Safe, better tasting tap water project – Succession of safe and better tasting water to the next generation

The Bureau of Waterworks,
Tokyo Metropolitan Government, Japan
Goals of the Project

• Improving the degree of customer satisfaction with tap water
• Delivering tap water that more customers will drink

Thereby

• Ensuring that our culture of drinking tap water is passed on to the next generation
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Service area</td>
<td>1222.78 km²</td>
</tr>
<tr>
<td>Population served</td>
<td>12,554,106 people</td>
</tr>
<tr>
<td>Pervasion</td>
<td>100 %</td>
</tr>
<tr>
<td>Number of service connections</td>
<td>6,831,308 cases</td>
</tr>
<tr>
<td>Total length of distribution pipes</td>
<td>25,823 km</td>
</tr>
<tr>
<td>Total capacity of facilities</td>
<td>6,859,500 m³/day</td>
</tr>
<tr>
<td>Total distribution amount per year</td>
<td>1,581,925 × 10³ m³</td>
</tr>
<tr>
<td>Maximum distribution amount per day</td>
<td>4,824,000 m³/day</td>
</tr>
<tr>
<td>Ave. distribution amount per day</td>
<td>4,334,000 m³/day</td>
</tr>
</tbody>
</table>

(note) Service area, population served, pervasion and number of service connections are numbers as of October 1st, 2008
Change in degree of customer satisfaction

Promotion plan for returning to the tap water (2007 ~ 2009)

- 2003
  - Satisfied 28.1%
  - Dissatisfied 50.4%
  - Neither 20.9%
  - Not using for drinking 11.3%

- 2006
  - Satisfied 34.4%
  - Dissatisfied 34.0%
  - Neither 19.7%
  - Not using for drinking 10.2%

- 2009
  - Satisfied 46.6%
  - Dissatisfied 16.7%
  - Neither 19.7%
  - Not using for drinking 10.2%

6.3 point increase
12.2 point increase

Promotion plan (2004 ~ 2006)
Four actions

1. Producing safer and better tasting water
2. Delivering of high quality water to the tap
3. Publicizing the overall quality of tap water
4. Reflecting customers' voice concerning measures for high quality water
1 Producing safer and better tasting water

■ Adoption of the advanced water treatment system

■ Thorough water quality management
  • Management of the water quality target for better tasting water
  • Implementation of the Tokyo High Quality Management Program

■ Proper management of the water conservation forest

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Adoption of the advanced water treatment system

Raw water → Condensed sedimentation → Ozonation → Biological activated carbon absorption treatment → Sand filtration → Purification

Advanced water treatment system

<table>
<thead>
<tr>
<th>Purification plants</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higashimurayama</td>
<td>Completion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kanamachi (The third term)</td>
<td></td>
<td>Completion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Misato (The second term)</td>
<td></td>
<td></td>
<td>Completion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asaka (The second term)</td>
<td></td>
<td></td>
<td></td>
<td>Completion</td>
<td></td>
</tr>
</tbody>
</table>

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# Thorough water quality management

- Management of the water quality target for better tasting water

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>National Water Quality Standard etc</th>
<th>Objectives</th>
<th>Achievement rate in fiscal year 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorine odor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residual chlorine</td>
<td>mg/L</td>
<td>1.0 (MAX) 0.1 (MIN)</td>
<td>Most people don’t sense the odor of chlorine (the smell of chlorine) used for disinfection.</td>
<td>61.7%</td>
</tr>
<tr>
<td>Trichloroamine</td>
<td>mg/L</td>
<td>–</td>
<td>Most people don’t sense the chlorine odor.</td>
<td>84.6%</td>
</tr>
<tr>
<td>Odor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Threshold odor number (TON)</td>
<td>–</td>
<td>3 (MAX)</td>
<td>People don’t sense an offensive taste or odor (other than the chlorine odor).</td>
<td>100%</td>
</tr>
<tr>
<td>Musty odorant</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-Methylisoborneol</td>
<td>ng/L</td>
<td>10 (MAX)</td>
<td>People don’t sense a musty odor.</td>
<td>100%</td>
</tr>
<tr>
<td>Geosmin</td>
<td>ng/L</td>
<td>10 (MAX)</td>
<td>People don’t sense a musty odor.</td>
<td>100%</td>
</tr>
<tr>
<td>Taste</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organic substances</td>
<td>mg/L</td>
<td>3 (MAX)</td>
<td>People don’t sense an unpleasant taste</td>
<td>100%</td>
</tr>
<tr>
<td>(Total Organic Carbon)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appearance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>degree</td>
<td>5 (MAX)</td>
<td>People don’t notice the color and turbidity of the water.</td>
<td>100%</td>
</tr>
<tr>
<td>Turbidity</td>
<td>degree</td>
<td>2 (MAX)</td>
<td></td>
<td>99.6%</td>
</tr>
</tbody>
</table>
Thorough water quality management

- Management of the water quality target for better tasting water

- High quality management in accordance with ISO9001

- Intensive water quality inspection in accordance with ISO/IEC17025

- Risk management with the water safety plan
Proper management of the water conservation forest
Four actions

1. Producing safer and better tasting water
2. Delivering high quality water to the tap
3. Publicizing the overall quality of tap water
4. Reflecting customers' voice concerning measures for high quality water
2 Delivering high quality water to the tap

- Planned exchange of pipes
- Achieving proper administration of water supply facilities with receiving tanks
- Promotion of direct water service
  - Diffusion and promotion of a direct water service system
  - Promotion of model projects for direct drinking water supply taps in public elementary and junior high schools
- Reduction of residual chlorine
  - Proper management of residual chlorine
  - Additional injection of chlorine at water stations
Planned exchange of pipes
Achieving proper administration of water supply facilities with receiving tanks
Promotion of direct water service

- Diffusion and promotion of a direct water service system

Receiving tank system

Direct water service system

Elevated tank

Pressure water service system

Direct water supply service system

Transmission pump

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Promotion of direct water service

- Promotion of model projects for direct drinking water supply taps in elementary and junior high schools
Reduction of residual chlorine

- Proper management of residual chlorine

  The concentration of residual chlorine is limited between the minimum amount of 0.1mg/L and 0.4mg/L.

- Additional injection of chlorine at water stations

Water quality target
(0.1mg/L and 0.4mg/L)
Four actions

1. Producing safer and better tasting water
2. Delivering high quality water to the tap
3. Publicizing the overall quality of tap water
4. Reflecting customers' voice concerning measures for high quality water
3 Publicizing the overall quality of tap water

■ Publicizing safe and tasty water
  • Compiling and distribution of brochures
  • TV advertisements in trains
  • Holding relations activities
  • Distributing plastic bottles, “Tokyo Water”

■ Conducting the “Waterworks Caravan”
  • For fourth (about nine years old) to sixth graders
  • Visuals, short plays and experiments
  • Actual results: 2,379 schools (2006 ~ 2009)
  • Marks: 1,100 schools (per one year)
Four actions

1. Producing safer and better tasting water
2. Delivering high quality water to the tap
3. Publicizing the overall quality of tap water
4. Reflecting customers' voice concerning measures for high quality water
Reflecting customers` voice concerning measures for high quality water

- Utilization of the customers` voice
- Implementation and utilization of customer satisfaction surveys
References
Producing tap water satisfactory to all customers and ensuring that our culture of drinking tap water is passed on to the next generation.
THANK YOU