MVM PAKS II. ZRT.

ERECTION OF NEW POWER PLANT UNITS AT THE PAKS SITE

ENVIRONMENTAL IMPACT STUDY

CLARIFICATION OF FACTS

based on the order with the reference number of 35700/4299-6/2015

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1. Concerning flood control

1.1 Please clarify the following sentence on Page 80 of the Part entitled Modelling of the Danube river morphology and Danube heat load: "In the power plant area (Danube right bank) flood control functions are provided by KDT-VIZIG at the time being on assignment from MVM Paks Power Plant Zrt."

Corrected sentence:

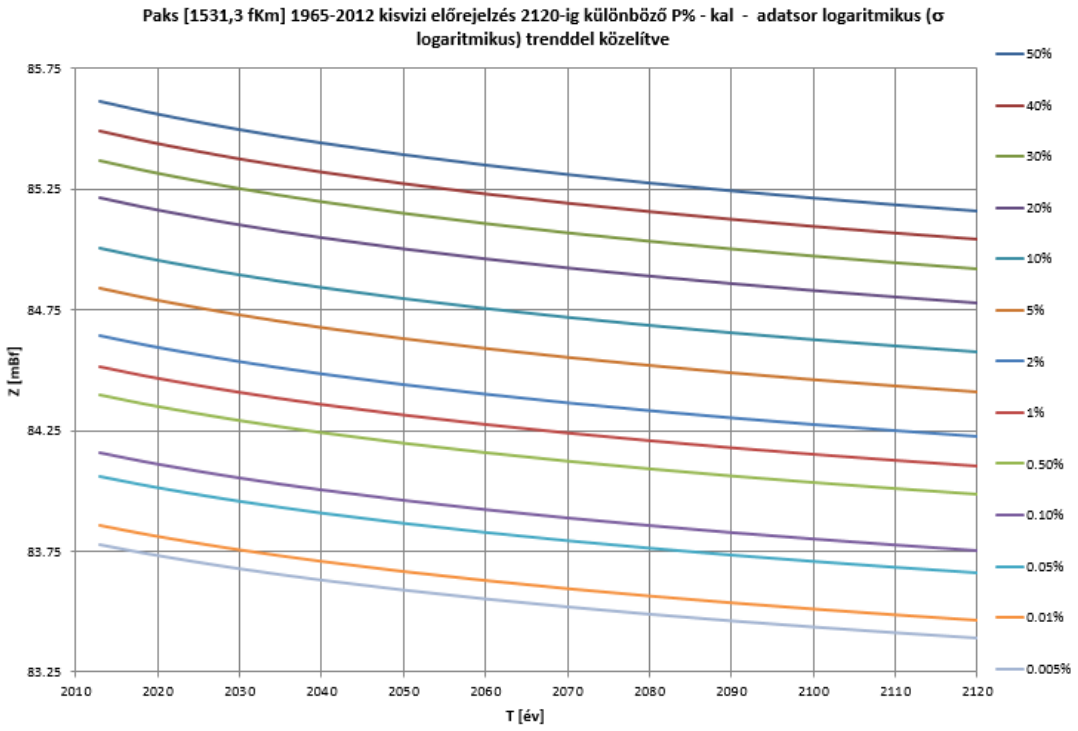
In the power plant area of MVM PA Zrt. flood control functions and works are provided by MVM PA Zrt. KDT VÍZIG contributes to the provision of these function under a Contractor's Agreement.

1.2 You analyse the river bed morphology changes of the Danube on Page 101 on the section between 1512.0 and 1537.3 river kilometres in the period between 2006 and 2013. (With the use of a longer time series the change in the rate of river bed sinking can be better demonstrated and more accurate conclusions can be drawn.) The EIS does not contain any forecast on the expected sinking of Danube at the Cold water channel mouth in the to the period between 2015 and 2090 and the impact of such sinking on water extraction is not evaluated.

Chapter 11 of the EIS contains the estimate of the expected future sinking of the Danube river bed by 2090 for the Danube cold water channel (CWC) profiles:

"Forecast of expected low water levels (Chapter 11.7.1.3.3)

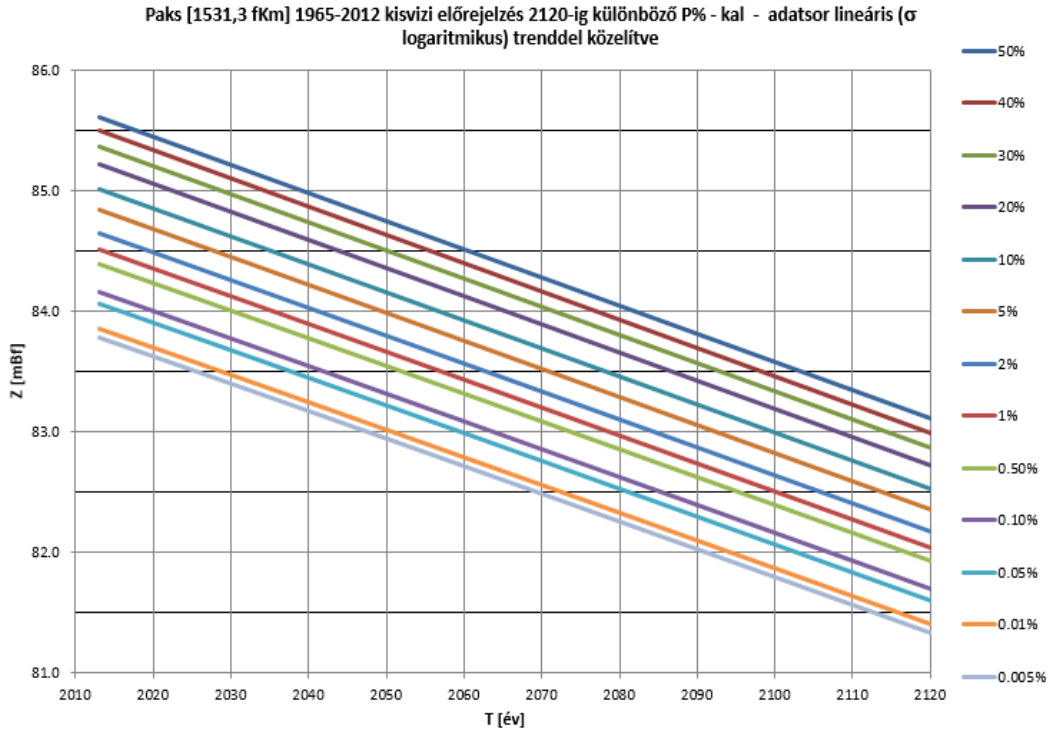
Fitting the low water data set (1965-2012) with logarithmic and linear trends and projected into the future the low water levels recurrent in every 20 000 years were predicted up to 2120.



Paks [1531,3 fKm] 1965-2012 kisvizi előrejelzés 2120-ig különböző P%-kal - adatsor logaritmikus (σ logaritmikus) trenddel közelítve – Low water stage forecast for the Paks (1531.3 river kilometre) profile from the 1965-2012 period up to 2120 with a number of different P% - the data series approximated with the use of a logarithmic (σ logarithmic) trend T (év) – T(year)

Figure 1-1: Forecast of low water stages up to 2120 at the Paks watermark post of the Danube – including logarithmic equalisation

In the event of a logarithmic trend (an optimistic estimate assuming complete shutdown of industrial dredging and a decaying tendency of their impacts) the 20 000 years frequency recurrence rate of low water stage was defined as 83.39 [metres above Baltic sea level] in the 1531.3 river km Danube profile. In the power plant profile this figure is 83.12 metres above Baltic sea level with a total sinking of -0.39 m, average reduction level up to 2120: -0.36 cm/year.



Paks [1531,3 fKm] 1965-2012 kisvizi előrejelzés 2120-ig különböző P%-kal - adatsor lineáris (σ logaritmikus) trenddel közelítve –
Low water stage forecast for the Paks (1531.3 river kilometre) profile from the 1965-2012 period up to 2120 with a number of different P% - the data series approximated with the use of a linear (σ logarithmic) trend

Figure 1-2: Forecast of low water stages up to 2120 at the Paks watermark post of the Danube – including linear equalisation

In the event of a logarithmic trend (provided the current reduction in low water levels and river bed sinking continuous without mitigation) the 20 000 years frequency recurrence rate of low water level was defined as 81.33 [metres above Baltic sea level] in the 1531.3 river km Danube profile. In the power plant profile this figure is 81.06 metres above Baltic sea level with a total sinking of -2.45 m, average reduction level up to 2120: -2.27 cm/year.

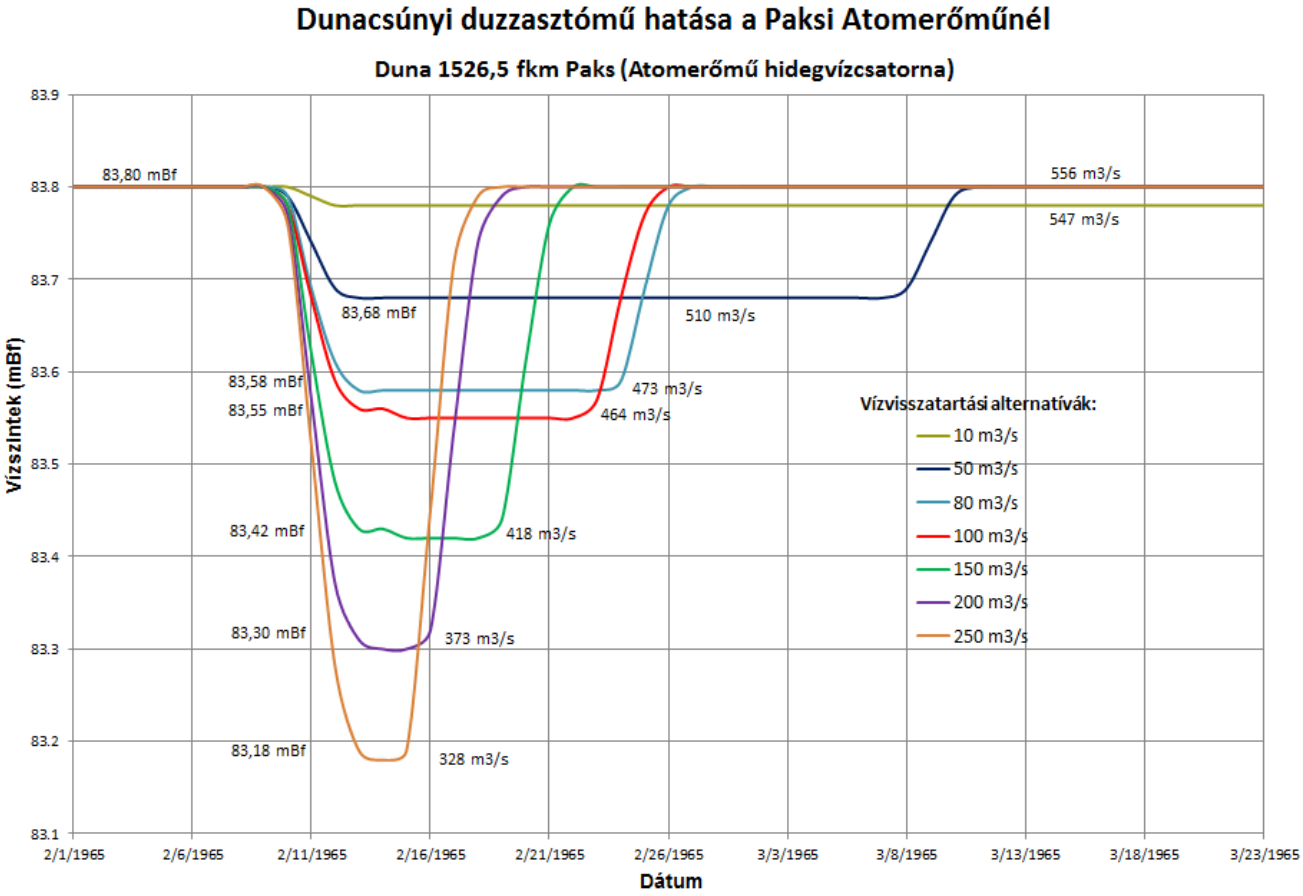
The average value of water level sinking obtained with the two methods (linear and logarithmic equalisation, respectively) is -1.42 m, the average level of reduction up to 2120: -1.31 cm/year. In this case the 20 000 years frequency recurrence rate of low water stage in 2120 at the Paks watermark post is 82.36 metres above Baltic sea level, while in the power plant profile of the Danube (1527 river km) it is 82,09 metres above Baltic sea level.

Upon exit of the units in the proposed Paks II plant in the year of 2090 the following sinking values of low and middle water levels can be expected in the environment of the plant site:

- *With the extrapolation of the linear trend (2090) the sinking level is approximately ~1.8 [m] (-2.29 [cm/year]),*
- *With the extrapolation of the logarithmic trend (2090) the sinking level is approximately ~0.3 [m] (in average: -0.36 [cm/year]),*
- *Calculating with the average of the linear and logarithmic trends (2090) the sinking level is approximately ~1.0 [m] (in average: -1.33 [cm/year]).”*

The impact on water extraction is evaluated by the EIS implicitly, that is the following can be stated with reference to the EIS:

On the basis of the figure in the EIS (11.9.2-5.) it can be stated that the 20 000 years recurrent low water level shall be at the elevation of ~83.80 metres above Baltic sea level in the case of the current river bed.



Dunacsúnyi duzzasztómű hatása a Paksi Atomerőműnél – The impact of the Cunovo barrage at the Paks Nuclear Power plant
Duna 1526,5 fkm Paks (Atomerőmű hidegvízcsatorna) – Danube 1526 river kilometres Paks (Nuclear Power Plant, cold water channel)
Vízszintek (mBf) – Water levels at metres above Baltic sea level
Vízvisszatartási alternatívák – Water retention alternatives
Dátum – Dates

Figure 1-3: The impact of water retention actions charactersied by alternatives of the Cunovo / Gabcikovo barrage system in the low water level periods recurrent in every 20 000 on the security of the water extraction possibilities for the Paks Nuclear Power Plant (Danube, 1526.5 river km)

When the more conservative (pessimistic) river bed morphology trend is applied, the low water river bed of the Danube will sink by 2090 with 1.8 metres below the level of the current river bed, in other words the expected extreme low water level will be at 83.80 metres below Baltic sea level – 1.8 m = 82.0 metres below Baltic sea level. The current bed bottom level of the cold water channel is currently at 81.0 mB (it is proposed to be deepened), while the water extraction threshold water level of the plant pumps (MJO pumps) is at 83.6 metres below Baltic sea level in the embayment.

At low water the surface drop of the cold water channel may be as much as 20 cm, thus a water extraction threshold of 82.0 – 0.2 m can be expected, that is 81.8 metres below Baltic sea level operating water extraction threshold would be needed, and therefore the threshold level of the operating plant pumps ought to be deepened by 1.8 metre (83.6 – 81.8 metres below Baltic sea level).

The linear trend calculates with a more pessimistic and hence, greater river bed sinking, while the logarithmic trend calculates with the asymptotic slowing down of the sinking in the future, due to reaching of the large particle and not easily eroded gravel bed (more optimistic characterisation). Averaging of the two methods approaches to a scenario

which is linear in the first half of the forecasting period and will turn to logarithmic – due to reaching of the gravel layer – in the second half.

Furthermore the EIS deals with the local river bed bottom morphology changes expected on the Danube in the design stage (between 2030 and 2032 in the event of a cooling water extraction rate of 232 m³/s) in the Chapter "Characterisation of the expected flow and morphodynamic impacts on the Danube" (11.9.1.3.). This change, however, has no essential impact on the cooling water extraction levels, because it is limited to a narrow band along the right bank, and because after the year 2037 a lot less local impact can be expected than it was seen in the design stage.

1.3 Furthermore please be informed that the determination of the moderate flood level (MFL) is currently taking place pursuant to Ministerial Decree No 74/2014. (XII.23.) BM on the moderate flood level of rivers.

The EIS was submitted to the licensing authority on 19 December 2014 when the Ministerial Decree referred above was not in force. The maker of the EIS took the effective Ministerial Decree No 11/2010. (IV. 28.) KvVM on the design flood level of rivers into account, which contained the DFL figures in place from 8 August 2014 for the domestic Danube section in the aforementioned Ministerial Decree.

2. Concerning water management

2.1 THE IMPACT STUDY DOES NOT INVESTIGATE THE IMPACT OF THE WASTE WATER DISCHARGED INTO THE DANUBE IN THE EVENT OF AN OPERATING TROUBLE WHICH DUE TO THE INAPPROPRIATE OPERATION OF THE INDUSTRIAL WASTE WATER TREATMENT PLANT UNTREATED WASTE WATER IS DISCHARGED INTO THE RECEIVER ON THE WELLS OF THE EXISTING WATER RESOURCE BASE IN COUNTY TOLNA AND THE WELLS OF THE NEW WATER RESOURCE BASE OF SZEKSZÁRD BUILT IN THE DANUBE FLOOD PLAIN, SITUATED 20 KILOMETRES DOWNSTREAM (THAT IS, WITHIN 50 KILOMETRES) FROM THE MOUTH OF THE HOT WATER CHANNEL IN THE IMPACT MATRIX FOUND IN CHAPTER 22.1,2.2.1 OPERATING TROUBLES, EMERGENCY SITUATIONS. WHAT HAPPENS TO THE WATER RESOURCE BASES OF COUNTY TOLNA LISTED BELOW IN THE CASE OF AN OPERATING TROUBLE IS ENCOUNTERED IN A PERIOD OF LOW WATER LEVEL AND LARGE QUANTITY OF INDUSTRIAL WASTE WATER IS DISCHARGED INTO THE RIVER DANUBE?

The flow of industrial waste waters undergoes a substantial dilution process in the hot water channel even in emergency situations and also at low Danube water level (discharges in fact are transported into the most intensive mixing zone of the Danube, namely into the main current line), which can not cause any measurable load on the *right bank of the Danube: on Gerjen-Dombori, Fadd-Dombori-Bogyiszló (north, south)",* or on the prospective Gerjen North water resource base.

Taking into account the sampling sites upstream (Dunaföldvár) and downstream (Fajsz) of the Paks Nuclear Power Plant, the water quality parameters showed a favourable trend as a function of time for most sampling sites and most water quality parameters, thus it can be stated that the operating four units of Paks Nuclear Power Plant have not played any significant role in the alterations of the water quality of the Danube in the terms of the components evaluated, and the same can be stated for the erection and operation of the new units.

Additionally, the impact of the eventually discharged industrial waste water is further mitigated by the fact that membrane based technology is used for the water treatment plant of the new units instead of the lime sludge/ion exchange technology used earlier for the existing units. This technology needs much less chemicals and hence, the waste water discharge is much less in the event of an emergency situation.

2.2 CHAPTER 14.2.9 (WATER MANAGEMENT IN THE AREA) NEEDS CLARIFICATION: "PROSPECTIVE WATER RESOURCE BASES SITUATED ADJACENT TO THE DANUBE: DANUBE RIGHT BANK: GERJEN-DOMBORI, FADD-DOMBORI-BOGYISZLÓ (NORTH, SOUTH) ", AND GERJEN NORTH PROSPECTIVE WATER RESOURCE BASE DIRECTLY TO THE SOUTH FROM THE HOT WATER CHANNEL. THE FOLLOWING STATEMENT, HOWEVER, IS ERRONEOUS: "AT THE TIME BEING ONLY A PRELIMINARY ESTABLISHMENT LICENCE IS GRANTED, THAT IS THE GERJEN NORTH PROSPECTIVE WATER RESOURCE BASE WAS A BOOKED WATER RESOURCE BASE, WHERE THE WATER WORKS SUPPLYING WATER TO THE CITY OF SZEKSZÁRD IS ENVISAGED." IN FACT, THE EXECUTION WORKS OF THE WATER WELLS DISCHARGING THE CURRENT WATER BASE OF THE CITY OF SZEKSZÁRD HAVE ALREADY BEEN COMMENCED – IN OTHER WORDS THEY HOLD A WATER RIGHTS ESTABLISHMENT PERMIT – AT THE NORTHERN SERIES OF WELLS IN THE FADD-DOMBORI-BOGYISZLÓ PROSPECTIVE WATER RESOURCE BASE (IT WAS NEVER PROPOSED TO THE GERJEN-NORTH PROSPECTIVE WATER RESOURCE BASE AREA).

The EIS was prepared using data available up to March 2014.