20 February 2020

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Department of Planning, Industry and Environment
320 Pitt Street, Sydney NSW 2000

Dear Rose-Anne

Port Kembla Gas Terminal — Modification 1
Response to Department of Primary Industries Fisheries

The below table provides responses to the issues raised in the submission received from Department of Primary Industries Fisheries (C19/696) on the proposed modification of Port Kembla Gas Terminal.

Table 1 Response to Department of Primary Industries Fisheries

Issue	Response
<u>Entrainment of marine biota</u> The submission requests an assessment of the potential for entrainment of marine biota through the water intake structures of the FSRU, including the potential scale of potential impacts, approach velocity near the intake, and mitigation measures.	The operation of the FSRU is not likely to cause a significant impact on marine biota, including potential for entrainment, due to the existing condition of the marine environment in the Inner Harbour and the characteristics of the water intake structures of the FSRU. The FSRU and water intake structures have been designed to balance outcomes including intake velocity, risk of entrainment, biofouling, maintenance, vessel draft at berth, and seagoing capabilities. The structures would incorporate meshed strainers to prevent entrainment of marine biota. Design information for the water intake structures and strainers is provided in Attachment A. Discussions with the FSRU supplier have indicated that installing additional retro-fitted strainers would have the potential to affect the handling of the vessel, and would limit the ability to quickly remove the strainers and/or safely navigate away in an emergency situation. The water intake structures would have an opening of about 2.3 m^2, noting the installation of the above meshed strainers, and would be situated at a depth of about 13 m beneath the surface while the vessel is fully loaded.

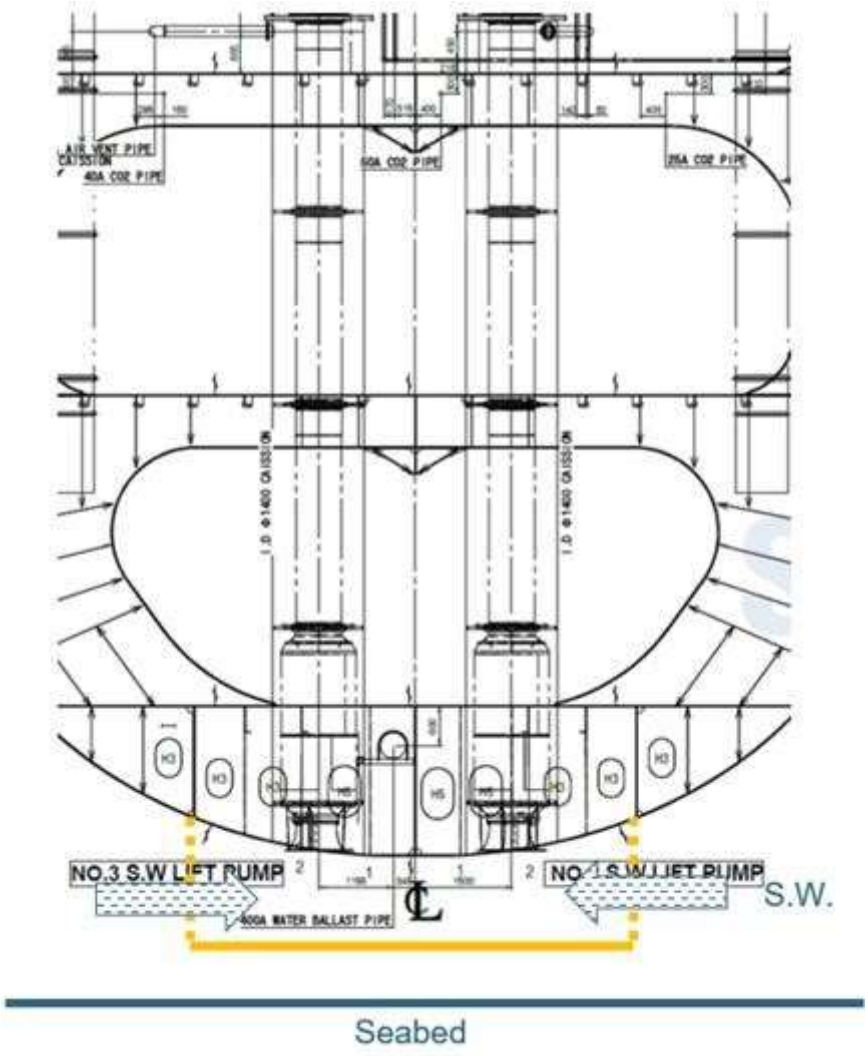
Issue	Response
	The water intake velocities at the openings of the strainers would vary between about 0.39 m/s in the low season and 0.785 m/s in the high season. It should be noted that these velocities supersede those described in earlier responses to submissions which indicated that the maximum intake velocity during high season operations was greater than 0.785 m/s. Since that time, additional information provided by the vessel manufacturer has confirmed that the maximum high season intake velocity is based on the maximum flow capacity of each seawater intake. This means that when the maximum flow capacity of one of the seawater intakes is reached, the FSRU begins using additional seawater intakes, which ensures the intake velocity remains at or below 0.785 m/s at all times. The Inner Harbour is highly developed and subject to ongoing disturbance from various industrial and port activities. The existing marine habitat is limited to hard and soft substrates with biofouling community structures that are reflective of a highly disturbed environment. The fish assemblages understood to be present are common across the region and do not include threatened species. As noted in the EIS, the Inner Harbour in particular is not known to support as many species as the Outer Harbour. Potential impacts on fish species present would be further limited due to the depth of the intake and the tendency for fish species to inhabit shallower parts of the water column due to the availability of light and food. The environmental impact assessment of the Sydney Desalination Plant[1] provides some context concerning the potential impacts of a water intake structures. That facility was assessed as operating at a greater intake volume, being 500 ML/day compared to the 312 ML/day assessed for the proposed modification, and within a substantially more sensitive rocky reef environment at Cape Solander. It was found that the water intake would potentially result in the entrainment of about 2 per cent of

[1] Clark, G., Knott, N., Miller, B., Kelaher, B., Coleman, M., Ushiama, S., Johnston, E. (2018). *First large-scale ecological impact study of desalination outfall reveals trade-offs in effects of hyper salinity and hydrodynamics*. Water Research, 145, 757-768.

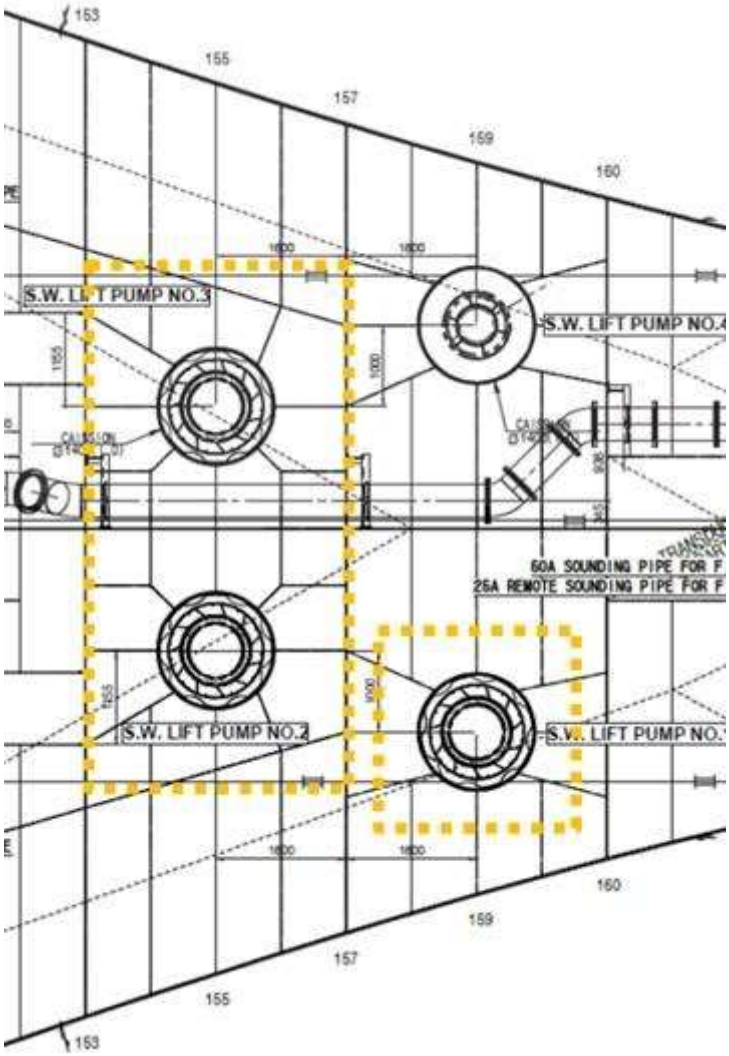
Issue	Response
	the larval population occupying an area surrounding the intake. It is expected that any larval populations that could be potentially affected in the Inner Harbour would be substantially less dense than at Cape Solander. Further, it was found that entrainment associated with the Sydney Desalination Plant would be effectively minimised or eliminated at intake velocities at 0.6 m/s and 0.3 m/s respectively[2]. The predicted intake velocities of the proposed modification would be in the order of these velocities and accordingly would limit entrainment. While there would be some limited risk of impact, the water intake structures would not be expected to have a significant impact on marine biota due to the existing disturbed marine environment and the characteristics of the water intake structures, including their depth.
<u>Design of intake structure</u> The submission requests Department of Primary Industries Fisheries be consulted concerning the design of the water intake structure.	Design information for the water intake structures and strainers is provided in Attachment A.
<u>Monitoring during operation</u> The submission states the Department of Primary Industries Fisheries may request monitoring of the intake system during operation to verify its potential impacts and determine whether further mitigation measures may be required.	We acknowledge the potential request for monitoring of the intake system during operation to verify its potential impacts and determine whether further mitigation measures may be required. We suggest that these requirements be discussed and agreed as part of the ongoing discussions regarding the development of the Water Discharge Quality Verification Program under the existing conditions of approval for the project.

[2] Ibid.

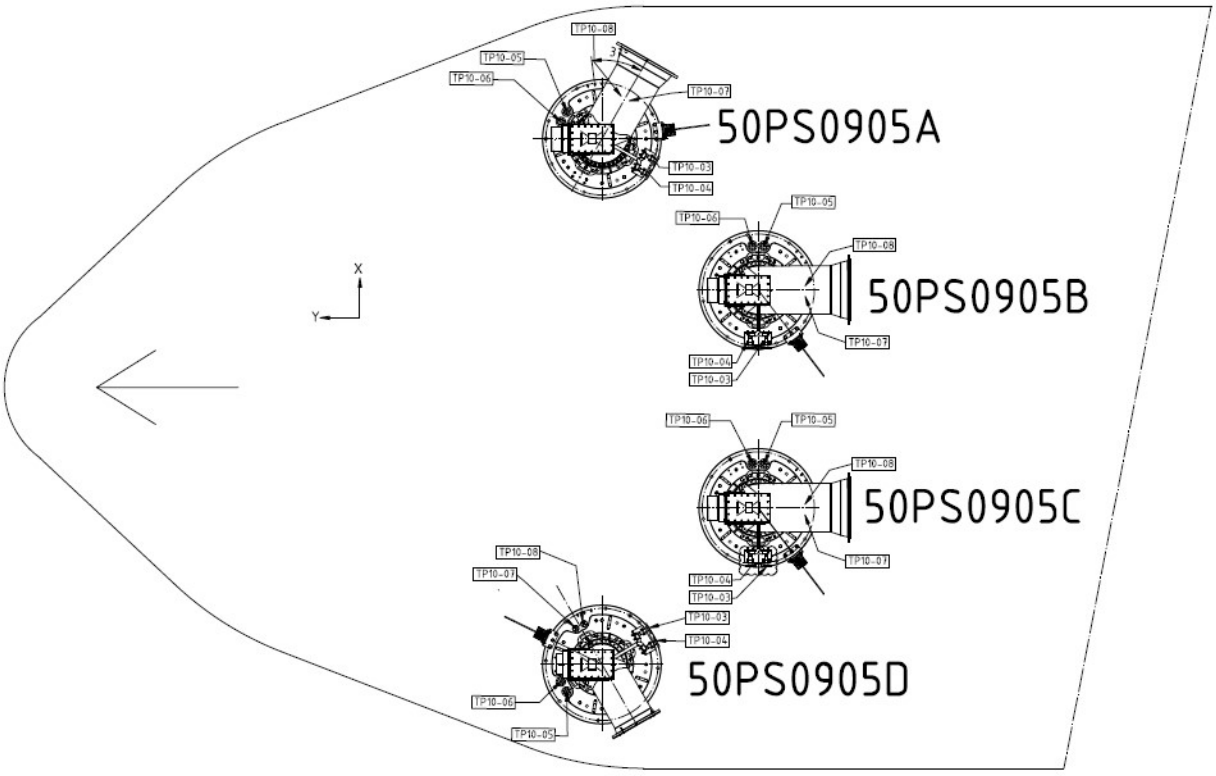
Attachment A — Technical details of water intake structures



FSRU cross section showing location of seawater intakes



FSRU plan view showing location of seawater intakes



General arrangement of seawater intakes

FSRU seawater strainer prior to fitting to each seawater pump (mesh size of 12 x 25mm)