Introduction of PRTR Data Utilization in NITE

21st November 2018

PRTR Division
Chemical Management Center, NITE
### Published PRTR\(^1\) data for FY2016

#### Released amounts

- **398,000 t (100%)**

#### Amounts subject to PRTR notification

- **38%**

#### Estimated amounts not subject to PRTR notification

- **62%**

#### PRTR business categories subject to notification requirements

- Metal mining, manufacturing, electric utilities, and the like
- **151,000 t (38%)**

#### Amounts subject to PRTR business categories outside notification requirements

- **45,000 t (11%)**

#### Business categories that are not subject to PRTR notification

- Agriculture, construction, and the like
- **87,000 t (22%)**

#### Households

- Agricultural chemicals, paints, and the like
- **46,000 t (12%)**

#### Moving objects

- Vehicles, motorcycles, special motor vehicles, ships, trains, aircrafts
- **69,000 t (17%)**

#### Transferred amounts subject to PRTR notification

- **224,000 t**

---

\(^1\) PRTR: Pollutant Release and Transfer Register

---

2018 4th KCMA - NITE Periodical Meeting based on MOU, November 21-22
Utilization examples of PRTR data in NITE

NITE estimates the concentrations of chemical substances in the atmosphere from PRTR data.

1. Atmospheric concentration simulation over a wide area
   - PRTR map (concentration map) provided by NITE

2. Atmospheric concentration simulation in areas near factories
   - NITE and local governments collaborate to develop a simulation technique.

<table>
<thead>
<tr>
<th>Collaboration organization and period</th>
<th>FY2017–FY2018</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tokyo Metropolitan Government</td>
</tr>
<tr>
<td></td>
<td>FY2017–FY2018</td>
</tr>
<tr>
<td></td>
<td>Local Independent Administrative Agency</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hokkaido Research Organization</td>
</tr>
<tr>
<td></td>
<td>FY2018–FY2020</td>
</tr>
<tr>
<td></td>
<td>Kawasaki city</td>
</tr>
</tbody>
</table>
1. Atmospheric concentration simulation over a wide area

PRTR map provided by NITE
http://www.prtrmap.nite.go.jp/prtr/top.do (Japanese website)

NITE estimates the distribution of atmosphere concentrations of chemical substances with the atmosphere model AIST-ADMER*2 based on plume and puff models from “the amounts subject to PRTR notification” and “the estimated amounts not subject to PRTR notification”.

*2 National Institute of Advanced Industrial Science and Technology - Atmospheric Dispersion Model for Exposure and Risk Assessment

Concentration map

Input data of ADMER → emission data, weather data, physical properties

Estimated benzene concentrations in the atmosphere (FY2015)
Annual averages of the estimated atmospheric concentrations of benzene around NITE in FY2015

Environmental quality standard (EQS) for benzene in Japan

→The annual average concentrations in the atmospheric shall not exceed 3 µg/m³.
2. Atmospheric concentration simulation in areas near factories

- Subject in the environmental policy of local governments
  - Risk concern of chemicals relating to human health impacts via air in the vicinity of factories

Monitoring investigation: places, periods, and substances are limited.

To solve these problems:

Simulation techniques are essential to complement the monitoring investigation.

Collaboration between NITE and local governments

Development of a technique to estimate the atmospheric concentrations in areas surrounding factories
Collaborative investigation by NITE and local governments

Concentrations estimated from the emissions from factories
Calculation with the atmosphere model METI-LIS\(^3\) from “the amounts subject to PRTR notification”

Estimated background concentrations
Calculation with the atmosphere model ADMER\(^2\), from “the estimated amounts not subject to PRTR notification,” which are households, moving objects, etc.

Exposure assessment

Effective and reliable atmospheric concentration estimation

Hazard assessment

Risk assessment on the human health of chemical substances via air in areas surrounding factories

- Identification of chemical substances and regions where the likelihood of environmental risk exists
- Selection of priority chemical substances to be reduced

\(^*3\) Ministry of Economy, Trade and Industry–Low-rise Industrial Source dispersion model: an atmosphere model based on plume and puff models
Summary

➢ PRTR data utilization in NITE
  • PRTR map
  • Atmospheric concentration simulation near factories

◆ Combination of METI-LIS and ADMER
The combination can find the contribution from each emission source in the concentration for the designated site.

Example of atmospheric concentration distribution around a factory estimated with METI-LIS

Example of estimating the contribution from each source from the concentrations of the designated site

◆ Evaluation of estimation accuracy
Factor = \frac{\text{Estimated results}}{\text{Monitoring results}} \ldots \text{ *4}

If Factor is from 1/2 to 2, then the initial risk assessments can be used.

Thank you for your attention.