

DOI: <http://doi.org/10.21698/simi.2018.ab07>

## GROUNDWATER QUALITY FROM VASLUI COUNTY

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**Keywords:** *chemical parameters, groundwater, water quality*

### **Introduction**

Groundwater is one of the main sources of drinking water in Europe and Romania. Knowing the raw water quality is needed for choosing the correct operations that make up the potabilisation process. The study objective was to determine Vaslui county raw water quality used in the potabilisation process. The raw groundwater main quality parameters stipulated in the national Drinking Water Quality Act no. 458/2002, republished in 2011, were determined. In this paper, the parameters that exceed the imposed limit and therefore represent quality nonconformities identified in certain locations are presented.

### **Materials and methods**

Parameters determination was done according to standard methods: iron and manganese - SR EN ISO 11885:2009, ammonium - SR ISO 7150-1:2001, nitrate - SR ISO 7890-3:2000, boron - SR EN ISO 11885:2009, sodium - SR EN ISO 11885:2009, chloride - SR ISO 9297:2001, water hardness - SR ISO 6059:2008.

### **Results and conclusions**

65 sources of groundwater from Vaslui county were characterised within the study. Table 1 shows the parameters with values that exceed the imposed limit (MAC) and geographic localisation of the locations in which they occurred are presented in Figure 1. These quality nonconformities are:

- exceeding of MAC = 200 µg/L for Fe<sub>t</sub>, seven sources: 223 – 1988 µg/L;
- exceeding of MAC = 50 µg/L for Mn<sub>t</sub>, eleven sources: 52.7 -1081 µg/L;
- exceeding of MAC = 0.5 mg/L for ammonium, fourteen sources: 0.8 – 6.8 mg/L;
- exceeding of MAC = 50 mg/L for nitrate, five sources: 70 – 381 mg/L;
- exceeding of MAC = 1 mg/L for bor, two sources: 1.88-2 mg/L;
- exceeding of MAC = 200 mg/L for sodium, six sources: 234 - 443 mg/L;
- exceeding of MAC = 250 mg/L for chloride, one source: 462 mg/L;
- water hardness below of minimum admissible concentration (5 German degrees), thirteen sources: 0.5 – 4.2 German degrees.

**Table 1.** Vaslui County groundwater quality nonconformities (I)

| <b>Groundwater</b>         | <b>Fe<sub>t</sub><br/>μg/L</b> | <b>Mn<sub>t</sub><br/>μg/L</b> | <b>NH<sub>4</sub><sup>+</sup><br/>mg/L</b> | <b>Na<sup>+</sup><br/>mg/L</b> |
|----------------------------|--------------------------------|--------------------------------|--|--------------------------------|
| Costesti                   |                                |                                | 0.97                                       |                                |
| Laza                       |                                |                                | 0.92                                       |                                |
| Rafaila                    | 634                            | 255                            | 1.1  |                                |
| Stanilesti                 | 236                            | 60.6                           | 1.1  | 299                            |
| Poienesti                  |                                |                                | 1.48                                       |                                |
| Vetrisoiaia                |                                |                                | 2.79                                       | 234                            |
| Valeni                     |                                |                                | 6.8  | 443                            |
| Miclesti                   | 598                            | 1081                           |  |                                |
| Chircesti/Miclesti         |                                |                                | 1.2  |                                |
| Popesti/Miclesti           |                                | 78                             | 4.15                                       |                                |
| Movila lui Burcel/Miclesti |                                |                                | 4.66                                       | 400                            |
| Bacesti                    | 1988                           | 580                            | 2.54                                       |                                |
| Osesti                     |                                |                                | 2.54                                       |                                |
| Buda                       |                                | 329                            | 3.67                                       |                                |
| Bogdanesti                 |                                | 139                            |  |                                |
| Urdesti/Dodesti            | 223                            | 85                             |  |                                |
| Lunca Banului              | 273                            | 80.6                           |  |                                |
| Bogdanesti/Falciu          | 228                            |                                |  | 400                            |
| Popeni/Zorleni             |                                | 183                            | 0.8  |                                |
| Simila/Zorleni             |                                | 52.7                           |  |                                |
| Carja/Murgeni              |                                |                                |  | 240                            |
| <b>MAC</b>                 | <b>200</b>                     | <b>50</b>                      | <b>0.5</b>                                 | <b>200</b>                     |

**Table 2.** Vaslui County groundwater quality nonconformities (II)

| <b>Groundwater</b>            | <b>NO<sub>3</sub><sup>-</sup><br/>mg/L</b> | <b>B<br/>mg/L</b> | <b>Cl<sup>-</sup><br/>mg/L</b> | <b>D<sub>t</sub><br/>°G</b> | <b>Groundwater</b> | <b>D<sub>t</sub><br/>°G</b> |
|-------------------------------|--|-------------------|--------------------------------|-----------------------------|--------------------|-----------------------------|
| Idrici/Rosiesti               | 70   |                   |                                |                             | Poienesti          | 1.54                        |
| Rediu/Rosiesti                | 293.5                                      |                   |                                |                             | Vetrisoiaia        | 0.61                        |
| Manzati/Ibanesti              | 103.1                                      |                   |                                |                             | Zorleni            | 0.96                        |
| Deleni                        | 306-381                                    |                   |                                |                             | Simila/Zorleni     | 0.79                        |
| Bartalusi Razesii             | 78   |                   |                                |                             | Puiesti            | 1.4                         |
| Valeni                        |  |                   | 462                            | 3.45                        | Bacani             | 4.2                         |
| Bogdanesti/Falciu             |  | 1.88              |                                |                             | Raiu/Murgeni       | 0.5                         |
| Carja/Murgeni                 |  | 2                 |                                | 0.89                        | Hoceni             | 1.06                        |
| Murgeni                       |  |                   |                                | 0.78-1.1                    | Laza               | 1.23                        |
| Hurduci/<br>Dimitrie Cantemir |  |                   |                                | 2                           |                    |                             |
| <b>MAC</b>                    | <b>50</b>                                  | <b>1</b>          | <b>250</b>                     | <b>min. 5</b>               | <b>MAC</b>         | <b>min.<br/>5</b>           |

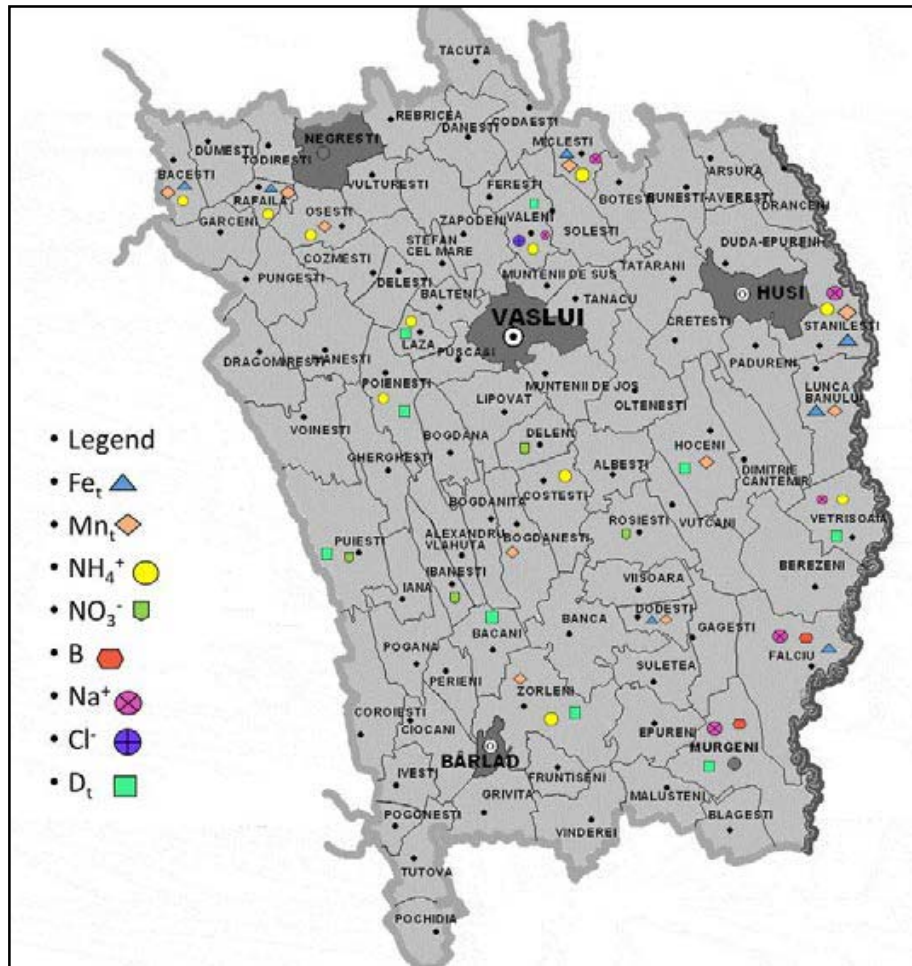


Figure 1. Study area map

The measured deviations must be corrected by treatment processes that are to be proposed and implemented for case study area.