

## **ANNEX 3.4:**

### **EXPERT OPINION IN PREPARATION OF THE WATER MANAGEMENT CONDITIONS, PUBLIC COMPANY VODE VOJVODINE, OCTOBER 4, 2005**



Public Water Management Company "Vode Vojvodine", Novi Sad  
21000 Novi Sad, Bulevar Mihajla Pupina 25  
Tel: 021/557 440, central line 557 390, Fax: 021/557 353  
Tax identification number -PIB: 102094162  
e-mail: office@vodevojvodine.co.yu, office@vodevojvodine.com

No.: 02-1002/6  
Date: 04 October 2005

Public Water Management Company "Vode Vojvodine", Novi Sad, upon review of the request by the Public Company "Directorate for Construction" from Vrbas, 80 Marsala Tita St., and pursuant to Articles 14 and 15 of the Law on Waters (Official Gazette of the Republic of Serbia, No. 46/91) issues

### **OPINION**

#### **In the procedure of issuing water conditions**

In our opinion, the Public Company "Directorate for Construction" from Vrbas, 80 Marsala Tita St., pertaining to the construction of the 1st and 2nd phase of the Central Waste Water Treatment Plant (CWWTP) for the towns of Vrbas and Kula, has fulfilled the conditions for issuance of the following water conditions:

1. CWWTP Project has to be elaborated in accordance with the adopted concept of waste water collection, canalling and treatment in the towns of Vrbas and Kula, which entails the provision of urbanistic conditions-approval from both Municipalities.
2. The Project has to establish the quantities and type of waste water that will be treated at the CWWTP. Dimensioning of the facilities has to be carried out in accordance with hydraulic, biochemical and other calculations and analysis for all waste waters produced, expressed in the number of equivalent inhabitants.
3. The Project has to elaborate in detail technical-technological solutions for the wastewater treatment process and direct effluent discharge into the canal Bogojevo-Becej.
4. Conditionally clean atmospheric and cooling used water from the CWWTP complex, classified as 2nd category water, may be discharged without prior treatment into atmospheric sewerage or melioration canals, through adequate discharge points.
5. All technological wastewater connected to the CWWTP have to satisfy prescribed conditions for discharge into public sewerage network of Vrbas and Kula, i.e. they have to be primarily treated at proper wastewater treatment plants. The Project should encompass all the above users.
6. Prior to the effluent discharge into the canal of the Hydro system Danube-Tisza-Danube, Becej-Bogoevo, in the 1st construction phase of the CWWTP, the concentration of certain parameters, upon treatment, has to remain in the following threshold limits:
  - BOD5 average daily.....up to 25 mg/l
  - Suspended substances.....up to 30 mg/l
  - COD.....up to 125 mg/l
  - Fats and oils (ether extract).....up to 0.1 mg/l

21 November 2007



Municipal Infrastructure Agency Support Programme  
An EU-funded project managed by the European Agency for Reconstruction  
9R5927/CvS/R2006\_20/R001

Fesibility Study Vrbas  
Final Report

- Harmful and hazardous substances, in accordance with the Regulation on hazardous substances in waters (Official Gazette SRS, No. 31/82) for the prescribed recipient category

In the 2nd construction phase, the Project should encompass removal of nitrogen and phosphorus, in such a way that their concentration in the effluent remains within the following threshold limits:

- total nitrogen..... up to 10 mg/l
  - total phosphorus..... up to 1 mg/l
7. The Project should encompass the calculation of treatment effects of each technological unit of the waste water treatment plant.
  8. The Project should encompass the solution for the cleaning of the waste water treatment plant, for sludge treatment and for the final disposition of extracted substances and sludge, in such a way to avoid soil and water pollution.
  9. All facilities at the water line and sludge line have to be water-impermeable.
  10. Installation of flow meter for the effluent should be foreseen, in order to register the quantities of treated waters discharged into the canal Bogojevo-Becej.
  11. The Project should envisage a monitoring system for the waste water treatment plant, as well as for the final control of the effluent quality prior to the discharge into the recipient.
  12. The Project conditions for the effluent discharge into the canal Becej-Bogojevo, at around 40 km+500, are as follows:
    - 12.1. Typical water level regime in the canal, at the discharge point, is as follows:
      - maximum level.....78.70 m asl
      - minimum level.....77.50 m asl
      - working level (maximum duration)....78.20 m asl up to 78.50 m asl
    - 12.2. In the working-inspection path area, along the canal bank, min. 7.0m width, no facilities should be built, while the effluent discharge pipeline should be placed min. 1.5m below the ground, and protected from the pressure produced by heavy construction machinery that maintains the canal. The passage by the canal bank has to be constantly maintained.
    - 12.3. The effluent facility should not enter into the canal flow profile; it has to be a stable facility, protected from all types of erosion. Appropriate canal covering has to be foreseen at the discharge point, as a protective measure against canal profile erosion.
    - 12.4. The project has to establish an accurate discharge stationary into the canal.
  13. The CWWTP complex is located at the land bordered by melioration canals, IV-D-10, IV-D-10-2, IV-D-10-2-1, while the effluent pipeline is intersected with canal IV-D-10 at 1km+800. The project has to respect the following recommendations:
    - 13.1. In the working-inspection path area, along the canal bank, min. 14.0m width, no facilities should be built, no fence should be placed, no protective green belt should be planted, etc.
    - 13.2. At the intersection of the effluent pipeline with the canal IV-D-10, the pipeline should be placed min. 1.5m below the elevation of the canal bottom, and it should be maintained at such depth in the length of the canal width, at the ground level. Above the pipeline, protective concrete tables should be placed.
    - 13.3. Permanent marks for marking the intersection points should be foreseen.
  14. The Consulting Company is obliged to request all detailed design information (canal profiles etc.) from the present company, at the sector of the Hydro system DTD (Becej-Bogojevo canal), while for the melioration canal the relevant information should be requested from the Public Water Company "Backa" Vrbas.

21 November 2007



Municipal Infrastructure Agency Support Programme  
An EU-funded project managed by the European Agency for Reconstruction  
9R5927/CvS/R2006\_20/R001

Fesibility Study Vrbas  
Final Report

15. Project implementation is feasible in two phases (1st phase from 2010 to 2015, and 2nd phase by 2022).

## ARGUMENTATION

Public Company "Directorate for Construction" from Vrbas, 80 Maršala Tita St., has presented a request for opinion in the procedure of water conditions issuance.

Request No. 2424, dated 05 August 2005, was filed at the Archive of PWMC "Vode Vojvodine" Novi Sad, No. 02-1002/1, on 08 August 2005.

Along with the request, a Technical description of the CWWTP in Vrbas was enclosed, as well as a detailed situation, the CWWTP site location and the connected pipelines.

Upon reviewing the present request and documentation enclosed, we have established that the planned site of the Central Waste Water Treatment Plant is located at the site of the existing Waste Water Treatment Plant, which is out of function. The site is bordered by melioration canals, marked IV-D-10, IV-D-10-2, IV-D-10-2-1. As a recipient of the treated waste waters, the canal of the Hydro system DTD, Bečej-Bogojevo, in the vicinity of the triangle and bridge for Bačko Dobro Polje (at around 40km+500) has been envisaged.

The Investor has planned the construction of the Waste Water Treatment Plant for the towns of Vrbas and Kula. In the town of Vrbas, the existing public sewerage network is mainly separate type, for the collection of atmospheric water, in particular sanitary waters and technical water, while in the town of Kula the atmospheric sewerage is separated from the sanitary sewerage. As far as the industrial waste waters are concerned, their primary treatment has to be foreseen at the facilities, prior to the discharge into the public sewerage.

The CWWTP construction is planned in two phases, i.e. the first phase in the period from 2010 to 2015, and the second phase by the end of 2022. In the 1st construction phase, facilities for primary and secondary treatment are foreseen, with nitrification and extracted sludge treatment, up to the level usable in agricultural production, or disposable safely at landfills. In the 2nd phase, plants and facilities for phosphorus and nitrogen removal from waste waters will be constructed.

Based on the above mentioned, a proposal has been made, as in the disposition of the present Opinion.

It has to be mentioned that the water conditions are issued by the Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia - Directorate for Water, Belgrade. The Request for water conditions issuance should be accompanied by the present Opinion.

Annex: Situation x 1

Deliver to:

1. Public Company "Directorate for Construction", Vrbas, 80 Marsala Tita St.
2. Public Water Company "Backa" Vrbas (No. 3042/05. dated 30 August 2005)
3. Sector Hydro system DTD (No. 37/126, dated 17 August 2005)
4. 02
5. 03
6. Archive

DIRECTOR

Branislav Radanovic, BSc CE

21 November 2007



Municipal Infrastructure Agency Support Programme  
An EU-funded project managed by the European Agency for Reconstruction  
9R5927/CvS/R2006\_20/R001

Fesibility Study Vrbas  
Final Report