WATER QUALITY
IN THE RUSSIAN PART
OF THE IRTYSH RIVER
Irtysh Basin

- Irtysh Basin
  - Tobol
  - Ishim
  - Irtysh

- Irtysh River
  - Russia
    - 2041 km
  - Kazakhstan
    - 1589 km
  - Chine
    - 618 km
  - Mongolia
Irtysh Basin in Russia

- **Regions**
  - Chelyabinsk
  - Kurgan
  - Yekaterinburg
  - Tyumen
  - Hanty-Mansy
  - Omsk
  - Novosibirsk

- **Irtysh River**
  - Omsk
  - Tyumen
  - Hanty-Mansy
## Irtysh Basin in Russia

### Social-economic value

<table>
<thead>
<tr>
<th>Index</th>
<th>Years</th>
<th>Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population million of persons</td>
<td>11.18</td>
<td>11.04</td>
</tr>
<tr>
<td>Density of occupation person/sq.km</td>
<td>15.9</td>
<td>15.2</td>
</tr>
<tr>
<td>Industrial production billion rubles</td>
<td>n/d</td>
<td>1492.9</td>
</tr>
<tr>
<td>Agricultural production billion rubles</td>
<td>94.1</td>
<td>131.2</td>
</tr>
<tr>
<td>Capital investment billion rubles</td>
<td>116.5</td>
<td>266.9</td>
</tr>
</tbody>
</table>
Quality of water
the specific combinatorial index of water pollution

<table>
<thead>
<tr>
<th>River</th>
<th>Type</th>
<th>Index (УКИЗВ)</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irtysh</td>
<td>4A</td>
<td>4,1</td>
<td>Dirty</td>
</tr>
<tr>
<td>Ishim</td>
<td>4Б</td>
<td>4,9</td>
<td>Dirty</td>
</tr>
<tr>
<td>Tobol</td>
<td>4Б</td>
<td>5,6</td>
<td>Dirty</td>
</tr>
</tbody>
</table>

Discharge of sewage (million cubic meter per year)

<table>
<thead>
<tr>
<th></th>
<th>2007</th>
<th>2010 (quota)</th>
<th>2015 (quota)</th>
<th>2020 (quota)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2167.46</td>
<td>2681</td>
<td>2779</td>
<td>3003</td>
</tr>
</tbody>
</table>
Irtysh Basin in Russia

- Discharge of sewage in Omsk Region
  (million cubic meters per year)
Water quality in the Irtysh River

- **Index**
  - mg/l
  - PDK (maximum allowable concentration)

- **Control points**
  - Hanty-Mancy, downstream (8)
  - Hanty-Mancy, upstream (7)
  - Tobolsk, downstream (6)
  - Tobolsk, upstream (5)
  - Omsk-Tyumen regions border (4)
  - Omsk, downstream (3)
  - Omsk, upstream (2)
  - Kazak-Russia border (1)
Water quality in the KZ-RU border

![Graph showing Cu levels from 2006 to 2009, with a trend line indicating a decrease in Cu levels over time.]

- PDK
Water quality in the KZ-RU border
БПК₅ - biochemical oxygen demand (BOD)

- average annuals flow
- average annual flow (2007)
Water quality in the Irtysh River

- **Fe**
  - average annuals flow
  - average annual flow (2007)
Water quality in the Irtysh River

- **Cu & Phenol**
  - average annuals flow
  - average annual flow (2007)

![Graph showing water quality data for various locations along the Irtysh River, including Russia-Kazak border, Omsk, upstream, Omsk, downstream, Omsk-Tyumen regions border, Tobol, upstream, Tobol, downstream, Hanty-Mansi, upstream, and Hanty-Mansi, downstream. The graph includes a line indicating the PDK (Permissible Daily Dosage).]
Water quality in the Irtysh River

- Oil
  - average annuals flow
  - average annual flow (2007)
Water quality in the Irtysh River (2009)

- PDK
# Measures for water quality in Irtysh

## Sewage treatment factory in the cities
- million cubic meters per year for 2007 – 2020

<table>
<thead>
<tr>
<th></th>
<th>Maximum scenario</th>
<th>Optimum scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Million cubic m per year</td>
<td>430.1</td>
<td>355.5</td>
</tr>
<tr>
<td>Thou. cubic m per day</td>
<td>1178.4</td>
<td>974.3</td>
</tr>
</tbody>
</table>

## Rural sewage treatment factory
- million cubic meters per year for 2007 – 2020

<table>
<thead>
<tr>
<th></th>
<th>Maximum scenario</th>
<th>Optimum scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Million cubic m per year</td>
<td>167.5</td>
<td>136.6</td>
</tr>
<tr>
<td>Thou. cubic m per day</td>
<td>458.9</td>
<td>374</td>
</tr>
</tbody>
</table>
Thank you for your attention!

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