

## IPRenewal NPEmails

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**From:** Stuyvenberg, Andrew  
**Sent:** Thursday, June 30, 2011 2:31 PM  
**To:** Gray, Dara F  
**Cc:** IPRenewal NPEmails; Balsam, Briana; Logan, Dennis; Imboden, Andy; Turk, Sherwin  
**Subject:** FW: nmfs questions re. IP thermal  
**Attachments:** questions re. IP thermal.docx

Dara - This e-mail forwards Julie Crocker's requests concerning shortnose sturgeon and thermal effects. You'll note that this document contains two categories of requests. The first paragraph contains information NMFS expects to see in NRC's BA supplement, while the remainder of the document contains questions that NMFS indicates relate to the 2011 Swanson et al. report.

Julie's e-mail, below, includes Julie's availability this week and next for a teleconference, if necessary.

Please contact me if you have any questions. I will be in the office until 4:45p today, out of the office tomorrow, and in next week Tuesday through Friday.

Best,  
Drew

-----Original Message-----

From: Julie Crocker [<mailto:Julie.Crocker@Noaa.Gov>]  
Sent: Thursday, June 30, 2011 2:05 PM  
To: Imboden, Andy  
Cc: Stuyvenberg, Andrew; Balsam, Briana; Logan, Dennis; Julie Williams; Mark Murray-Brown  
Subject: nmfs questions re. IP thermal

Hi all -

Attached are NMFS questions related to the Swanson 2011 thermal plume report and a summary of what we anticipate that NRC would consider in the supplement to the BA. Please forward to Entergy as appropriate. I am in the office until 3:30 today, in 8-12 tomorrow and then only in Tues and Weds next week, but will be checking email throughout - if NRC or Entergy has any questions regarding this I'm happy to have a call, etc.

Thanks and enjoy the long weekend!

Julie

**Hearing Identifier:** IndianPointUnits2and3NonPublic\_EX  
**Email Number:** 2718

**Mail Envelope Properties** (AF843158D8D87443918BD3AA953ABF782B680FF52F)

**Subject:** FW: nmfs questions re. IP thermal  
**Sent Date:** 6/30/2011 2:30:59 PM  
**Received Date:** 6/30/2011 2:31:01 PM  
**From:** Stuyvenberg, Andrew

**Created By:** Andrew.Stuyvenberg@nrc.gov

**Recipients:**

"IPRenewal NPEmails" <IPRenewal.NPEmails@nrc.gov>  
Tracking Status: None  
"Balsam, Briana" <Briana.Balsam@nrc.gov>  
Tracking Status: None  
"Logan, Dennis" <Dennis.Logan@nrc.gov>  
Tracking Status: None  
"Imboden, Andy" <Andy.Imboden@nrc.gov>  
Tracking Status: None  
"Turk, Sherwin" <Sherwin.Turk@nrc.gov>  
Tracking Status: None  
"Gray, Dara F" <DGray@entergy.com>  
Tracking Status: None

**Post Office:** HQCLSTR02.nrc.gov

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	1432	6/30/2011 2:31:01 PM
questions re. IP thermal.docx	16856	

**Options**

**Priority:** Standard  
**Return Notification:** No  
**Reply Requested:** No  
**Sensitivity:** Normal  
**Expiration Date:**  
**Recipients Received:**

## **Shortnose sturgeon and I.P. Thermal Plume – NMFS Questions 06-30-11**

In the Biological Opinion, NMFS will need to make a determination on the effects to shortnose sturgeon from the discharge of heated water from the Indian Point facility. At this time, we anticipate using the best available information to do the following: (1) describe the thermal plume in terms that are biologically relevant to shortnose sturgeon (temps that could be stressful and/or lethal); (2) determine how the thermal plume will affect individual shortnose sturgeon (will they avoid the heated area or a portion of it, or can they not avoid it and will be exposed to effects while swimming through it); (3) if shortnose sturgeon are likely to avoid the plume - determine what the effect of this avoidance behavior will be (how far “out of their way” would sturgeon need to go to avoid the heated water and what effect would this have on individuals); (4) if the plume cannot or will not be avoided what is the effect of the exposure (physiological stress (does this have any impact on fitness of individuals?), injury, mortality), and, (5) does the discharge affect the ability of shortnose sturgeon to carry out essential behaviors in the action area (foraging, resting, migrating – no spawning or rearing of early life stages occurs in the action area). NMFS expects that the NRC’s supplemental BA will consider all of the above.

NMFS has reviewed the Swanson et al. (2011) report on the triaxial thermal plume study and also understands that NYDEC has reviewed the report and other available materials and has determined that water temperatures will only exceed 90°F in an area no greater than 75 acres, and at times when ambient temperatures are greater than 83°F the thermal plume will not cause an increase in temperature greater than 1.5°F except within this 75 acre mixing zone. NMFS has the following remaining questions:

- At what distance from the outfall do temperatures return to ambient?
- It is NMFS understanding from the Swanson report that the thermal plume is present only at the surface of the river. Page ii of the report notes that temperatures greater than 90°F were observed at a 4-ft depth for three stations closer to the discharge and at one station closest to the discharge (down to 15 feet). At what distance from the outfall are these stations located and how deep is the water at these stations? What were the maximum temperatures recorded at these depths? At what distance from the surface is the plume no longer detectable? What are water depths in this area?
- Are there any anticipated effects to shortnose sturgeon prey (largely benthic invertebrates) from the discharge of heated effluent or are these species always outside of the area of influence of the thermal plume?
- 28.7°C (83.66°F) has been identified as the upper safe thermal limit for shortnose sturgeon (Ziegweid et al. 2007). Field information suggests that shortnose sturgeon are likely to avoid areas with temperatures greater than 28°C (82.4°F). Please describe the area where temperatures greater than 28°C will be experienced.
- 33.7°C (92.66°F) has been identified as the temperature at which shortnose sturgeon will lose equilibrium and has been described as the critical thermal maximum for shortnose sturgeon (Ziegweid et al. 2007). The lethal temperature for shortnose sturgeon is described in Ziegweid et al. (2007) as 34.8°C (94.64°F). Please describe any areas where water temperatures will meet or exceed these temperatures.

- p. 62 of the Swanson report describes the maximum temperatures measured at the discharge as ranging from 94°F – 103°F. Is it reasonable to consider that the time period captured (July – mid August 2010) is representative of the maximum temperatures that would be expected over the extended operating period? The information on p. 62 also seems to indicate that temperatures at thermistor station 25 reached 95.1°F. Is this the maximum temperature recorded at any of the measuring stations?
- p. 92 of the Swanson report notes that plant effluent “often exceeded 100°F at the discharge, but such high temperatures were significantly diminished (to approximately 85°F by the time reached station 27, approximately 900 feet from the discharge” and that the influence from the thermal plume was “barely evident” by the western side of the channel. Please describe the temperature conditions at the bottom of the river along these distances; are they ever influenced by the thermal plume? At what distance from the surface does the influence of the plume stop being detectable?
- It is NMFS understanding from reading the Swanson report that the Indian Point plume does not interact with the thermal plume(s) extending from any other power facility, including Bowline. Please confirm that this is an appropriate understanding.
- Does the thermal plume have any effect on dissolved oxygen levels in the river? If so, what effect does that have on shortnose sturgeon which may experience stress at DO levels less than 5mg/l and are less tolerant of high temperatures at decreased levels of DO (see Niklitchek 2001).