

CONSTRUCTED WETLAND SYSTEM FOR TREATMENT OF URBAN WASTEWATER OF THE CITY OF ORHEI - MOLDOVA



ORIGINAL NEED

The constructed wetland of Orhei, which construction began in the first months of 2012, may be, when it is finished, the largest constructed wetland system for secondary treatment present worldwide. Orhei is a city located in the centre of Moldova and counts around 32.000 inhabitants: wastewaters are currently treated by an old percolating filter now unable to perform adequate treatment.



In order to reduce energy costs and guarantee a better treatment performance at the same time, the local authorities have decided to establish a constructed wetland system which permit low investment and management costs with a good technical reliability in terms of service. This choice has been backed up financially by the World Bank, who recognized wetland systems as the most adequate for the treatment of small and middle-sized settlements in developing countries.

LOCATION

City of Orhei
Moldova

COMMITTANT

World Bank,
Global Environment Facility
Project – P.I.U. Moldova Gov.

NUMBER OF PERSON EQUIVALENT

30.000

WASTEWATER TYPOLOGY

Urban

PLANT TYPOLOGY

4 lines RBF+VF in parallel

AREA (M2)

50.000

COST

3.387.000,00 Euro

YEAR OF REALIZATION

2012-2013

DESCRIPTION

The plant has been designed to face different issues such as seasonal variations of wastewater, population growth, which is believed to be more pronounced than in Italy (to be checked, because of political instability problems and the migration flows in this area), the lack of adequate management ability for complex technological plant, problems of sludge disposal, the lack of treatment plants able to handle extra flows, the extreme climatic conditions during winter in Moldova, with snow cover during the whole winter and minimum temperature peaks of -30°C .

Wastewaters to be treated are usually from municipal origin, but they are also largely composed of industrial effluent, from food processing activities related to collecting and processing of fruit.



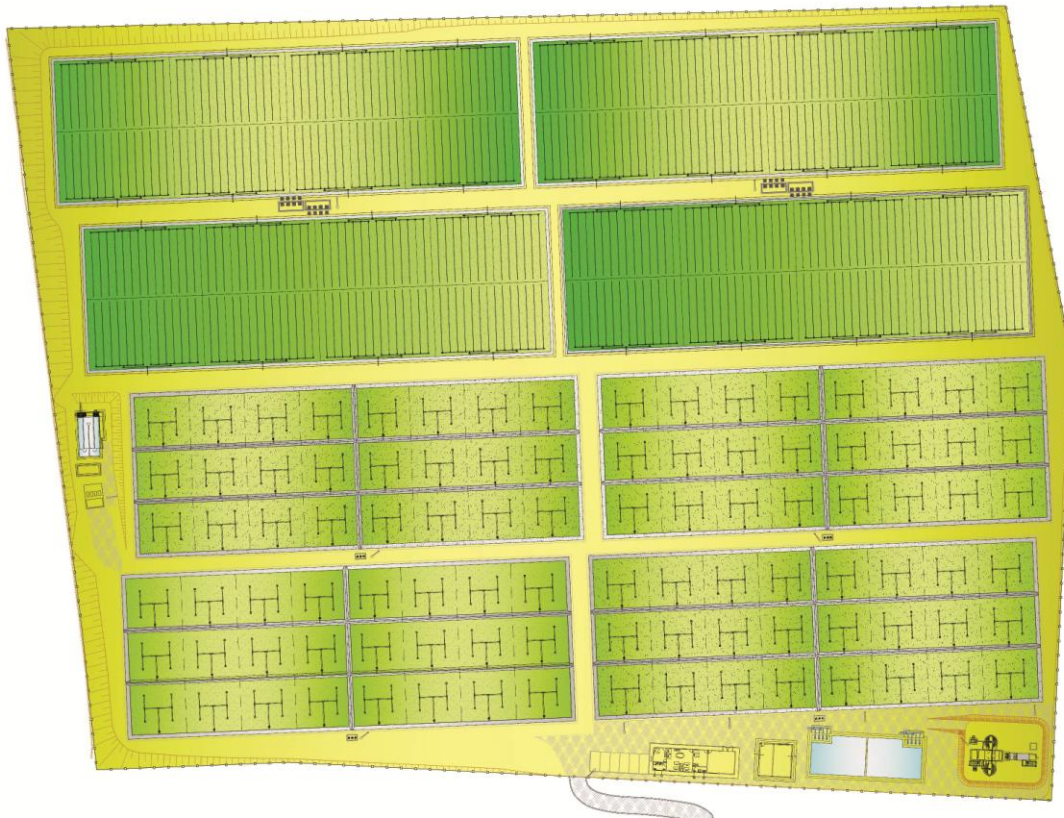
The new wastewater treatment plant, designed by the group composed by the Italian company Iridra Srl, SWS Consulting, Hydea, together with the Austrian company Posch&Partners Consulting Engineering, settled for the following treatment scheme:

- a mechanical screw screen and grit removal chamber, a flow equalization and pre aeration tank;
- a wetland system, divided in four lines, each of them composed of two stages in series: the first stage is a French system with a vertical flow reed bed for raw sewage and a classical vertical flow reed bed system for the second stage; the total surface is 35.000 m^2 .
- final disinfection pumping system for discharge into Raut river.

	2012	2017	2022
Inhabitants equivalents	20.000	26.600	33.300
Rate of flow (m ³ /g)	2100	3500	4600
Rate of organic load (kgBOD ₅ /g)	700	1050	1300
Seasonal flow peak (m ³ /g)	2700	4400	6000
Seasonal organic load peak (kgBOD ₅ /g)	1200	1600	2000

The choice of a so-called “French system” has been settled because of sludge disposal problems in the primary treatment system: the sludge collected on surface water will be removed each 8-10 year and reused as fertilizer in agriculture.

The treatment plant area is 5 ha, 10 additional ha have been planned for later expansion.



Scheme of the plant