November 2006

TECHNICAL ASSISTANCE FOR IRON GATE SEDIMENTS EVALUATION

Report on Support Activities for the DRP Component on Iron Gates Sediments Evaluation, provided by VITUKI
AUTHORS

PREPARED BY:
VITUKI Environmental Protection and Water Management Research Institute

AUTHORS:
Dr. Béla Csányi
Ms. Mária Bihari
TABLE OF CONTENTS

1. Project objectives..................................................................................................................5
2. Approach of work in line with the required services .......................................................5
   2.1. Provision of a vessel for sampling mission..............................................................5
   2.2. Collection of samples ...............................................................................................5
   2.3. Analysis of samples .................................................................................................6
3. Results and conclusions .................................................................................................6
   3.1. Provision of a vessel for sampling mission..............................................................6
   3.2. Collection of samples ...............................................................................................6
   3.3. Analysis of samples .................................................................................................7
   3.4. Applied analytical methods for the analysis of sediment samples in VITUKI ..........7
   3.5. Results of measurements .........................................................................................9
   3.6. Conclusion ........................................................................................................... 10

Annex: Tables and Figures

ABBREVIATIONS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DRP</td>
<td>Danube Regional Project</td>
</tr>
<tr>
<td>VITUKI Kht.</td>
<td>VITUKI Environmental Protection and Water Management Research Institute</td>
</tr>
</tbody>
</table>
EXECUTIVE SUMMARY

DRP’s Component 4.2 has the objective to assess the sediment quality in the Iron Gate Reservoir and to prepare initial recommendations for future protection of the Danube River and Black Sea. The project is an assessment of data and information on the Iron Gate sediments and is a step in identifying gaps in the available information.

This assignment (Technical assistance for Iron Gate sediments evaluation) aimed at assisting the Romanian and Serbian National Teams by providing a sampling ship and collection and analysis of samples for direct comparison with the National Teams. The sampling survey was carried out in September 2006 by the ship ARGUS. Grab samples and core samples were taken at the preselected 10 sections in the Iron Gate reservoir region in the Danube reach 928-1107 km.

The determinands total phosphorus, organic nitrogen, heavy metals (mercury, cadmium, lead, nickel, chromium, arsenic, copper, zinc), extractable petroleum hydrocarbons, organochlorine pesticides (DDT, lindane, aldrin, endrin, dieldrin), nonylphenol, octylphenol, pentachlorophenol, di(2-ethylhexyl)phthalate, PAHs, PCBs and particle size distribution were analyzed by widely used methods in the laboratory of VITUKI Kht.

The analytical results indicate the spatial concentration distribution of different contaminants in the bottom sediment of the Iron Gate reservoir.

The analytical results of the measurements in the VITUKI laboratory can be used for comparative analysis together with the results of the Romanian and Serbian teams for the same samples.

The analytical results contribute to the assessment of sediment contamination in the Iron Gate reservoir.
1. PROJECT OBJECTIVES

The overall objective of the DRP’s Component 4.2 is to assess the sediment quality in the Iron Gate Reservoir and to prepare initial recommendations for future protection of the Danube River and Black Sea. The specific objectives include:

1. Collecting and reviewing the existing data and information on present situation (especially heavy metals, nutrients, silicates and other dangerous substances);
2. Assessing the main types and quantities of dangerous substances;
3. Assessing the potential environmental impacts on the Danube and the Black Sea;
4. Forecasting development for a period of 20 years;
5. Discussing possible precautionary and rehabilitation measures for the Danube and the Black Sea;
6. Preparing recommendations for dealing with this problem in the forthcoming decade (measures to be included in the Joint Action Programme of the ICPDR);
7. Undertaking sampling and analysis as agreed by the overall project team;
8. Proposing further monitoring programmes.

This project is an assessment of data and information on the Iron Gate sediments and is a step in identifying any gaps in the available information leading to the need for future investment (e.g. international donors) programmes for remediation.

The objectives of this assignment (Provision of Support Activities) is to assist the National Teams (under the direction of the Project Co-ordinator) by:

> Providing a sampling ship;
> Collection and analysis of samples for direct comparison with the National Teams.

2. APPROACH OF WORK IN LINE WITH THE REQUIRED SERVICES

To achieve the objectives of provision of support activities the following tasks were undertaken by the Contractor:

2.1. Provision of a vessel for sampling mission

The International Laboratory was required to obtain the services of an appropriate vessel to enable samples to be collected from the Iron Gate Reservoir.

2.2. Collection of samples

The International Laboratory was required to collect samples (as agreed by the project team) for subsequent analysis.
2.3. Analysis of samples

The International Laboratory was required to analyse the samples for an agreed list of determinands.

3. RESULTS AND CONCLUSIONS

3.1. Provision of a vessel for sampling mission

The ship “Argus” (Serbia) was selected for sampling in the Iron Gate region. The Serbian Ministry of Science and Environmental Protection agreed to rent the ship Argus for the project in the period 10-15 September 2006.

3.2. Collection of samples

A plan was prepared and discussed for sediment sampling sites and sampling schedule.

Table 1 Proposed sediment sampling sites:

<table>
<thead>
<tr>
<th>No.</th>
<th>Name of sampling site</th>
<th>km</th>
<th>Grab sample</th>
<th>Core sample++</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Upstream of Velika Morava</td>
<td>1107</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Downstream of Velika Morava</td>
<td>1097</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Ram/Stara Palanka</td>
<td>1077</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>4</td>
<td>Veliko Gradiste / Belobresca</td>
<td>1061</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Golubac / Coronini</td>
<td>1043</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Dobra / Lubcova</td>
<td>1022</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Donji Milanovac</td>
<td>990</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>8</td>
<td>Dubova</td>
<td>971</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Orsova</td>
<td>955</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>10</td>
<td>Mala Vrbica / Simian</td>
<td>927</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

+ upper 10 cm layer of sediment
++ vertical profile (10 cm deep layers, max. 1 m deep profile)
Table 2 Schedule of sampling:

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Departure: Belgrade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Arrival: Veliko Gradiste</td>
</tr>
<tr>
<td></td>
<td>Sampling at sites No. 1-4</td>
</tr>
<tr>
<td>Day 2</td>
<td>Departure: Veliko Gradiste</td>
</tr>
<tr>
<td></td>
<td>Arrival: Donji Milanovac</td>
</tr>
<tr>
<td></td>
<td>Sampling at sites No. 5-7</td>
</tr>
<tr>
<td>Day 3</td>
<td>Departure: Donji Milanovac</td>
</tr>
<tr>
<td></td>
<td>Arrival: Mala Vrbica</td>
</tr>
<tr>
<td></td>
<td>Sampling at sites No. 8-10</td>
</tr>
<tr>
<td>Day 4</td>
<td>Departure: Mala Vrbica</td>
</tr>
<tr>
<td></td>
<td>Arrival: Belgrade</td>
</tr>
</tbody>
</table>

The actual sampling sites with GPS co-ordinates and sampling dates are listed in Annex Table 1.

### 3.3. Analysis of samples

Analysis of grab samples from sampling sites No 1 L and R, 2 L and R, 3 L and R, 4 L and R, 5 L and R, 6 L and R, 7 L and R, 8 R, 9 L and R, 10 L and R, Core 1077 R, Core 991 R, Core 956 L were carried out in VITUKI laboratory.

The measured determinands in sediment were: total phosphorus, organic nitrogen, heavy metals (mercury, cadmium, lead, nickel, chromium, arsenic, copper, zinc), extractable petroleum hydrocarbons, organochlorine pesticides (DDT, lindane, aldrin, endrin, dieldrin), nonylphenol, octylphenol, pentachlorphenol, di(2-ethylhexyl)phthalate, PAHs, PCBs and particle size distribution.

### 3.4. Applied analytical methods for the analysis of sediment samples in VITUKI

The analytical methods of the determinands applied in VITUKI were as follows:

- **Heavy metals, trace elements** *(mercury, cadmium, lead, nickel, chromium, arsenic, copper, zinc)*
  Sample preparation: microwave digestion of freeze dried sample with nitric acid and hydrogen peroxide.
  Analytical method: AAS flame atomization (in case of mercury cold vapour technique, in case of arsenic hydride technique)
Total phosphorus
Sample preparation: digestion of freeze dried sample with sulphuric acid and later with hydrogen peroxide.
Analytical method: the ortho-phosphate reacts with molybdate. It develops blue colour in the presence of antimon(III) ions, after reduction by ascorbic acid. Measurement at 820 nm.

Organic nitrogen + ammonium-nitrogen
Sample preparation: digestion of freeze dried sample with sulphuric acid and later with hydrogen peroxide.
Analytical method: after the digestion the resultant ammonium reacts with salicilate and hypochlorite ion in the presence of nitroprusside-sodium. Colorimetric measurement at 655 nm.

Extractable petroleum hydrocarbons (GC/FID method)
Sample preparation: extraction of wet sediment with acetone plus hexane solution of squalane. The evaporated residue is dissolved in hexane and cleaned on SPE Si-cartridge. 1-chlor-nonane is added to the sample.
Chromatographic conditions:
Carrier gas: H2 30 ml/min (0.9 kPa)
Split: 1:60
Column: DB-5, 20 m x 0.25 mm, HP-5 5 % phenyl-methyl-silicone polymer

Di(2-ethyl-hexyl)phthalate
Sample preparation: extraction of wet sediment with acetone plus hexane solution of dipentylphthalate. Second extraction with hexane. The hexane solution is cleaned on SPE Si-cartridge. Elution with dichloro-methane.
GC conditions:
Carrier gas: H2 30 ml/min (0.9 kPa)
Split: 1:60
Column: DB-5, 20 m x 0.25 mm, HP-5 5 % phenyl-methyl-silicone polymer

PAHs
Sample preparation: d10-fluoranthene and d12-chrisene (dissolved in methanol) is added to the sample. The sample is freeze dried and extracted with dichloro-methane in ultrasonic bath. The extractum is centrifugated, dried on sodium-sulphate, evaporated by nitrogen, cleaned on SPE Si-cartridge. Elution with dichloro-methane, ISTD is added.
GC conditions:
Column: DB-5, 30 m, 0.25 mm, 0.25 µm
Carrier gas: He
MS:
Ionisation: El+/SIR, 70 eV, 200µA

Organochlorine pesticides (DDT, lindane, aldrin, endrin dieldrin)
Sample preparation: The sample is freeze dried and extracted with dichloro-methane in ultrasonic bath. The extractum is cleaned on SPE Si-cartridge. Eluation with dichloro-methane.

GC conditions:
Column: DB-5ms, 30 m, 0.25 mm, 0.25 µm
Carrier gas: He
MS:
Ionisation: El+/SIR, 70 eV, 200µA
R=4000

PCBs
Sample preparation: The sample is freeze dried and extracted with dichloro-methane in ultrasonic bath. The extractum is cleaned on SPE Si-cartridge. Eluation with dichloro-methane.

GC conditions:
Column: DB-5ms, 30 m, 0.25 mm, 0.25 µm
Carrier gas: He
MS:
Ionisation: El+/SIR, 70 eV, 200µA
R=4000

Nonylphenol, octylphenol, pentachlorphenol
Sample preparation: The sample is freeze dried and extracted with dichloro-methane in ultrasonic bath. The extractum is cleaned on SPE SiOH-cartridge. Eluation with dichloro-methane. Eluate is dried with nitrogen then derivatization: addition of 2,6-diterciel-butylphenol, acetic acid anhydride, triethylamin. 1 hour long reaction at 60 oC. Addition of distilled water, sodium chloride to the cooled sample, extraction with hexane. Analysis with GC-MSD.

Particle size distribution
Granulometric measurement

3.5. Results of measurements

The analytical results (concentrations in dry sediment) are indicated in Annex Table 2.
Figure 1-3. shows selected determinand concentrations in core sample profiles.
Figure 4. shows the particle size distribution results of grab samples.
3.6. Conclusions

- The sediment sampling survey was carried out according to the proposed plan: grab samples and core samples were taken at the preselected sites in the Iron Gate reservoir region.
- The applied analytical methods are widely used procedures.
- The analytical results indicate the spatial concentration distribution of different contaminants in the bottom sediment of the Iron Gate reservoir.
- The analytical results of the measurements in the VITUKI laboratory can be used for comparative analysis together with the results of the Romanian and Serbian teams for the same samples.
- The analytical results contribute to the assessment of sediment contamination in the Iron Gate reservoir.
## TABLE 1 ACTUAL SAMPLING SITES AND SAMPLING DATES

<table>
<thead>
<tr>
<th>Iron Gates sample number</th>
<th>Sample type</th>
<th>Km index</th>
<th>Location</th>
<th>Location in Profile</th>
<th>GPS Coordinates</th>
<th>Sampling Date [MM/DD/YYYY]</th>
<th>S. Time [HH:MM]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>grab</td>
<td>1107</td>
<td>Upstream Velika Morava</td>
<td>L</td>
<td>44 43 33,8 21 00 09.9</td>
<td>2006.09.11 13:30</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>grab</td>
<td>1107</td>
<td>Upstream Velika Morava</td>
<td>R</td>
<td>44 42 58,1 21 00 25,8</td>
<td>2006.09.11 12:50</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>grab</td>
<td>1097</td>
<td>Downstream Velika Morava</td>
<td>L</td>
<td>44 44 16,4 21 07 37,0</td>
<td>2006.09.11 14:45</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>grab</td>
<td>1097</td>
<td>Downstream Velika Morava</td>
<td>R</td>
<td>44 43 44,8 21 07 51,8</td>
<td>2006.09.11 14:57</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>core</td>
<td>1077</td>
<td>Stara Palanka - Ram</td>
<td>R</td>
<td>44 48 33,0 21 19 43,2</td>
<td>2006.09.11 17:00</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0-10 cm</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10-20 cm</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20-30 cm</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30-40 cm</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>40-50 cm</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50-60 cm</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>60-70 cm</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>70-77 cm</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>grab</td>
<td>1072</td>
<td>Bazias</td>
<td>L</td>
<td>44 48 12,9 21 23 31,0</td>
<td>2006.09.11 19:10</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>grab</td>
<td>1072</td>
<td>Bazias</td>
<td>R</td>
<td>44 48 17,3 21 22 48,4</td>
<td>2006.09.11 19:30</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>grab</td>
<td>1061</td>
<td>Veliko Gradiste / Belobresca</td>
<td>L</td>
<td>44 46 33,2 21 29 44,6</td>
<td>2006.09.12 10:00</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>grab</td>
<td>1061</td>
<td>Veliko Gradiste / Belobresca</td>
<td>R</td>
<td>44 46 05,3 21 29 36,3</td>
<td>2006.09.12 10:20</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>grab</td>
<td>1040</td>
<td>Golubac / Koronin</td>
<td>L</td>
<td>44 40 06,7 21 41 20,0</td>
<td>2006.09.12 12:15</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>grab</td>
<td>1040</td>
<td>Golubac / Koronin</td>
<td>R</td>
<td>44 39 40,8 21 41 2,6</td>
<td>2006.09.12 12:00</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>grab</td>
<td>1022</td>
<td>Dobra Lubcova</td>
<td>L</td>
<td>44 38 59,9 21 53 51,3</td>
<td>2006.09.12 14:10</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>grab</td>
<td>1022</td>
<td>Dobra Lubcova</td>
<td>R</td>
<td>44 38 38,7 21 52 56,4</td>
<td>2006.09.12 14:00</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>grab</td>
<td>991</td>
<td>Donji Milanovac</td>
<td>L</td>
<td>44 28 45,4 22 08 35,8</td>
<td>2006.09.13 10:30</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>grab</td>
<td>991</td>
<td>Donji Milanovac</td>
<td>R</td>
<td>44 27 56,3 22 08 15,1</td>
<td>2006.09.13 9:30</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>core</td>
<td>991</td>
<td>Donji Milanovac</td>
<td>L</td>
<td>44 28 45,4 22 08 35,8</td>
<td>2006.09.13 12:00</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0-10 cm</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10-20 cm</td>
<td></td>
</tr>
<tr>
<td>Iron Gates sample number</td>
<td>Sample type</td>
<td>Km index</td>
<td>Location</td>
<td>Location in Profile</td>
<td>GPS Coordinates</td>
<td>Sampling Date [MM/DD/YYYY]</td>
<td>S. Time [HH:MM]</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------</td>
<td>----------</td>
<td>----------</td>
<td>---------------------</td>
<td>----------------</td>
<td>-----------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>-</td>
<td></td>
<td>20-30 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td>30-40 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td>40-50 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td>50-60 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td>60-70 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td>70-74 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>core</td>
<td>991 Donji Milanovac</td>
<td>R 44 27 56,3 22 08 15,1</td>
<td>2006.09.13</td>
<td>9:45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td>0-10 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td>10-20 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td>20-30 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td>30-40 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td>40-50 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td>50-60 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td>60-67 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-</td>
<td></td>
<td>0-10 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*no sediment found on the left side*

| grab 971 Dubova | R 44 36 23,0 22 16 24,6 | 2006.09.13 | 11:40 |
| grab 956 Tekija / Orsova | R 44 41 03,4 22 24 26,1 | 2006.09.13 | 13:20 |
| core 956 Tekija / Orsova | R 44 41 03.8 22 24 26,7 | 2006.09.13 | 13:30 |

UNDP/GEF DANUBE REGIONAL PROJECT
<table>
<thead>
<tr>
<th>Iron Gates sample number</th>
<th>Sample type</th>
<th>Km index</th>
<th>Location</th>
<th>Location in Profile</th>
<th>GPS Coordinates</th>
<th>Sampling Date [MM/DD/YYYY]</th>
<th>S. Time [HH:MM]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10-20 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20-30 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>30-40 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40-50 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>50-60 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>60-70 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>70-82 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>grab</td>
<td>928</td>
<td>Mala Vrbica / Simian</td>
<td>L</td>
<td>44° 37' 12.1&quot; 22° 41' 06.9&quot;</td>
<td>2006.09.13</td>
<td>19:30</td>
</tr>
<tr>
<td>10</td>
<td>grab</td>
<td>928</td>
<td>Mala Vrbica / Simian</td>
<td>R</td>
<td>44° 36' 29.8&quot; 22° 40' 47.6&quot;</td>
<td>2006.09.13</td>
<td>19:00</td>
</tr>
<tr>
<td></td>
<td>core</td>
<td>928</td>
<td>Mala Vrbica / Simian</td>
<td>R</td>
<td>44° 36' 29.8&quot; 22° 40' 47.6&quot;</td>
<td>2006.09.13</td>
<td>19:00</td>
</tr>
</tbody>
</table>
### TABLE 2: ANALYTICAL RESULTS OF THE SEDIMENT INVESTIGATION

<table>
<thead>
<tr>
<th>Sample code</th>
<th>Components</th>
<th>Unit</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1107-L</td>
<td>Fluoranthene</td>
<td>µg/kg</td>
<td>86</td>
</tr>
<tr>
<td>1-1107-R</td>
<td></td>
<td></td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>Benzo(b)fluoranthene</td>
<td>µg/kg</td>
<td>143</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>136</td>
</tr>
<tr>
<td></td>
<td>Benzo(k)fluoranthene</td>
<td>µg/kg</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>88</td>
</tr>
<tr>
<td></td>
<td>Benzo(a)pyrene</td>
<td>µg/kg</td>
<td>114</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>103</td>
</tr>
<tr>
<td></td>
<td>Indeno(1,2,3)pyrene</td>
<td>µg/kg</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>Benzo(g,h,i)perylene</td>
<td>µg/kg</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>PCB-28</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td>PCB-52</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td>PCB-101</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td>PCB-118</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td>PCB-138</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td>PCB-153</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td>PCB-180</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td>Aldrin</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td>Dieldrin</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td>Endrin</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td>DDT</td>
<td>µg/kg</td>
<td>2,1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,5</td>
</tr>
<tr>
<td></td>
<td>Lindane</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;1</td>
</tr>
<tr>
<td></td>
<td>Octylphenol</td>
<td>µg/kg</td>
<td>&lt;5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;5</td>
</tr>
<tr>
<td></td>
<td>Nonyphenol</td>
<td>µg/kg</td>
<td>89</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>86</td>
</tr>
<tr>
<td></td>
<td>Pentachlorophenol</td>
<td>µg/kg</td>
<td>&lt;5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;5</td>
</tr>
<tr>
<td></td>
<td>TPH</td>
<td>mg/kg</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>DEPH</td>
<td>mg/kg</td>
<td>&lt;0,1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0,2</td>
</tr>
<tr>
<td></td>
<td>Mercury</td>
<td>mg/kg</td>
<td>0,25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0,28</td>
</tr>
<tr>
<td></td>
<td>Arsenic</td>
<td>mg/kg</td>
<td>13,5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>14,2</td>
</tr>
<tr>
<td></td>
<td>Cadmium</td>
<td>mg/kg</td>
<td>2,6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3,0</td>
</tr>
<tr>
<td></td>
<td>Lead</td>
<td>mg/kg</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>Copper</td>
<td>mg/kg</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>Zinc</td>
<td>mg/kg</td>
<td>247</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>288</td>
</tr>
<tr>
<td></td>
<td>Chromium</td>
<td>mg/kg</td>
<td>58</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>66</td>
</tr>
<tr>
<td></td>
<td>Nickel</td>
<td>mg/kg</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>Total phosphorus</td>
<td>mg/kg</td>
<td>1159</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1173</td>
</tr>
<tr>
<td></td>
<td>Organic nitrogen</td>
<td>mg/kg</td>
<td>2228</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1948</td>
</tr>
<tr>
<td>Sample code</td>
<td>Unit</td>
<td>Concentration</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>----------</td>
<td>---------------</td>
<td></td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>µg/kg</td>
<td>132 84</td>
<td></td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>µg/kg</td>
<td>303 108</td>
<td></td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>µg/kg</td>
<td>153 56</td>
<td></td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>µg/kg</td>
<td>204 73</td>
<td></td>
</tr>
<tr>
<td>Indeno(1,2,3 )pyrene</td>
<td>µg/kg</td>
<td>107 49</td>
<td></td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>µg/kg</td>
<td>51 25</td>
<td></td>
</tr>
<tr>
<td>PCB-28</td>
<td>µg/kg</td>
<td>&lt;1 &lt;1</td>
<td></td>
</tr>
<tr>
<td>PCB-52</td>
<td>µg/kg</td>
<td>&lt;1 &lt;1</td>
<td></td>
</tr>
<tr>
<td>PCB-101</td>
<td>µg/kg</td>
<td>&lt;1 &lt;1</td>
<td></td>
</tr>
<tr>
<td>PCB-118</td>
<td>µg/kg</td>
<td>&lt;1 &lt;1</td>
<td></td>
</tr>
<tr>
<td>PCB-138</td>
<td>µg/kg</td>
<td>&lt;1 &lt;1</td>
<td></td>
</tr>
<tr>
<td>PCB-153</td>
<td>µg/kg</td>
<td>&lt;1 &lt;1</td>
<td></td>
</tr>
<tr>
<td>PCB-180</td>
<td>µg/kg</td>
<td>&lt;1 &lt;1</td>
<td></td>
</tr>
<tr>
<td>Aldrin</td>
<td>µg/kg</td>
<td>&lt; 1 &lt; 1</td>
<td></td>
</tr>
<tr>
<td>Dieldrin</td>
<td>µg/kg</td>
<td>&lt; 1 &lt; 1</td>
<td></td>
</tr>
<tr>
<td>Endrin</td>
<td>µg/kg</td>
<td>&lt; 1 &lt; 1</td>
<td></td>
</tr>
<tr>
<td>DDT</td>
<td>µg/kg</td>
<td>2 &lt; 1</td>
<td></td>
</tr>
<tr>
<td>Lindane</td>
<td>µg/kg</td>
<td>&lt; 1 &lt; 1</td>
<td></td>
</tr>
<tr>
<td>Octylphenol</td>
<td>µg/kg</td>
<td>&lt;5 &lt;5</td>
<td></td>
</tr>
<tr>
<td>Nonyphenol</td>
<td>µg/kg</td>
<td>64 96</td>
<td></td>
</tr>
<tr>
<td>Pentachlorphenol</td>
<td>µg/kg</td>
<td>&lt;5 &lt;5</td>
<td></td>
</tr>
<tr>
<td>TPH</td>
<td>mg/kg</td>
<td>16 29</td>
<td></td>
</tr>
<tr>
<td>DEPH</td>
<td>mg/kg</td>
<td>0,26 0,53</td>
<td></td>
</tr>
<tr>
<td>Mercury</td>
<td>mg/kg</td>
<td>0,27 0,25</td>
<td></td>
</tr>
<tr>
<td>Arsenic</td>
<td>mg/kg</td>
<td>16,4 18,8</td>
<td></td>
</tr>
<tr>
<td>Cadmium</td>
<td>mg/kg</td>
<td>3,0 3,0</td>
<td></td>
</tr>
<tr>
<td>Lead</td>
<td>mg/kg</td>
<td>67 82</td>
<td></td>
</tr>
<tr>
<td>Copper</td>
<td>mg/kg</td>
<td>66 49</td>
<td></td>
</tr>
<tr>
<td>Zinc</td>
<td>mg/kg</td>
<td>284 282</td>
<td></td>
</tr>
<tr>
<td>Chromium</td>
<td>mg/kg</td>
<td>69 100</td>
<td></td>
</tr>
<tr>
<td>Nickel</td>
<td>mg/kg</td>
<td>71 143</td>
<td></td>
</tr>
<tr>
<td>Total phosphorus</td>
<td>mg/kg</td>
<td>1335 1196</td>
<td></td>
</tr>
<tr>
<td>Organic nitrogen</td>
<td>mg/kg</td>
<td>2450 1765</td>
<td></td>
</tr>
<tr>
<td>Components</td>
<td>Unit</td>
<td>Concentration</td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------</td>
<td>---------------</td>
<td></td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>µg/kg</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>µg/kg</td>
<td>139</td>
<td></td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>µg/kg</td>
<td>86</td>
<td></td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>µg/kg</td>
<td>105</td>
<td></td>
</tr>
<tr>
<td>Indeno(1,2,3)pyrene</td>
<td>µg/kg</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>µg/kg</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>PCB-28</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td></td>
</tr>
<tr>
<td>PCB-52</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td></td>
</tr>
<tr>
<td>PCB-101</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td></td>
</tr>
<tr>
<td>PCB-118</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td></td>
</tr>
<tr>
<td>PCB-138</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td></td>
</tr>
<tr>
<td>PCB-153</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td></td>
</tr>
<tr>
<td>PCB-180</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td></td>
</tr>
<tr>
<td>Aldrin</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td></td>
</tr>
<tr>
<td>Dieldrin</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td></td>
</tr>
<tr>
<td>Endrin</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td></td>
</tr>
<tr>
<td>DDT</td>
<td>µg/kg</td>
<td>1,4</td>
<td></td>
</tr>
<tr>
<td>Lindane</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td></td>
</tr>
<tr>
<td>Octylphenol</td>
<td>µg/kg</td>
<td>&lt;5</td>
<td></td>
</tr>
<tr>
<td>Nonyphenol</td>
<td>µg/kg</td>
<td>87</td>
<td></td>
</tr>
<tr>
<td>Pentachlorophenol</td>
<td>µg/kg</td>
<td>&lt;5</td>
<td></td>
</tr>
<tr>
<td>TPH</td>
<td>mg/kg</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>DEPH</td>
<td>mg/kg</td>
<td>0,14</td>
<td></td>
</tr>
<tr>
<td>Mercury</td>
<td>mg/kg</td>
<td>0,27</td>
<td></td>
</tr>
<tr>
<td>Arsenic</td>
<td>mg/kg</td>
<td>14,4</td>
<td></td>
</tr>
<tr>
<td>Cadmium</td>
<td>mg/kg</td>
<td>2,8</td>
<td></td>
</tr>
<tr>
<td>Lead</td>
<td>mg/kg</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>Copper</td>
<td>mg/kg</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>Zinc</td>
<td>mg/kg</td>
<td>275</td>
<td></td>
</tr>
<tr>
<td>Chromium</td>
<td>mg/kg</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>Nickel</td>
<td>mg/kg</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>Total phosphorus</td>
<td>mg/kg</td>
<td>1248</td>
<td></td>
</tr>
<tr>
<td>Organic nitrogen</td>
<td>mg/kg</td>
<td>2344</td>
<td></td>
</tr>
<tr>
<td>Sample code</td>
<td>4-1061-L</td>
<td>4-1061-R</td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td>----------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>Components</td>
<td>Unit</td>
<td>Concentration</td>
<td></td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>µg/kg</td>
<td>114</td>
<td>93</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>µg/kg</td>
<td>343</td>
<td>236</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>µg/kg</td>
<td>168</td>
<td>122</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>µg/kg</td>
<td>242</td>
<td>146</td>
</tr>
<tr>
<td>Indeno(1,2,3 )pyrene</td>
<td>µg/kg</td>
<td>119</td>
<td>61</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>µg/kg</td>
<td>57</td>
<td>30</td>
</tr>
<tr>
<td>PCB-28</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-52</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-101</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-118</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-138</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-153</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-180</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Aldrin</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Endrin</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>DDT</td>
<td>µg/kg</td>
<td>1,6</td>
<td>1,1</td>
</tr>
<tr>
<td>Lindane</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Octylphenol</td>
<td>µg/kg</td>
<td>&lt;5</td>
<td>&lt;5</td>
</tr>
<tr>
<td>Nonphenol</td>
<td>µg/kg</td>
<td>53</td>
<td>260</td>
</tr>
<tr>
<td>Pentachlorphenol</td>
<td>µg/kg</td>
<td>&lt;5</td>
<td>&lt;5</td>
</tr>
<tr>
<td>TPH</td>
<td>mg/kg</td>
<td>41</td>
<td>22</td>
</tr>
<tr>
<td>DEPH</td>
<td>mg/kg</td>
<td>0,3</td>
<td>0,27</td>
</tr>
<tr>
<td>Mercury</td>
<td>mg/kg</td>
<td>0,30</td>
<td>0,36</td>
</tr>
<tr>
<td>Arsenic</td>
<td>mg/kg</td>
<td>16,3</td>
<td>22,6</td>
</tr>
<tr>
<td>Cadmium</td>
<td>mg/kg</td>
<td>3,0</td>
<td>3,5</td>
</tr>
<tr>
<td>Lead</td>
<td>mg/kg</td>
<td>69</td>
<td>93</td>
</tr>
<tr>
<td>Copper</td>
<td>mg/kg</td>
<td>64</td>
<td>60</td>
</tr>
<tr>
<td>Zinc</td>
<td>mg/kg</td>
<td>286</td>
<td>320</td>
</tr>
<tr>
<td>Chromium</td>
<td>mg/kg</td>
<td>78</td>
<td>127</td>
</tr>
<tr>
<td>Nickel</td>
<td>mg/kg</td>
<td>68</td>
<td>147</td>
</tr>
<tr>
<td>Total phosphorus</td>
<td>mg/kg</td>
<td>1306</td>
<td>1245</td>
</tr>
<tr>
<td>Organic nitrogen</td>
<td>mg/kg</td>
<td>1676</td>
<td>1946</td>
</tr>
<tr>
<td>Sample code</td>
<td>5-1040-L</td>
<td>5-1040-R</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>----------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td>Components</td>
<td>Unit</td>
<td>Concentration</td>
<td></td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>µg/kg</td>
<td>84</td>
<td>54</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>µg/kg</td>
<td>90</td>
<td>89</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>µg/kg</td>
<td>50</td>
<td>47</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>µg/kg</td>
<td>59</td>
<td>57</td>
</tr>
<tr>
<td>Indeno(1,2,3)pyrene</td>
<td>µg/kg</td>
<td>49</td>
<td>102</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>µg/kg</td>
<td>24</td>
<td>49</td>
</tr>
<tr>
<td>PCB-28</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-52</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-101</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-118</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-138</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-153</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-180</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Aldrin</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Endrin</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>DDT</td>
<td>µg/kg</td>
<td>1</td>
<td>1,4</td>
</tr>
<tr>
<td>Lindane</td>
<td>µg/kg</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Octylphenol</td>
<td>µg/kg</td>
<td>&lt;5</td>
<td>&lt;5</td>
</tr>
<tr>
<td>Nonyphenol</td>
<td>µg/kg</td>
<td>60</td>
<td>120</td>
</tr>
<tr>
<td>Pentachlorphenol</td>
<td>µg/kg</td>
<td>&lt;5</td>
<td>&lt;5</td>
</tr>
<tr>
<td>TPH</td>
<td>mg/kg</td>
<td>29</td>
<td>23</td>
</tr>
<tr>
<td>DEPH</td>
<td>mg/kg</td>
<td>0,29</td>
<td>0,46</td>
</tr>
<tr>
<td>Mercury</td>
<td>mg/kg</td>
<td>0,21</td>
<td>0,31</td>
</tr>
<tr>
<td>Arsenic</td>
<td>mg/kg</td>
<td>32,0</td>
<td>20,5</td>
</tr>
<tr>
<td>Cadmium</td>
<td>mg/kg</td>
<td>2,9</td>
<td>3,4</td>
</tr>
<tr>
<td>Lead</td>
<td>mg/kg</td>
<td>67</td>
<td>80</td>
</tr>
<tr>
<td>Copper</td>
<td>mg/kg</td>
<td>377</td>
<td>64</td>
</tr>
<tr>
<td>Zinc</td>
<td>mg/kg</td>
<td>279</td>
<td>326</td>
</tr>
<tr>
<td>Chromium</td>
<td>mg/kg</td>
<td>60</td>
<td>94</td>
</tr>
<tr>
<td>Nickel</td>
<td>mg/kg</td>
<td>59</td>
<td>104</td>
</tr>
<tr>
<td>Total phosphorus</td>
<td>mg/kg</td>
<td>1193</td>
<td>1283</td>
</tr>
<tr>
<td>Organic nitrogen</td>
<td>mg/kg</td>
<td>1431</td>
<td>2208</td>
</tr>
</tbody>
</table>
### Sample code 6-1022-L 6-1022-R

<table>
<thead>
<tr>
<th>Components</th>
<th>Unit</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoranthene</td>
<td>µg/kg</td>
<td>39</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>µg/kg</td>
<td>57</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>µg/kg</td>
<td>36</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>µg/kg</td>
<td>39</td>
</tr>
<tr>
<td>Indeno(1,2,3)pyrene</td>
<td>µg/kg</td>
<td>31</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>µg/kg</td>
<td>11</td>
</tr>
<tr>
<td>PCB-28</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-52</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-101</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-118</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-138</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-153</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-180</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Aldrin</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Endrin</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>DDT</td>
<td>µg/kg</td>
<td>1,6</td>
</tr>
<tr>
<td>Lindane</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Octylphenol</td>
<td>µg/kg</td>
<td>&lt;5</td>
</tr>
<tr>
<td>Nonyphenol</td>
<td>µg/kg</td>
<td>48</td>
</tr>
<tr>
<td>Pentachlorphenol</td>
<td>µg/kg</td>
<td>&lt;5</td>
</tr>
<tr>
<td>TPH</td>
<td>mg/kg</td>
<td>34</td>
</tr>
<tr>
<td>DEPH</td>
<td>mg/kg</td>
<td>0,11</td>
</tr>
<tr>
<td>Mercury</td>
<td>mg/kg</td>
<td>0,17</td>
</tr>
<tr>
<td>Arsenic</td>
<td>mg/kg</td>
<td>12,5</td>
</tr>
<tr>
<td>Cadmium</td>
<td>mg/kg</td>
<td>2,3</td>
</tr>
<tr>
<td>Lead</td>
<td>mg/kg</td>
<td>53</td>
</tr>
<tr>
<td>Copper</td>
<td>mg/kg</td>
<td>70</td>
</tr>
<tr>
<td>Zinc</td>
<td>mg/kg</td>
<td>211</td>
</tr>
<tr>
<td>Chromium</td>
<td>mg/kg</td>
<td>60</td>
</tr>
<tr>
<td>Nickel</td>
<td>mg/kg</td>
<td>55</td>
</tr>
<tr>
<td>Total phosphorus</td>
<td>mg/kg</td>
<td>1343</td>
</tr>
<tr>
<td>Organic nitrogen</td>
<td>mg/kg</td>
<td>2313</td>
</tr>
<tr>
<td>Mercury</td>
<td>mg/kg</td>
<td>1245</td>
</tr>
<tr>
<td>Cadmium</td>
<td>mg/kg</td>
<td>2308</td>
</tr>
<tr>
<td>Components</td>
<td>Unit</td>
<td>Concentration</td>
</tr>
<tr>
<td>----------------------------</td>
<td>--------</td>
<td>---------------</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>µg/kg</td>
<td>77</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>µg/kg</td>
<td>301</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>µg/kg</td>
<td>150</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>µg/kg</td>
<td>198</td>
</tr>
<tr>
<td>Indeno(1,2,3)pyrene</td>
<td>µg/kg</td>
<td>105</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>µg/kg</td>
<td>50</td>
</tr>
<tr>
<td>PCB-28</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-52</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-101</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-118</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-138</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-153</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>PCB-180</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Aldrin</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Endrin</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>DDT</td>
<td>µg/kg</td>
<td>1.6</td>
</tr>
<tr>
<td>Lindane</td>
<td>µg/kg</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Octylphenol</td>
<td>µg/kg</td>
<td>&lt;5</td>
</tr>
<tr>
<td>Nonyphenol</td>
<td>µg/kg</td>
<td>57</td>
</tr>
<tr>
<td>Pentachlorophenol</td>
<td>µg/kg</td>
<td>&lt;5</td>
</tr>
<tr>
<td>TPH</td>
<td>mg/kg</td>
<td>15</td>
</tr>
<tr>
<td>DEPH</td>
<td>mg/kg</td>
<td>0.28</td>
</tr>
<tr>
<td>Mercury</td>
<td>mg/kg</td>
<td>0.27</td>
</tr>
<tr>
<td>Arsenic</td>
<td>mg/kg</td>
<td>17.7</td>
</tr>
<tr>
<td>Cadmium</td>
<td>mg/kg</td>
<td>2.7</td>
</tr>
<tr>
<td>Lead</td>
<td>mg/kg</td>
<td>69</td>
</tr>
<tr>
<td>Copper</td>
<td>mg/kg</td>
<td>75</td>
</tr>
<tr>
<td>Zinc</td>
<td>mg/kg</td>
<td>293</td>
</tr>
<tr>
<td>Chromium</td>
<td>mg/kg</td>
<td>75</td>
</tr>
<tr>
<td>Nickel</td>
<td>mg/kg</td>
<td>91</td>
</tr>
<tr>
<td>Total phosphorus</td>
<td>mg/kg</td>
<td>1315</td>
</tr>
<tr>
<td>Organic nitrogen</td>
<td>mg/kg</td>
<td>1972</td>
</tr>
</tbody>
</table>

Sample code   7-990-L  7-990-R
<table>
<thead>
<tr>
<th>Sample code</th>
<th>8-971 R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Components</td>
<td>Unit</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Indeno(1,2,3)pyrene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-28</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-52</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-101</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-118</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-138</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-153</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-180</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Aldrin</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Endrin</td>
<td>µg/kg</td>
</tr>
<tr>
<td>DDT</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Lindane</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Octylphenol</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Nonyphenol</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Pentachlorphenol</td>
<td>µg/kg</td>
</tr>
<tr>
<td>TPH</td>
<td>mg/kg</td>
</tr>
<tr>
<td>DEPH</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Mercury</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Arsenic</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Cadmium</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Lead</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Copper</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Zinc</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Chromium</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Nickel</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Total phosphorus</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Organic nitrogen</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Sample code</td>
<td>9-956-L</td>
</tr>
<tr>
<td>-------------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>Components</strong></td>
<td><strong>Unit</strong></td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Indeno(1,2,3)pyrene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-28</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-52</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-101</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-118</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-138</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-153</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-180</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Aldrin</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Endrin</td>
<td>µg/kg</td>
</tr>
<tr>
<td>DDT</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Lindane</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Octylphenol</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Nonylphenol</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Pentachlorophenol</td>
<td>µg/kg</td>
</tr>
<tr>
<td>TPH</td>
<td>mg/kg</td>
</tr>
<tr>
<td>DEPH</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Mercury</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Arsenic</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Cadmium</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Lead</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Copper</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Zinc</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Chromium</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Nickel</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Total phosphorus</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Organic nitrogen</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Sample code</td>
<td>Unit</td>
</tr>
<tr>
<td>-------------</td>
<td>------------</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Indeno(1,2,3)pyrene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-28</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-52</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-101</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-118</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-138</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-153</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-180</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Aldrin</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Endrin</td>
<td>µg/kg</td>
</tr>
<tr>
<td>DDT</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Lindane</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Octyphenol</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Nonyphenol</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Pentachlorphenol</td>
<td>µg/kg</td>
</tr>
<tr>
<td>TPH</td>
<td>mg/kg</td>
</tr>
<tr>
<td>DEPH</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Mercury</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Arsenic</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Cadmium</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Lead</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Copper</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Zinc</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Chromium</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Nickel</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Total phosphorus</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Organic nitrogen</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Sample code</td>
<td>1077-R</td>
</tr>
<tr>
<td>-------------</td>
<td>--------</td>
</tr>
<tr>
<td>Components</td>
<td>Unit Concentration</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>µg/kg 127 105 136 169 348 395 339 269</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>µg/kg 221 135 195 444 602 1075 605 756</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>µg/kg 129 81 120 287 324 553 323 390</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>µg/kg 166 90 137 317 429 746 429 521</td>
</tr>
<tr>
<td>Indeno(1,2,3)pyrene</td>
<td>µg/kg 111 65 103 244 283 579 296 368</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>µg/kg 39 23 35 84 93 188 94 116</td>
</tr>
<tr>
<td>PCB-28</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 1,0 1,6 1,6 2,7</td>
</tr>
<tr>
<td>PCB-52</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1</td>
</tr>
<tr>
<td>PCB-101</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1</td>
</tr>
<tr>
<td>PCB-118</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1</td>
</tr>
<tr>
<td>PCB-138</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 1,3 1,2 1,4 1,7</td>
</tr>
<tr>
<td>PCB-153</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 1,6 1,5 2,0 1,7</td>
</tr>
<tr>
<td>PCB-180</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 1,7 2,0 1,8 1,7</td>
</tr>
<tr>
<td>Aldrin</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1</td>
</tr>
<tr>
<td>Endrin</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1</td>
</tr>
<tr>
<td>DDT</td>
<td>µg/kg 1,1 &lt;1 1,1 1,3 1,1 1,6 1,4 2,1</td>
</tr>
<tr>
<td>Lindane</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1</td>
</tr>
<tr>
<td>Octylphenol</td>
<td>µg/kg &lt;5 &lt;5 &lt;5 &lt;5 &lt;5 19 7,2 8,8</td>
</tr>
<tr>
<td>Nonylphenol</td>
<td>µg/kg 300 140 580 1600 4800 11000 5400 3600</td>
</tr>
<tr>
<td>Pentachlorophenol</td>
<td>µg/kg &lt;5 &lt;5 &lt;5 &lt;5 &lt;5 &lt;5 &lt;5 &lt;5</td>
</tr>
<tr>
<td>TPH</td>
<td>mg/kg 68 49 108 49 123 220 197 76</td>
</tr>
<tr>
<td>DEPH</td>
<td>mg/kg 0,47 0,27 0,45 0,49 0,74 0,84 0,47 0,56</td>
</tr>
<tr>
<td>Mercury</td>
<td>mg/kg 0,36 0,35 0,49 0,64 1,05 1,46 1,50 1,36</td>
</tr>
<tr>
<td>Arsenic</td>
<td>mg/kg 16,7 18,6 18,7 19,7 27,6 33,3 36,1 58,1</td>
</tr>
<tr>
<td>Cadmium</td>
<td>mg/kg 3,1 3,4 4,0 4,6 6,7 9,1 7,1 6,1</td>
</tr>
<tr>
<td>Lead</td>
<td>mg/kg 74 77 85 109 151 197 176 168</td>
</tr>
<tr>
<td>Copper</td>
<td>mg/kg 54 51 56 65 80 84 72 68</td>
</tr>
<tr>
<td>Zinc</td>
<td>mg/kg 292 309 349 446 619 727 682 589</td>
</tr>
<tr>
<td>Chromium</td>
<td>mg/kg 89 122 101 105 138 151 174 126</td>
</tr>
<tr>
<td>Nickel</td>
<td>mg/kg 105 121 106 104 116 113 133 110</td>
</tr>
<tr>
<td>Total phosphorus</td>
<td>mg/kg 1149 1117 1245 1247 1453 1497 1505 1315</td>
</tr>
<tr>
<td>Organic nitrogen</td>
<td>mg/kg 2065 1675 1952 1987 2301 2121 2165 2407</td>
</tr>
<tr>
<td>Sample code</td>
<td>Core</td>
</tr>
<tr>
<td>-------------</td>
<td>------</td>
</tr>
<tr>
<td>Components</td>
<td>Unit</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Indeno(1,2,3)pyrene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-28</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-52</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-101</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-118</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-138</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-153</td>
<td>µg/kg</td>
</tr>
<tr>
<td>PCB-180</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Aldrin</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Endrin</td>
<td>µg/kg</td>
</tr>
<tr>
<td>DDT</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Lindane</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Octylphenol</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Nonyphenol</td>
<td>µg/kg</td>
</tr>
<tr>
<td>Pentachlorphenol</td>
<td>µg/kg</td>
</tr>
<tr>
<td>TPH</td>
<td>mg/kg</td>
</tr>
<tr>
<td>DEPH</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Mercury</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Arsenic</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Cadmium</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Lead</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Copper</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Zinc</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Chromium</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Nickel</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Total phosphorus</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Organic nitrogen</td>
<td>mg/kg</td>
</tr>
<tr>
<td>Sample code</td>
<td>956-L</td>
</tr>
<tr>
<td>-------------</td>
<td>-------</td>
</tr>
<tr>
<td>Components</td>
<td>Unit Concentration</td>
</tr>
<tr>
<td>Fluoranthene</td>
<td>µg/kg 90 117 141 138 123 121 130 141</td>
</tr>
<tr>
<td>Benzo(b)fluoranthene</td>
<td>µg/kg 196 356 149 188 259 190 408 225</td>
</tr>
<tr>
<td>Benzo(k)fluoranthene</td>
<td>µg/kg 103 196 85 100 132 103 187 111</td>
</tr>
<tr>
<td>Benzo(a)pyrene</td>
<td>µg/kg 131 243 112 133 177 137 280 150</td>
</tr>
<tr>
<td>Indeno(1,2,3)pyrene</td>
<td>µg/kg 121 222 110 173 196 126 235 212</td>
</tr>
<tr>
<td>Benzo(g,h,i)perylene</td>
<td>µg/kg 41 75 60 84 92 63 115 96</td>
</tr>
<tr>
<td>PCB-28</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1</td>
</tr>
<tr>
<td>PCB-52</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1</td>
</tr>
<tr>
<td>PCB-101</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1</td>
</tr>
<tr>
<td>PCB-118</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1</td>
</tr>
<tr>
<td>PCB-138</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1</td>
</tr>
<tr>
<td>PCB-153</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1</td>
</tr>
<tr>
<td>PCB-180</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1</td>
</tr>
<tr>
<td>Aldrin</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1</td>
</tr>
<tr>
<td>Endrin</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1</td>
</tr>
<tr>
<td>DDT</td>
<td>µg/kg 1,5 1,4 1,3 1,5 1,3 1,3 1,3 1,2</td>
</tr>
<tr>
<td>Lindane</td>
<td>µg/kg &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1 &lt;1</td>
</tr>
<tr>
<td>Octylphenol</td>
<td>µg/kg &lt;5 &lt;5 &lt;5 &lt;5 &lt;5 &lt;5 &lt;5 &lt;5</td>
</tr>
<tr>
<td>Nonylphenol</td>
<td>µg/kg 120 280 260 310 320 240 680 370</td>
</tr>
<tr>
<td>Pentachlorophenol</td>
<td>µg/kg &lt;5 &lt;5 &lt;5 &lt;5 &lt;5 &lt;5 &lt;5 &lt;5</td>
</tr>
<tr>
<td>TPH</td>
<td>mg/kg 52 49 22 36 54 76 58 31</td>
</tr>
<tr>
<td>DEPH</td>
<td>mg/kg 0,45 0,4 0,32 0,32 0,27 0,5 0,17 0,23</td>
</tr>
<tr>
<td>Mercury</td>
<td>mg/kg 0,33 0,4 0,46 0,46 0,60 0,57 0,69 0,65</td>
</tr>
<tr>
<td>Arsenic</td>
<td>mg/kg 18,8 18,4 19,9 19,1 21,3 21,7 23,2 19,7</td>
</tr>
<tr>
<td>Cadmium</td>
<td>mg/kg 3,5 3,5 3,9 4,0 4,5 3,9 4,7 4,8</td>
</tr>
<tr>
<td>Lead</td>
<td>mg/kg 80 90 103 95 112 113 123 115</td>
</tr>
<tr>
<td>Copper</td>
<td>mg/kg 82 87 97 99 113 115 136 122</td>
</tr>
<tr>
<td>Zinc</td>
<td>mg/kg 350 365 391 376 416 392 466 437</td>
</tr>
<tr>
<td>Chromium</td>
<td>mg/kg 103 97 117 102 100 122 117 97</td>
</tr>
<tr>
<td>Nickel</td>
<td>mg/kg 97 95 94 88 98 100 91 90</td>
</tr>
<tr>
<td>Total phosphorus</td>
<td>mg/kg 1286 1582 1365 1470 1313 1332 1503 1387</td>
</tr>
<tr>
<td>Organic nitrogen</td>
<td>mg/kg 2321 2309 2305 2274 1986 2318 2297 2306</td>
</tr>
</tbody>
</table>
FIGURE 1. VERTICAL CONCENTRATION DISTRIBUTION OF DIFFERENT COMPONENTS IN CORE SAMPLE 1077 R

- **Fluoranthene**
  - 0-10 cm
  - 10-20 cm
  - 20-30 cm
  - 30-40 cm
  - 40-50 cm
  - 50-60 cm
  - 60-70 cm
  - 70-77 cm

- **Benzo(a)pyrene**
  - 0-10 cm
  - 10-20 cm
  - 20-30 cm
  - 30-40 cm
  - 40-50 cm
  - 50-60 cm
  - 60-70 cm
  - 70-77 cm

- **Benzo(b)fluoranthene**
  - 0-10 cm
  - 10-20 cm
  - 20-30 cm
  - 30-40 cm
  - 40-50 cm
  - 50-60 cm
  - 60-70 cm
  - 70-77 cm

- **Benzo(k)fluoranthene**
  - 0-10 cm
  - 10-20 cm
  - 20-30 cm
  - 30-40 cm
  - 40-50 cm
  - 50-60 cm
  - 60-70 cm
  - 70-77 cm

- **Indeno(1,2,3)pyrene**
  - 0-10 cm
  - 10-20 cm
  - 20-30 cm
  - 30-40 cm
  - 40-50 cm
  - 50-60 cm
  - 60-70 cm
  - 70-77 cm

- **Benzo(g,h,i)perylene**
  - 0-10 cm
  - 10-20 cm
  - 20-30 cm
  - 30-40 cm
  - 40-50 cm
  - 50-60 cm
  - 60-70 cm
  - 70-77 cm
FIGURE 2. VERTICAL CONCENTRATION DISTRIBUTION OF DIFFERENT COMPONENTS IN CORE SAMPLE 991

- **Fluoranthene**
- **Benzo(b)fluoranthene**
- **Benzo(k)fluoranthene**
- **Benzo(a)pyrene**
- **Indeno(1,2,3)pyrene**
- **Benzo(g,h,i)perylene**
FIGURE 3. VERTICAL CONCENTRATION DISTRIBUTION OF DIFFERENT COMPONENTS IN CORE SAMPLE 956

- **Fluoranthene**
  - 0-10 cm
  - 10-20 cm
  - 20-30 cm
  - 30-40 cm
  - 40-50 cm
  - 50-60 cm
  - 60-70 cm
  - 70-78 cm

- **Benzo(b)fluoranthene**
  - 0-10 cm
  - 10-20 cm
  - 20-30 cm
  - 30-40 cm
  - 40-50 cm
  - 50-60 cm
  - 60-70 cm
  - 70-78 cm

- **Benzo(k)fluoranthene**
  - 0-10 cm
  - 10-20 cm
  - 20-30 cm
  - 30-40 cm
  - 40-50 cm
  - 50-60 cm
  - 60-70 cm
  - 70-78 cm

- **Benzo(a)pyrene**
  - 0-10 cm
  - 10-20 cm
  - 20-30 cm
  - 30-40 cm
  - 40-50 cm
  - 50-60 cm
  - 60-70 cm
  - 70-78 cm

- **Indeno(1,2,3)pyrene**
  - 0-10 cm
  - 10-20 cm
  - 20-30 cm
  - 30-40 cm
  - 40-50 cm
  - 50-60 cm
  - 60-70 cm
  - 70-78 cm

- **Benzo(g,h,i)perylene**
  - 0-10 cm
  - 10-20 cm
  - 20-30 cm
  - 30-40 cm
  - 40-50 cm
  - 50-60 cm
  - 60-70 cm
  - 70-78 cm

The graphs show the concentration distribution of different components across various depth intervals (0-10 cm, 10-20 cm, etc.) with concentrations measured in µg/kg.
### FIGURE 4. PRACTICLE SIZE DISTRIBUTION OF SEDIMENT SAMPLES

<table>
<thead>
<tr>
<th>Sample code</th>
<th>(D_{60})</th>
<th>(D_{10})</th>
<th>(U)</th>
<th>Marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1107 R-HU</td>
<td>0,1</td>
<td>0,0043</td>
<td>23,3</td>
<td></td>
</tr>
<tr>
<td>L-HU</td>
<td>0,040</td>
<td>0,0034</td>
<td>11,8</td>
<td></td>
</tr>
<tr>
<td>2-1097 R-HU</td>
<td>0,041</td>
<td>0,0020</td>
<td>20,5</td>
<td></td>
</tr>
<tr>
<td>L-HU</td>
<td>0,090</td>
<td>0,0060</td>
<td>15,0</td>
<td></td>
</tr>
</tbody>
</table>
### Annex 1: Tables and Figures

**Crude** | **Tiny** | **Crude** | **Middle** | **Fine** | **Sandflour** | **Silt** | **Loam**
---|---|---|---|---|---|---|---
Gravel | Sand

<table>
<thead>
<tr>
<th>Sample code</th>
<th>$D_{60}$</th>
<th>$D_{10}$</th>
<th>$U$</th>
<th>Marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-1072 R-HU</td>
<td>0.050</td>
<td>0.0016</td>
<td>31.3</td>
<td></td>
</tr>
<tr>
<td>L-HU</td>
<td>0.026</td>
<td>0.0015</td>
<td>17.3</td>
<td></td>
</tr>
</tbody>
</table>

---

**Crude** | **Tiny** | **Crude** | **Middle** | **Fine** | **Sandflour** | **Silt** | **Loam**
---|---|---|---|---|---|---|---
Gravel | Sand

<table>
<thead>
<tr>
<th>Sample code</th>
<th>$D_{60}$</th>
<th>$D_{10}$</th>
<th>$U$</th>
<th>Marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-1061 R-HU</td>
<td>0.050</td>
<td>0.0012</td>
<td>41.7</td>
<td></td>
</tr>
<tr>
<td>L-HU</td>
<td>0.032</td>
<td>0.0014</td>
<td>22.9</td>
<td></td>
</tr>
</tbody>
</table>
### Grain Size Distribution

<table>
<thead>
<tr>
<th>Sample code</th>
<th>D&lt;sub&gt;60&lt;/sub&gt;</th>
<th>D&lt;sub&gt;10&lt;/sub&gt;</th>
<th>U</th>
<th>Marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-1040 R-HU</td>
<td>0.053</td>
<td>0.0015</td>
<td>35.3</td>
<td></td>
</tr>
<tr>
<td>L-HU</td>
<td>0.062</td>
<td>0.0048</td>
<td>12.9</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample code</th>
<th>D&lt;sub&gt;60&lt;/sub&gt;</th>
<th>D&lt;sub&gt;10&lt;/sub&gt;</th>
<th>U</th>
<th>Marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-1022 R-HU</td>
<td>0.028</td>
<td>0.0026</td>
<td>10.8</td>
<td></td>
</tr>
<tr>
<td>L-HU</td>
<td>0.043</td>
<td>0.0037</td>
<td>11.6</td>
<td></td>
</tr>
</tbody>
</table>
### Table

<table>
<thead>
<tr>
<th>Sample code</th>
<th>$D_{60}$</th>
<th>$D_{10}$</th>
<th>U</th>
<th>Marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-990 R-HU</td>
<td>0.026</td>
<td>0.0010</td>
<td>26.0</td>
<td></td>
</tr>
<tr>
<td>L-HU</td>
<td>0.030</td>
<td>0.0010</td>
<td>30.0</td>
<td>---------</td>
</tr>
</tbody>
</table>

### Diagram

Grain size $d$(mm)

<table>
<thead>
<tr>
<th>Sample code</th>
<th>$D_{60}$</th>
<th>$D_{10}$</th>
<th>U</th>
<th>Marking</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-971 R-HU</td>
<td>0.064</td>
<td>&lt; 0.0010</td>
<td>&gt; 64.0</td>
<td></td>
</tr>
</tbody>
</table>
### Crude Tiny Crude Middle Fine Sand Sandflour Silt Loam

<table>
<thead>
<tr>
<th>Grain size $d$ (mm)</th>
<th>Sample code</th>
<th>$D_{60}$</th>
<th>$D_{10}$</th>
<th>$U$</th>
<th>Marking</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9-956 R-HU</td>
<td>0.021</td>
<td>&lt; 0.0010</td>
<td>&gt; 21.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-HU</td>
<td>0.018</td>
<td>&lt; 0.0010</td>
<td>&gt; 18.0</td>
<td></td>
</tr>
</tbody>
</table>

### Crude Tiny Crude Middle Fine Sand Sandflour Silt Loam

<table>
<thead>
<tr>
<th>Grain size $d$ (mm)</th>
<th>Sample code</th>
<th>$D_{60}$</th>
<th>$D_{10}$</th>
<th>$U$</th>
<th>Marking</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10-924 R-HU</td>
<td>0.061</td>
<td>&lt; 0.0010</td>
<td>&gt; 61.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L-HU</td>
<td>0.046</td>
<td>0.0020</td>
<td>23.0</td>
<td></td>
</tr>
</tbody>
</table>
WORKING FOR THE DANUBE AND ITS PEOPLE

www.undp-drp.org