration of action, it is unlikely any unexpected reaction would persist longer than 24 hours.

The most common indications of use include contraception and estrus synchronization for timing of artificial insemination (Robeck et al 2005, Young et al 1996). In three studies of cetaceans administered Altrenogest up

to 77 days, including 27 bottlenose dolphins and 4 pacific white sided dolphins between the studies, no adverse effects were documented, and the animals returned to reproductive activity rapidly with increased estrogen and sexual activity by day 4, and ovulation by day 20-21 following discontinuation of the medication (Sanchez et al. 2005, Menchaca et al 2007, Robeck et al 2005). While the objective of contraception use in Sahara is intended for short-term use only, previous reports have documented use in cetaceans for multiple years, specifically two and five years in bottlenose dolphins without adverse effects (Menchaca et al 2007). Despite the medications demonstrated safety in cetaceans, if an adverse reaction to the medication was suspected the medication would be discontinued immediately. Licensed veterinarians would respond to any event with the highest quality medical care.

The objective of the contraception is for short-term to medium-term use, while Mystic establishes what is optimal for breeding prevention based on voluntary husbandry behaviors, health, and overall pod management. The animal husbandry team would continue to work with Sahara (and, if applicable Kharabali and Jetta) to rebuild her/their behavioral ovarian ultrasound criteria with the goal of returning to routine voluntary ultrasound monitoring. If the animal is able to be monitored for 6 weeks continuously with ultrasound, then the oral contraception could be discontinued, and breeding prevention would be managed with regular ultrasound examinations performed by a licensed veterinarian. If the animal's behavioral ultrasound is unable to be relied upon for reproductive management or if it is determined to be in the best interest of the whales' health and pod management, the animal would remain on the contraception medication through the end of breeding season (through June 30, 2022). However, since belugas have been found to ovulate occasionally outside of breeding season (Robeck et al 2005) then oral contraception may be utilized as needed outside of breeding season, as determined by licensed veterinarians, to prevent reproduction.

This request would apply for the remainder of the term of the permit, but Mystic will review progress and report to NMFS as appropriate. The Beluga Health Committee at Mystic Aquarium will meet in early Fall 2022, following the conclusion of breeding season 2022, and revisit animal behaviors and outcomes to determine whether request for an additional amendment will be proposed for the 2023 breeding season.

Sincerely,



Allison D. Tuttle, DVM, Diplomate American College of Zoological Medicine
Senior Vice President, Chief Zoological Officer

Cc: Catherine Marzin
Kimberly Damon-Randall
Stephen M Coan

References:

Robeck TR, O'Brien JK, Atkinson S. 2018. Reproduction. In Frances M. D. Gulland, Leslie A. Dierauf, Karyl L. Whitman (Eds.) CRC Handbook of Marine Mammal Medicine. 3rd Edition. CRC Press (Taylor & Francis), Boca Raton, Florida, USA. pp. 1,69 -207.

Robeck TR, Monfort SL, Calle PP, Dunn JL, Jensen E, Boehm JR, Young S, Clark ST. Reproduction, growth and development in captive beluga (*Delphinapterus leucas*). *Zoo Biology*. 24: 29-49. 2005.

Young SJF & Huff DG 1996 Fertility management in a female killer whale (*Orcinus orca*) with altrenogest (Regu-mate). *Proceedings International Association of Aquatic Animal Medicine* 1996.

Robeck TR, Yoshioka M, Jensen E, O'Brien JK, Katsumata E, Gili C, McBain JF, Sweeney J, Monfort SL. Estrus cycle characterization and artificial insemination using frozen-thawed spermatozoa in bottlenose dolphin (*Tursiops truncatus*). 2005. *Society for Reproduction and Fertility*. ISSN 1470-1626.

Sanchez RO, Bossart GD, Lopez AI, Bernal J, Herrera JA. Reproductive activity post- treatment with Alternogest in *Tursiops truncatus* females. *Proceedings International Association of Aquatic Animal Medicine* 2005.

Menchaca MM, Rose R, Gorman H, Graff S. Regu-Mate in reproductive management: a synchronizing project using Regu-mate in six cetaceans results in five ovulations at a specific time with two subsequent pregnancies. *Proceedings International Association of Aquatic Animal Medicine*. 2007.

Permit No. 22629: NMFS Questions for Mystic Aquarium on the April 20, 2022, Request for Approval - Beluga Breeding Prevention Plan Update (May 5, 2022)

1. Regarding ultrasound monitoring, please confirm that you plan to follow the protocols Mystic Aquarium outlined on p. 2 of the December 1, 2020, plan to prevent breeding, as conditioned by the December 23, 2020 NMFS approval. This includes conducting ultrasound:
 - a. Weekly beginning in January each year,
 - b. Twice weekly in February each year, and
 - c. Three times weekly once a follicle is >3mm.

Answers:

a-c) Correct, for the whales not on contraception, their breeding prevention will continue as previously stated in the breeding prevention plan as follows.

Veterinarians will utilize ultrasound to monitor follicular growth in females of reproductive age (age 6 and beyond) during the breeding season.¹ Weekly ultrasound monitoring of each reproductively mature female beluga will begin in January of each year to ensure any early follicular development is identified. In February of each year, ultrasound frequency will increase to twice weekly (corresponding with the start of breeding season). Once a developing follicle (i.e., a follicle > 3mm, which is 0.3 cm) is observed on ultrasound, the female beluga will receive ultrasounds a minimum of 3x weekly to monitor follicular growth to ensure physical separation prior to when the follicle reaches pre-ovulatory size. As pre-ovulatory follicles in beluga average 2.9cm (range 2.4- 4.2cm), precautionary physical separation of females will occur when a developing follicle measures > 1.8cm. This will ensure physical separation well in advance of a follicle reaching pre-ovulatory size. Once physically separated, reproductive ultrasounds will continue at a minimum of 2x weekly until ovulation or resorption occurs. Once ovarian cycling is confirmed complete via ultrasound the females can rejoin the social group. The attending veterinarian may also use blood sampling for hormone analysis as needed for monitoring health.

2. The December 1, 2020 plan further stated on p. 2 that once a follicle is 1.8 cm, gender separation will occur. And, once separated, ultrasound will be done a minimum of twice weekly until ovulation or resorption. According to the December 1, 2020 plan and the December 23, 2020 NMFS approval, once ovarian cycling is confirmed complete via ultrasound, the females may rejoin the adult male no sooner than three days after ovulation or resorption.
 - a. Please confirm this protocol will still be followed for whales that are not on contraception.
 - b. For whales that are on contraception, will this ultrasound monitoring still be conducted (also see #3 below)?

Answers:

- a) The whales that are not on contraception will continue with ultrasound monitoring as previously described, as follows; As pre-ovulatory follicles in beluga average 2.9cm (range 2.4- 4.2cm), precautionary physical separation of females will occur when a developing follicle measures ≥ 1.8 cm. This will ensure physical separation well in advance of a follicle

¹ Mystic's breeding prevention plan submitted to NMFS on December 1, 2020 starts ultrasounds of females at age 7. In its December 23, 2020 letter approving the plan, NMFS stated that reproductive monitoring would start age 6.

reaching pre-ovulatory size. Once physically separated, reproductive ultrasounds will continue at a minimum of 2x weekly until ovulation or resorption occurs. Once ovarian cycling is confirmed complete via ultrasound the females can rejoin the social group. The attending veterinarian may also use blood sampling for hormone analysis as needed for monitoring health.

- b) Whales that are on Altrenogest (Regu-Mate) will be monitored with blood hormone levels and/or ultrasound every 6 weeks.
3. On p. 2 of your April 20, 2022 request, you state that “As long as the female beluga had recently participated in an ultrasound showing no cycling or pregnancy, or the absence of cycling or pregnancy had been confirmed by some other means, the female beluga covered by the permit would be mixed with the rest of the pod 24 hours after the initial administration of this contraceptive. Once the animal is started on the medication, she would be monitored with blood samples for hormone analysis (estrogen and progesterone) every 6 weeks.”
- When you say “had recently participated in an ultrasound,” do you mean following the protocols for frequency described in #1 above?
 - Please clarify what “confirmed by some other means” refers to.
 - When you state that animals on contraceptives will be monitored with blood samples for hormone analysis (estrogen and progesterone) every 6 weeks, is this in addition to ultrasound?

Answers:

- When placing an animal on birth control it is standard practice to first confirm that the animal has no evidence of a large follicle or pregnancy at the time they start on the medication, so a single ultrasound can be performed to confirm the animal is suitable to start the treatment.
- Additional means of confirming that the animal is not cycling or pregnant include analyzing blood hormone levels. That step could be utilized in conjunction with ultrasound.
- Blood hormone and/or ultrasound monitoring will be performed to monitor animals on contraception for ongoing screening of reproductive activity.

4. Regarding gender separation, the request states contraception would be an alternative to gender separation, but that both would be available options if females are not reliably participating in ultrasound. Please clarify. For example, if an individual whale is on contraception, will gender separation not be used with that whale?

Answer:

If a whale is on contraception, then gender separation would not be necessary. Gender separation would be utilized for whales not on contraception if they are not participating in ultrasound or if a large follicle is identified on ultrasound as described in the breeding prevention plan. Note that whales who have been gender-separated will still have ultrasounds twice weekly until ovulation or resorption occurs. See answer to question 2a above.

5. Regarding the use of contraception as needed outside of the breeding season, please describe what monitoring (type and frequency) you would conduct outside of the breeding season to make the determination that contraception is needed.

Answer:

Since belugas have rarely been found to ovulate outside of breeding season (Robeck et al 2005), then ovarian ultrasound exams and/or hormone analyses will be performed as deemed appropriate by the veterinarian to monitor for follicular activity outside of breeding season. If animals are found to have ovarian activity, then the animals will be either placed on oral contraception or ultrasound monitoring will be performed as previously described by the breeding prevention plan.

Robeck TR, Monfort SL, Calle PP, Dunn JL, Jensen E, Boehm JR, Young S, Clark ST. Reproduction, growth and development in captive beluga (*Delphinapterus leucas*). *Zoo Biology*. 24: 29-49. 2005.

6. Regarding the use of contraception in Jetta, and any of the whales if they become ill, please clarify that the whales would be deemed clinically healthy (as determined by blood work, behavior, and the attending veterinarian) before the contraception would begin.

Answer: Contraception, or any medication/supplement for that matter, would only be utilized in a cetacean if the veterinarian determined that the medication would pose no health concern to the animal. Contraception has not been found to be contraindicated in cetaceans undergoing medical care, furthermore there are no established blood or clinical markers described that are necessary before an animal can start on contraception. However, if a circumstance arises in which contraception is felt to be detrimental to an animal, then the attending veterinarian would ensure the animal was gender separated or monitored with ultrasound instead of being placed on oral contraception.

7. What will you do if a whale becomes ill (which may or may not be related to the contraceptive use) while on contraceptives?

Answer: As is standard practice in veterinary medicine, the veterinarian will evaluate every case in its entirety where an animal becomes ill. This means that every aspect of the animal's care is evaluated including environmental, behavioral, nutritional, medical, and including the use of contraception. Likewise, any cetacean becoming ill while on altrenogest (Regu-Mate) will be fully evaluated for the appropriateness to continue contraception or the need for implementing one of the other means of breeding prevention (separation, ultrasound monitoring). Adverse effects have not been reported in cetaceans on oral contraception (altrenogest/ Regu-Mate). Therefore, most commonly oral contraception is continued on cetaceans even if they are under treatment for other medical conditions. However, many elements of the animal will be evaluated such as, will the animal participate in voluntary husbandry behaviors (for example ultrasound or blood sampling for reproductive monitoring), the need to keep the animal in social groupings, any potential drug interactions between medications for treating the illness and the contraception, or the types and frequency of treatments required to fully evaluate which preventative measure is best for the animal in question.

Mystic Aquarium's Responses to NMFS' September 26, 2022 Request for Additional Information Pertaining to Permit No. 22629 - Beluga Breeding Prevention Plan Update

(Responses dated: September 30, 2022)

NMFS's questions are reprinted in black text and Mystic Aquarium's responses are in blue text.

Briefly summarize (e.g., no more than one or two paragraphs) the health and behavioral status of Jetta, from April 2022, to present. Include her mentation, body condition (including weights or other measurements), appetite and diet, medical treatments, and husbandry behaviors reliably performed during this time period including when she was moved.

In late April to early May 2022, Jetta developed a low neutrophil count. She was treated with antibiotics and a medication to stimulate her neutrophils, and this resolved the issue. Since then, Jetta's medical status has greatly improved. She is currently off all medications, has been reintroduced to the Arctic Coast beluga habitat, and she has successfully been reintroduced to all other beluga whales. Jetta has a resolving lung nodule, which at last exam (September 22, 2022) has reduced from a distinct nodule to more of an indistinct lesion (indicative of nodule resolving). We continue to monitor her for anemia and low serum iron; however, her white blood cell count and other blood parameters continue to be within normal ranges, and she is clinically well, eating and behaving normally. Ultrasound and blood parameter rechecks are being performed at a minimum of every 2-4 weeks as deemed appropriate by veterinarians to continue to monitor health and reproductive status. Jetta's overall condition and status remain stable, and she is actively interacting with husbandry staff, enrichment, and the other beluga whales.

From April 1 to September 27, 2022, Jetta's body weight (BW) and axillary girth (G) measurements steadily increased from 326.2 kg BW/159 cm G to 340.2 kg BW/ 163 cm G. The training staff retrained Jetta to accept and swallow whole fish, with her caloric intake stabilizing in July. She continued to eat readily and has steadily increased her intake to 13,500 kcal. On July 7, 2022, Jetta started sitting up, taking food without assistance, and stationing. From July 7 to August 11, 2022 Jetta recovered the following trained behaviors – hand target, target pole, vertical stationing, response to start of session, mouth tactile, spin, no, yes, pec presents, and dorsal layouts. She was also trained new behaviors to prepare her for reintroduction to the Arctic Coast habitat complex and the beluga pod (gastric tube, gating, and A to B behavior). She was moved to Arctic Coast habitat on August 12, 2022. She was acclimated to the medical pool and holding pools allowing visual introduction to all the belugas. Upon moving, she immediately stationed and ate readily. To date Jetta has recovered most of her previously trained behaviors, has been introduced to the other beluga whales and shifts variably to the main pool, medical pool, and holding pool.

Summarize any changes in Kharabali and Sahara's health status since April 2022 and describe any noted reactions (physical and behavioral) from contraceptive use in Kharabali and Sahara to date and how the contraceptive use impacted Juno's behavior toward these two females.

The bloodwork of Kharabali and Sahara showed mild to moderate systemic inflammatory processes in May 2022, following the administration of their *Erysipelas* vaccines. Both animals' inflammatory markers fully resolved with systemic antibiotics and antifungal medication. In June-

July 2022, Sahara developed a low neutrophil count. Following administration of a medication to stimulate neutrophils, the low neutrophil count fully resolved and has not reoccurred. There are no other changes in the health status of these whales in this period. Behaviorally, these two whales have remained normal throughout this period. They are active and interact well with the other whales.

We have not seen any adverse reactions or effects in either whale from being on oral contraception. Furthermore, we have not seen any adverse response in Juno's behavior to either of the whales while on or off oral contraception. Social interactions between all whales continue to be normal.

Describe if any additional modifications to the breeding prevention plan are warranted with the addition of contraceptive use for the duration of the permit. If the Mystic Aquarium Beluga Health Committee has not yet met, please let us know when you expect to meet.

The submitted amendment, allowing flexibility for reproductive monitoring via ultrasound with separation and/or contraceptive medication, as determined by the Attending Veterinarian, is what is thought to be needed to effectively prevent breeding in the three whales (Sahara, Kharabali, and Jetta) while offering the most flexibility in terms of animal management to maximize the welfare of the whales. Additional modifications are not anticipated at this time.

Mystic Aquarium's IACUC Beluga Health Committee convened on August 23, 2022 and reviewed the Breeding Prevention Plan (including proposed amendments submitted to NMFS). The committee fully supported the plan as suitable for prevention of breeding in these whales.