

Point of No Return Calculations

For Bala Falls North Dam, Accounting for Proposed Generating Station Flow, Remote Operation, and Rescue Restricted

	Values
PoNR	Point of no return
Q2	Two Year flow return level (Q=flow) = 98 m ³ /s
hw	Water surface elevation above the weir or spillway = 1.67 m
dez	Exclusion Zone
DV1	Warning Zone - 3 times the exclusion zone
DV2	Warning Zone - 2 times the exclusion zone
ddraw	3 x hw at Q2 = 5.01 m
fs	# of YES + # of unknown (method2) = 12 count
Ww	Weir width = 46 m

Method 1 - Point of No Return (dez1)

Used where waterflow spans the entire width of the river, and is not notched

$$\text{PoNR} = \frac{Q2}{hw@Q2} \quad \text{PoNR} = 58.68263 \text{ m}$$

$$\text{dez1} = 1/2 \text{PoNR} \quad \text{dez1} = 29.34132 \text{ m}$$

Method 2 - Drawdown distance (dez2)

Answer

- | | |
|--|---|
| 1 Is the structure obscured or difficult to see from upstream (low head dam, bend in river vegetation??) | 1 |
| 2 Does the river constrict by more than 1/2 the river width within 5 times the river width upstream? | 1 |
| 3 Do powered recreational vessels use the waterway? | 1 |
| 4 Do unpowered vessels use the waterway? | 1 |
| 5 Do commercial vessels use the waterway? | 1 |
| 6 Are there entry points to the waterway (boat launch, portage route, parking lots) within 1 river width of the structure? | 1 |
| 7 Is the flow such that a small vessel or person is likely to be drawn into the hazardous zone? | 1 |
| 8 Is the prevailing wind in the direction of water flow? | 0 |
| 9 Will impingement on the dam or passing over the dam likely result in capsizing, injury or death? | 1 |
| 10 Have any accident, near accidents, or incidents occurred at the site? | 0 |
| 11 Do vessels use the area at night? | 1 |
| 12 Are there any hazards, obstructions or instream structures in the vicinity? | 1 |
| 13 Is any part of the dam operation done remotely? | 1 |
| 14 Is access to emergency rescue restricted (remote location, bank vegetation, steep slopes?) | 1 |

$$\text{dez2} = \text{ddraw} \times \text{fs} \quad \text{dez2} = 60.12 \text{ m}$$

Method 3 - Spillway Width (dez3)

$$\text{dez3} = Ww \quad \text{dez3} = 46 \text{ m}$$

GREATEST DISTANCE = 60 m

BOOM CURRENTLY ABOUT 50m FROM DAM