



OUTLETS, SPILLWAYS AND POWER INTAKES

**Professor Philippa Webb
Hearing for the First Phase on
the Merits**

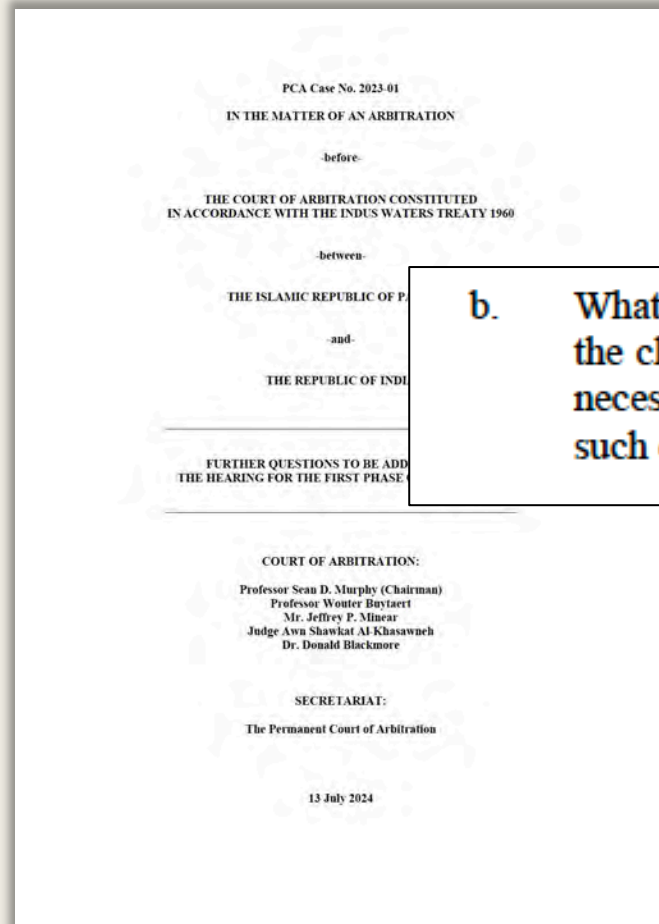
*Indus Waters Treaty Arbitration
(Pakistan v. India)*

PCA Case No. 2023-01

16 July 2024, The Hague



Question 4(b)



b. What is the relationship between the concept of necessity in Paragraphs 8(d) and 8(e) and the choice of the site for a HEP? If an outlet below Dead Storage or a gated spillway is necessary at one site, but not another, is India obligated to choose the site not requiring such elements?

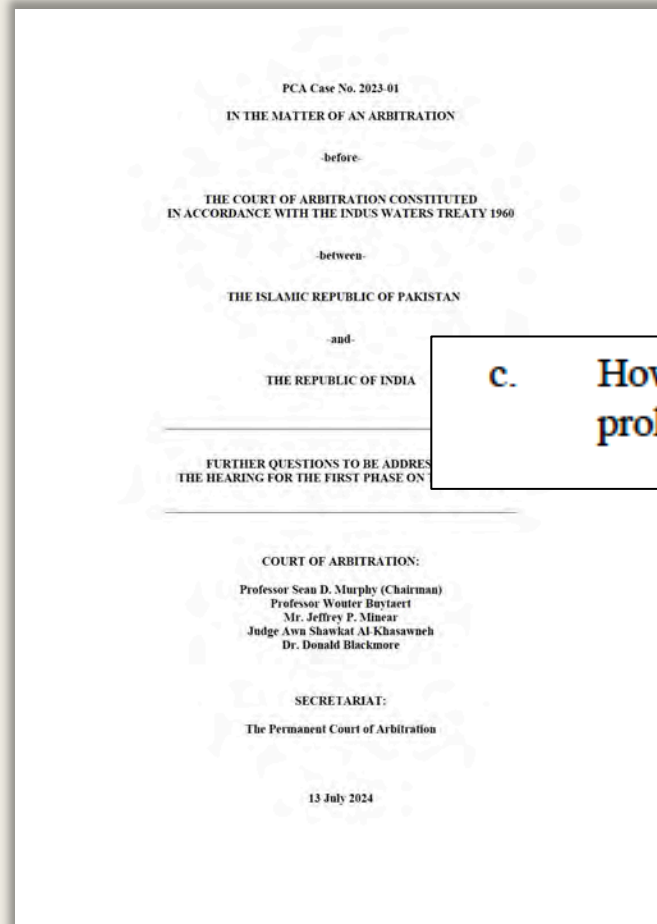
Relationship between necessity and the prohibition on drawdown flushing



Choice of site and design intended for drawdown flushing	Choice of site and design would enable drawdown flushing	Outlets below Dead Storage Level (para. 8(d), Annexure D)	Gated spillway (para. 8(e), Annexure D)
<p style="text-align: center;">PROHIBITED</p>	<p>Site choice is heavily constrained</p> <p>Burden on India to show a plan for sediment management that does not involve drawdown flushing</p> <p>Kishenganga Partial Award, §506</p>	<p>Necessary for sediment control or other technical purpose, excluding sediment control or purpose achieved through depletion of Dead Storage</p>	<p>Necessary due to conditions at the site, excluding depletion of Dead Storage</p>



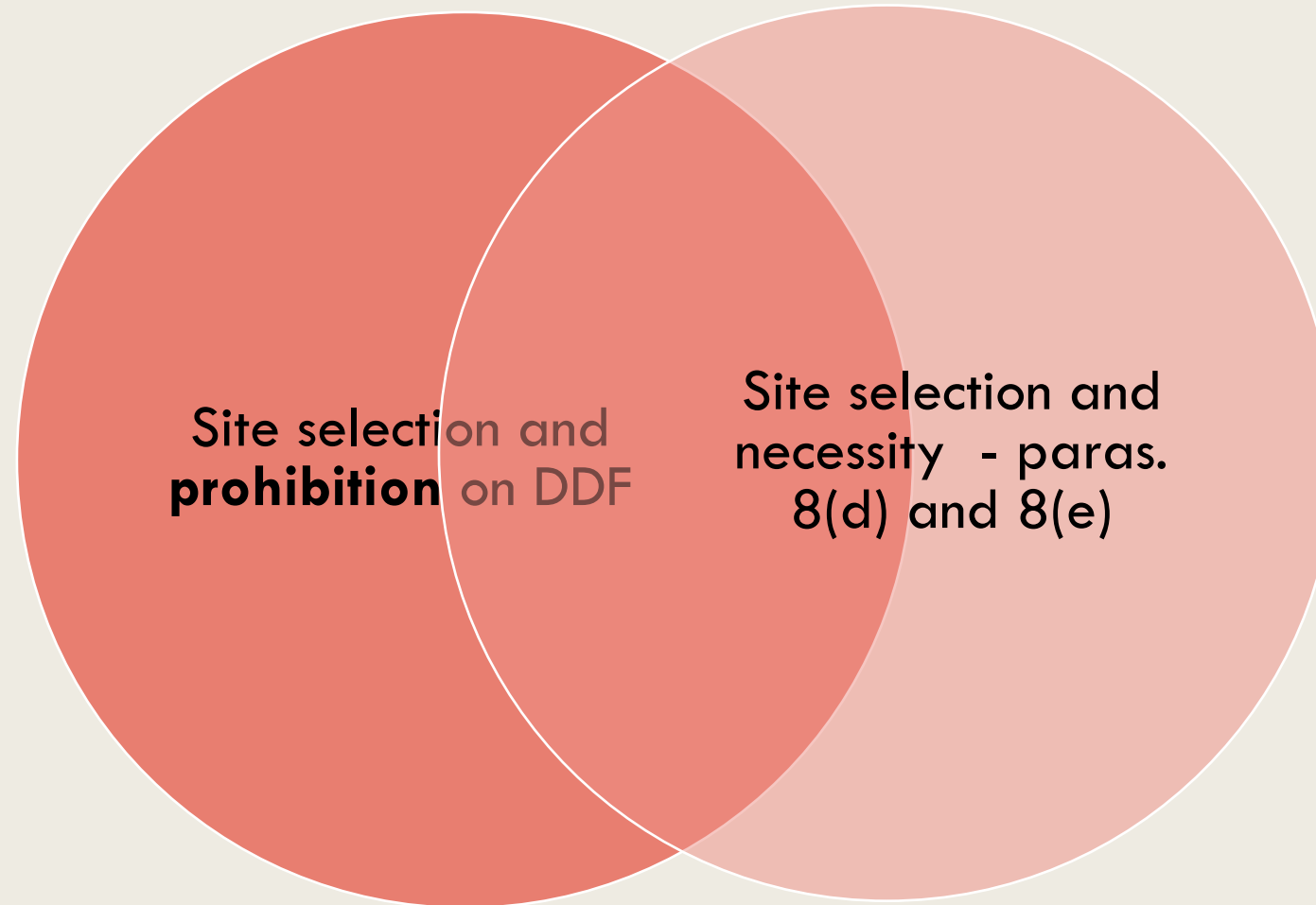
Question 4(c)



c. How does this relationship compare to the relationship between site selection and the prohibition on drawdown flushing found by the *Kishenganga* Court?



Question 4(c)



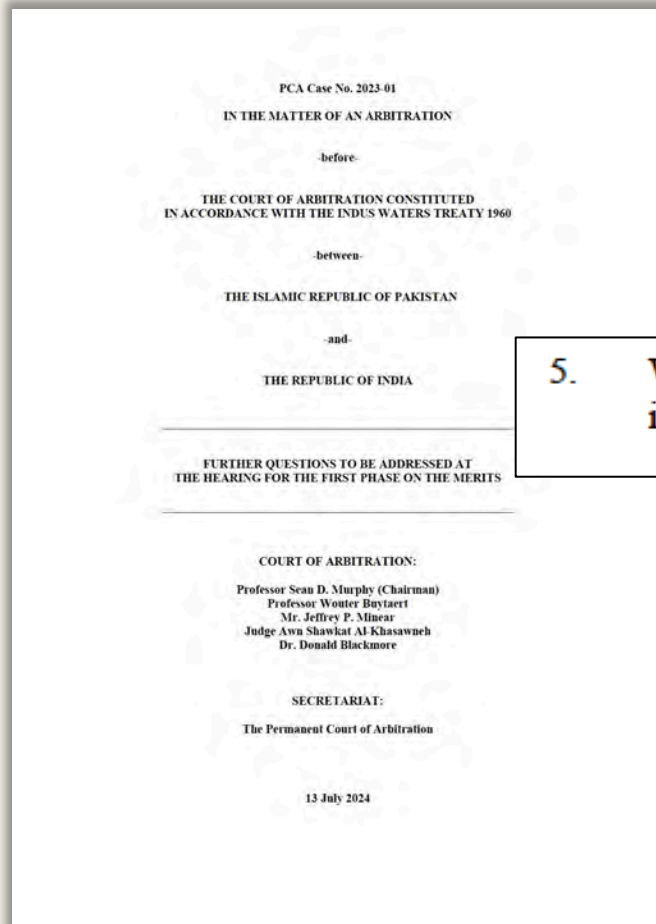


Kishenganga Court on site selection

- Partial Award, §517: India is precluded from having recourse to drawdown flushing; there are a number of other techniques available.
- Partial Award, fn 724: India's inconsistent argument on necessity.
- Partial Award, §519: India's expert failed to examine whether sluicing would suffice.
- Partial Award, §520: Another of India's experts' reports did not exclude other possible designs that could operate on a different basis.
- Clarification Decision, §34: India's choices are to modify its design (even if not most economical) or choose another site.



Question 5



5. With respect to the different ways the concept of best practices is referenced in the Treaty, what is the support for the proposition that doing so refers to international best practices?



Question 5

Ordinary
meaning

Sound and economical;
satisfactory operation;
customary and accepted;
highest level; minimum size

Context

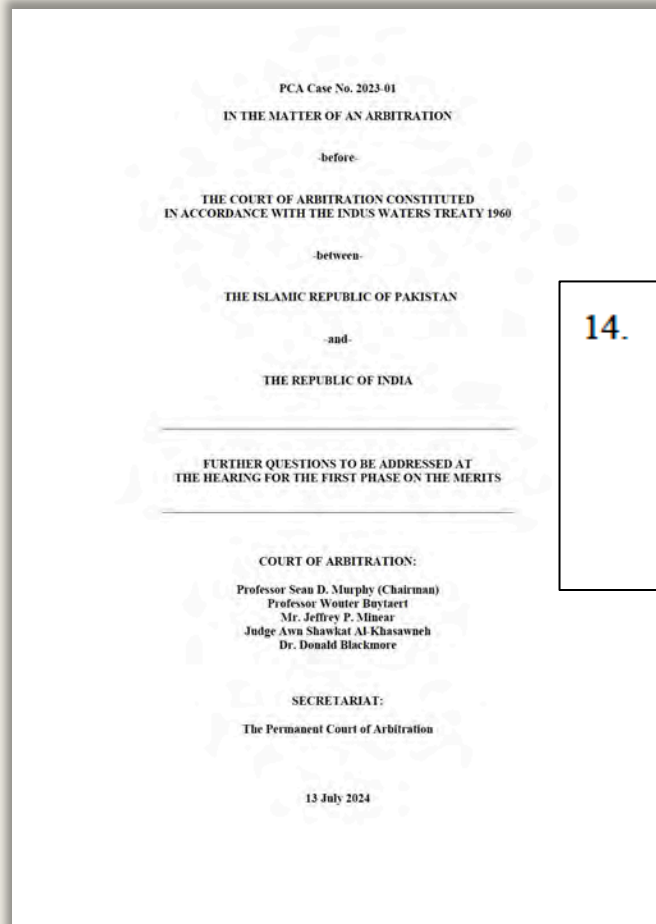
Customary and accepted;
Art IX; Annexure G, para 4;
Annexure G, para 29

Circumstances
of conclusion

International practices; lack
of developed standards in
India and Pakistan



Question 14



14. To what extent is cost a relevant consideration with respect to outlets, spillways, and intakes (*c.f.* Tr., (Day 4) 164:18–20), given the references to “economical design” (Paragraph 8(d)) and “economical construction” (Paragraph 8(f))? And if it is not relevant, how is that consistent with the principle of effectiveness in the law of treaties? Is there a distinction to be drawn between “economical design” (Paragraph 8(d)) and “economical construction” (Paragraph 8(f)) for the purposes of the Treaty?



Paragraph 8(d) Flow Chart

LLO is necessary for sediment management or other technical purpose

Identify options: sound and economical design

Select design that allows for smallest and highest LLO

Satisfactory operation of the works



Paragraph 8(e) Flow Chart

A gated spillway is necessary due to conditions at the site of the Plant

Identify options: sound and economical design

Select design that allows for highest positioning of the bottom level of the gates when closed

Satisfactory construction and operation of the works



Paragraph 8(f) Flow Chart

Identify options: satisfactory and economical

Select design that allowed the highest level intake
in the reservoir

Consistent with customary and accepted practice
of design for designated range of the HEP's
operation

Kishenganga, India's Rejoinder, Schleiss Report, Tab I, 7 May 2012, pp. 4-5



bottom elevation. On the other hand the intake has to have sufficient submergence from the operation level of the reservoir in order to avoid vortex formation and consequently air entrainment into the intake as well as to ensure pressure flow in the headrace tunnel under all operation conditions. Mountain rivers are also subject to heavy floating debris during floods,

during floods. KHEP is a high-head run-of-river power plant and entrainment of sand and excessive suspended sediments into the intake and headrace tunnel has to be avoided from an economical and safe operation point of view in order to limit abrasion of the Pelton turbines as well as deposits in the headrace tunnel which would result in increasing head losses. Normally sand entrainment has to be avoided by desilting basins. Under the local topographic condition of the KHEP it is technically not feasible to design free surface desilting basins. The only but not economical solution would be to place them underground as pressurized desilting chambers. Nevertheless such an arrangement has shown in many projects not to be sufficiently efficient in desilting the water. Therefore in KHEP a minimum reservoir size is essential to guarantee that the sand and a large amount of the suspended fine sediments will settle down during flood season in it. The intake water will then be sufficiently clean for safe and economical operation of



Kishenganga Court

Partial Award, fn 734: “Dr Schleiss states that a submerged intake is required at the KHEP in light of the need to maintain water pressure throughout the head-race tunnel. See Schleiss Report, p. 4 …He further states, without elaboration, that the topographical conditions at the site require the intake to draw water directly from the reservoir itself, rather than by way of a separate weir and desilting basin. See *ibid.*, p. 5 …For the Court, this suffices to establish that the current design of the KHEP may well be the simplest alternative and the use of drawdown flushing the most economical approach to sediment management; it does not establish that these approaches are the only ones available.”

§521: “The Court’s view that India’s right to generate hydro-electric power on the Western Rivers can meaningfully be exercised without drawdown flushing extends beyond the specifics of the KHEP to other, future Run-of-River Plants … the Court presently sees no reason why the factors favouring the feasibility of a sluicing mode of operation at the KHEP site would not apply equally to other sites on the Western Rivers at which India would be likely to construct Run-of-River Plants.”



Economical design v construction

Economical design

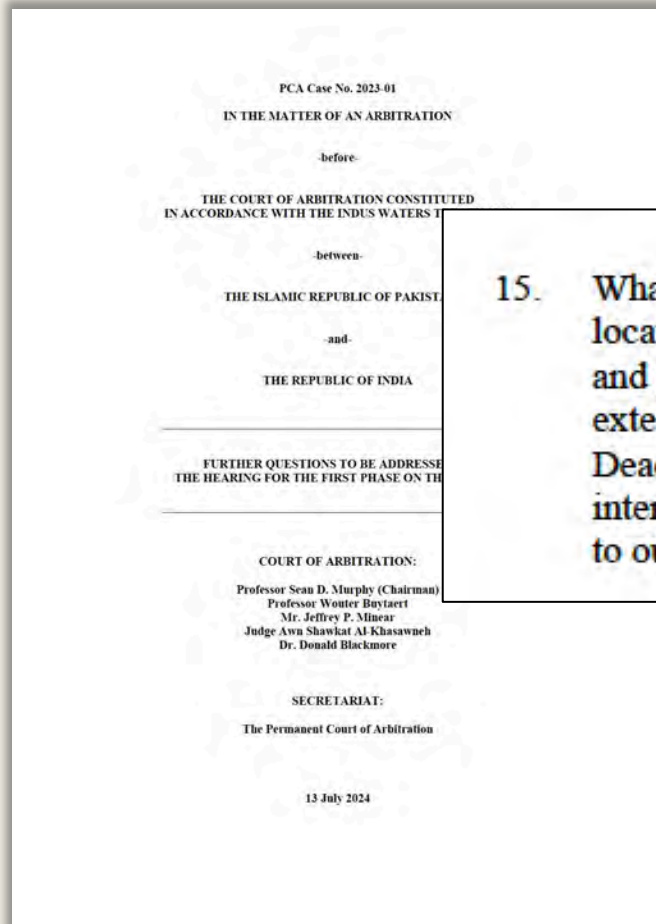
- Fulfil Treaty requirements
- “Shall conform” with Para 8, Annexure D

Economical construction

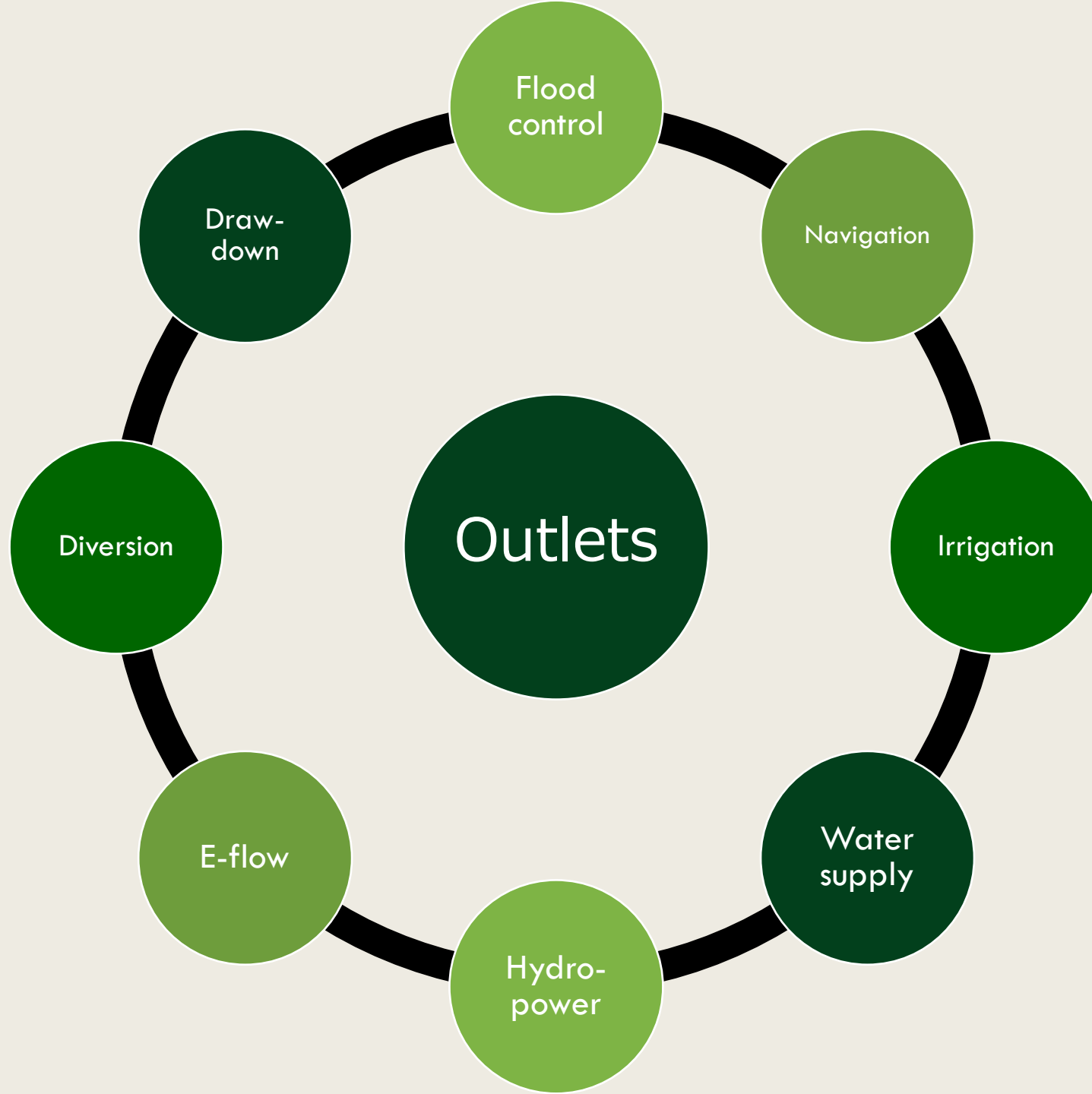
- Para 8(f)
- Practicalities and expense of building



Question 15

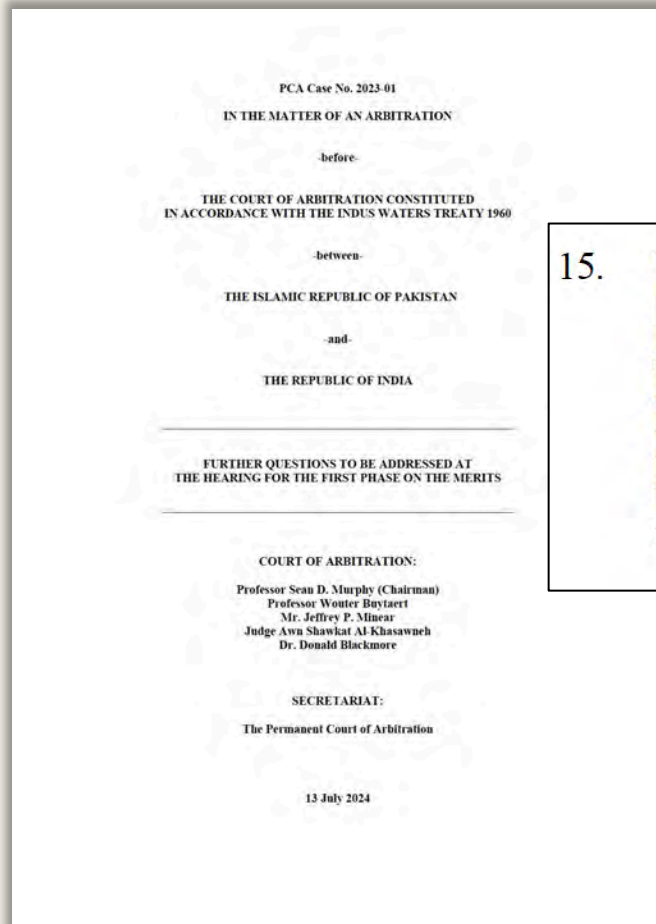


15. What is the universe of outlets regulated by Paragraph 8(d) of Annexure D? Is it limited to outlets located entirely below Dead Storage Level? Or does it also include outlets located partially above and partially below Dead Storage Level (e.g., crest gated spillways or surface intakes)? To the extent that Pakistan maintains that this provision applies only to outlets located entirely below Dead Storage Level (as suggested during Day 4 of the Hearing), what is the basis for this interpretation? Would any difference of significance follow from also applying Paragraph 8(d) to outlets partially below Dead Storage Level?





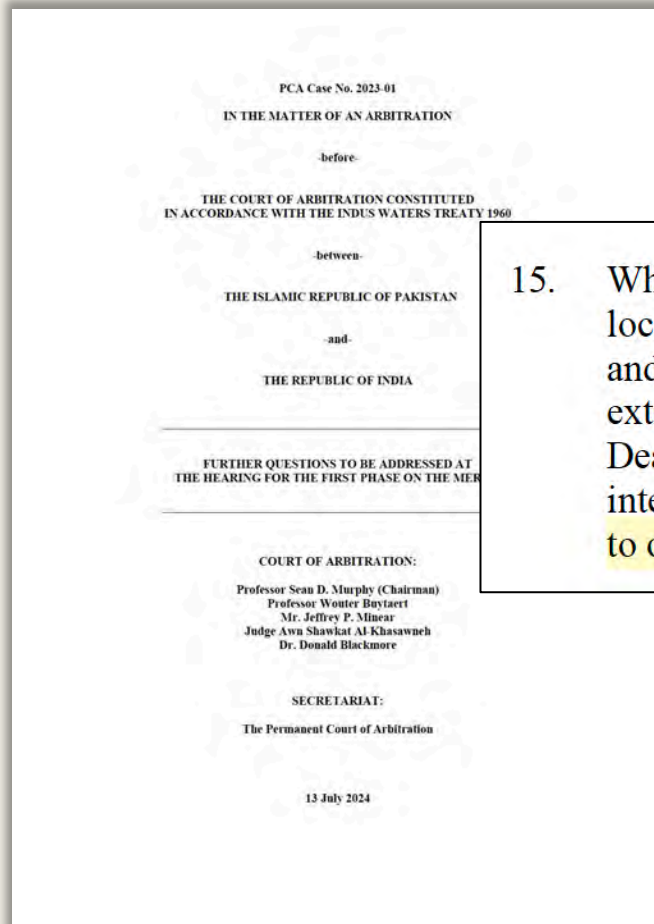
Question 15



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Annexure D, Paragraphs 8(d), (e), (f)

No. 6032

INDIA, PAKISTAN and INTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENT

The Indus Waters Treaty 1960 (with annexes). Signed at
Karachi, on 19 September 1960

Protocol to the above-mentioned Treaty. Signed on 2
November, 2 and 23 December 1960

Official text: English.

Registered by India on 16 January 1962.

INDE, PAKISTAN et BANQUE INTERNATIONALE P
LA RECONSTRUCTION ET LE DÉVELOPPEME

Traité de 1960 sur les eaux de l'Indus (avec annexes). Signé
à Karachi, le 19 septembre 1960

Protocole relatif au Traité susmentionné. Signé le
novembre, 2 et 23 décembre 1960

Texte officiel: anglais.

Enregistrés par l'Inde le 16 janvier 1962.

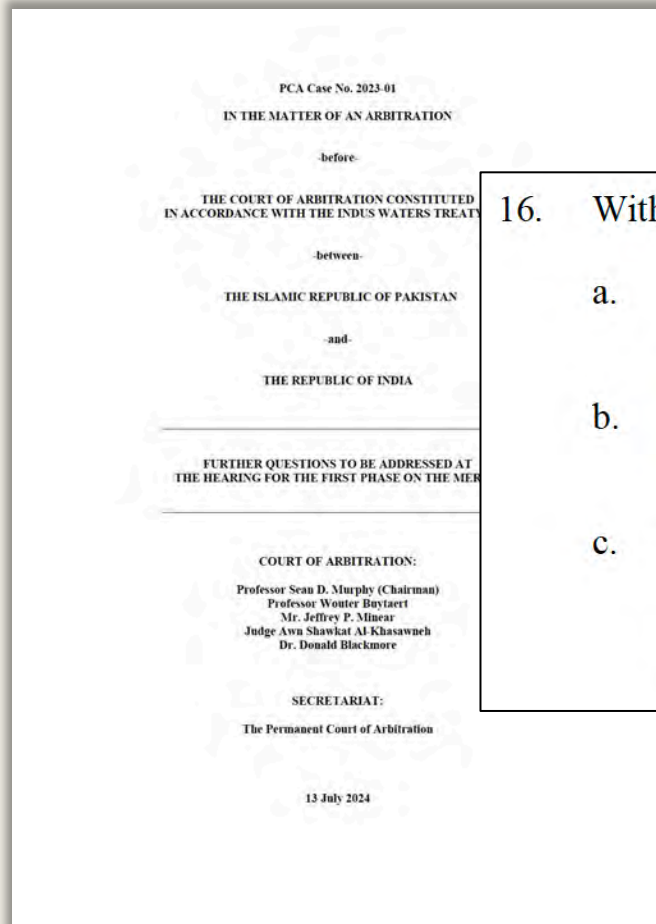
(d) There shall be no outlets below the Dead Storage Level, unless necessary for sediment control or any other technical purpose ; any such outlet shall be of the minimum size, and located at the highest level, consistent with sound and economical design and with satisfactory operation of the works.

(e) If the conditions at the site of a Plant make a gated spillway necessary, the bottom level of the gates in normal closed position shall be located at the highest level consistent with sound and economical design and satisfactory construction and operation of the works.

(f) The intakes for the turbines shall be located at the highest level consistent with satisfactory and economical construction and operation of the Plant as a Run-of-River Plant and with customary and accepted practice of design for the designated range of the Plant's operation.



Question 16(b)

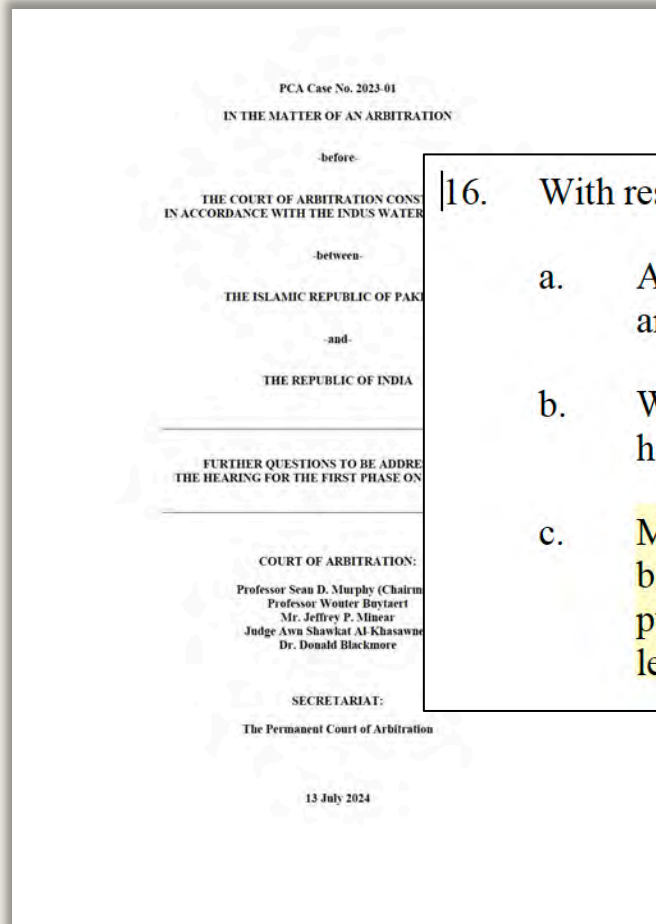


16. With respect to outlets below Dead Storage Level:

- a. Are low level outlets useful for sediment control without reservoir drawdown? If so, when and how?
- b. What would Pakistan understand as constituting a potential “other technical purpose” for having an outlet below Dead Storage Level?
- c. Much of the discussion has focused on “low level outlets” (i.e., located near the reservoir bottom), but Paragraph 8(d) refers to “outlets below Dead Storage Level”. Are there purposes that would call for an outlet below Dead Storage Level that is *not* located at a low level near the reservoir bottom? If so, when and how?



Question 16(c)



16. With respect to outlets below Dead Storage Level:
- Are low level outlets useful for sediment control without reservoir drawdown? If so, when and how?
 - What would Pakistan understand as constituting a potential “other technical purpose” for having an outlet below Dead Storage Level?
 - Much of the discussion has focused on “low level outlets” (i.e., located near the reservoir bottom), but Paragraph 8(d) refers to “outlets below Dead Storage Level”. Are there purposes that would call for an outlet below Dead Storage Level that is *not* located at a low level near the reservoir bottom? If so, when and how?

