Citizen's Environment Alliance
Of Southwestern Ontario and Southeast Michigan

REVIEW OF THE NATIONAL POLLUTANT RELEASE INVENTORY (1995)

Prepared for the Toxic Tracker Programme of the Citizens Environment Alliance of Southwestern Ontario

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NATIONAL POLLUTANT RELEASE INVENTORY SUMMARY

The National Pollutant Release Inventory (NPRI) of 1995 reports on the release of 176 pollutants from point sources across Canada. The results reveal a 1% increase in the number of facilities reporting from 1994. On-site releases (tonnes) decreased by 6%, but off-site transfers increased by 20.6%, compared to 1994.

Locally, several facilities were included in the NPRI' s category of the largest polluters, of a given chemical, in the country. There were also a number of regionally and locally significant polluters in Windsor and Essex County.

Unfortunately, the NPRI has several significant limitations that undermine its value: the NPRI does not come close to providing a complete view of even one chemical within Canada's borders; the facility reports are based on estimates, not measurements; and the data is provided by the facilities themselves without independent verification. These limitations have the effect of eliminating public confidence in pollution prevention action and reducing pollution prevention iniatives to simple rhetorical and public relations exercises.

NATIONAL POLLUTANT RELEASE INVENTORY (NPRI) 1995

In order to be categorized in the NPRI facilities must have the equivalent (i.e. hours worked) of 10 or more full-time employees. The facility must manufacture, process or otherwise use NPRI listed pollutants in a concentration equal to or greater than 1% and in quantities equal to or greater than 10 tonnes. If these criteria are met then the facility **must** file a report with Environment Canada.

The NPRI includes on-site releases, off-site transfers, the "3Rs", and energy recovery. Reporting 3Rs and energy recovery was optional for the 1995 reporting year. The NPRI predicts on-site releases for the

next three years based exclusively on information provided by the facilities themselves, as well as anticipated 3Rs and off-site transfers.

Exemptions

There are many exemptions. Exempt facilities include those used exclusively for:

education and training (universities, colleges and schools);

research or testing;

maintenance and repair of transportation vehicles;

distribution, storage or retail sale of fuels;

wholesale or retail sale of articles or products which contain listed pollutants, but which are not released during normal use at the facility;

retail sale of listed pollutants;

growing, harvesting and management of renewable resources (forestry, fisheries and agriculture), but not those facilities which process or otherwise use their products;

mining, but not those facilities engaged in the further processing of mined materials;

the drilling or operating of oil and gas wells, but not those facilities which process or otherwise use their products

Changes in NPRI for 1995

The most significant change for 1995 was the change in reporting criteria. By-products were included in the calculation of the 10-tonne threshold, regardless of their concentration.

Furthermore, in the list of substances to be reported, two major changes occurred: the nitrate ion in solution at pH 6.5 or greater was required to be reported; and total ammonia was added, replacing ammonia, ammonium sulphate and ammonium nitrate. Other minor changes involved adding the qualifier "friable" to asbestos, adding "and its salts" to weak acids and bases and deleting one category of zinc since it was included in another category.

Changes to the directives for 1995 included:

All releases to sanitary sewers are reported as a transfer to a sewage treatment plant regardless of the level of treatment at the plant. In 1993 and 1994, releases to sanitary sewers that fed a treatment plant with only primary treatment were considered a release to water;

Rounding of releases less than 0.5 tonnes to zero was permitted in 1993 and 1994, but is no longer allowed. Codes are used to reflect the amount released, with reporting of zero allowed only if releases are zero;[1]

Facilities that transfer NPRI substances from one container into another type are required to report in 1995 if releases occur during the transfer or repackaging of materials;

The 1995 NPRI reporting software also made changes to minimize common errors such as incorrect reporting of geographical location and SIC code.[2]

176 NPRI pollutants were listed for 1995, two fewer than in 1994. The 176 pollutants included 10 CEPA designated toxicants, 6 International Agency for Research on Cancer (IARC) and 9 as IARC likely carcinogenic. Many pollutants appear on two lists.

Results

The number of facilities reporting to the NPRI represented a 1% increase over 1994, although there was a decrease in Ontario by 2%. The reports of on-site releases and off-site transfers increased from 1994.

On-site releases (tonnes) dropped 6%, but off-site transfers of waste increased by 20.6%. Ontario had the highest on-site releases, representing 36% of the national total, followed by Alberta.

There are 23 NPRI pollutants that are categorized as toxic and/or carcinogenic. On-site releases of NPRI listed toxic and carcinogenic pollutants decreased between 1994 and 1995, with the exception of asbestos, nickel, epichlorohydrin and formaldehyde. However, there were also four fewer toxic and/or carcinogenic pollutants categorized in 1995 than in 1994. The actual reduction between 1994 and 1995 is **less than** that originally projected in 1994.

Off-site transfers are divided into treatment (physical, chemical, biological, incineration and municipal sewage treatment plants) and disposal (land, storage, underground injection and land application). Most of the 1995 off-site transfers (52%) went to land, i.e. landfills, similar to 1994, followed by incineration and chemical treatment. The highest quantity of off-site transfers was for zinc and its compounds. The number of toxic and carcinogenic compounds reported as off-site transfers were 16.

Overall releases are lower in 1995 than in 1994. The change in the method of reporting the threshold resulted in large increases in reporting between 1994 and 1995, representing an increase in the reporting of on-site releases.

The NPRI claims that new reports mask some of the decreases that have been achieved. The NPRI states that new reports are due in "large part"[3] to the change in reporting criteria and "are not true increases in releases, but only increases in reported releases."[4] The NPRI does admit that it is not possible to determine exactly the increase due to new reporting.[5]

Supplementary Information

The NPRI attempts to contextualize its data by comparing other sectors, including non-point sources, that are not required to report to the NPRI. The 1995 report provides supplementary information on the total release of 22 NPRI pollutants[6] from sources such as fuel distribution, motor vehicles and mobile equipment. The total release of the NPRI pollutants from the above mentioned sources were estimated to exceed by seven times the total of the same 22 that were part of the 1995 NPRI report.

A large number of small facilities are not required to report to the NPRI. Taken collectively, as an industrial sector, the small facilities releases are significant; for example, dry cleaners and solvent

degreasers.

The 1995 report also provides information from other inventories on significant releases, in Canada, of pollutants that do not currently appear on the NPRI list. Data from 1995 shows that carbon dioxide accounted for 81% of greenhouse gases. The transportation sector accounted for 27% of total greenhouse gas emissions, industrial processes and combustion 18%, power generation 15% and production and distribution of fossil combustion 15%. The emission of greenhouse gases (carbon dioxide [CO2], methane [CH4], nitrous oxide [N2O], perfluorocarbons [CF4] [C2F6] and sulphur hexafluoride [SF6]) were approximately 5,000 times greater than the total on-site releases of NPRI pollutants to the air in 1995.

Largest NPRI On-Site Releases (Windsor, 1995)

Ford Windsor Aluminum Plant: aluminum, 3.539 tonnes (air)

BASF: i-butyl alcohol, 2.9 tonnes (air)

Chrysler Windsor Assembly Plant: methyl isobutyl ketone, 22.3 tonnes (air)

Ford Essex Aluminum Plant: styrene, 53 tonnes (air)

Chrysler Windsor Assembly Plant: xylene, 292 tonnes (air)

Chrysler Pillette Truck Assembly Plant: xylene, 177 tonnes (air)

The facilities above were cited in the NPRI amongst the largest polluters, of a given chemical, in the country.

Chrysler Pillette Truck Assembly Plant: acetone, 45.509 tonnes (air)

General Chemical: ammonia, 1,942 tonnes (1,757.6 air; 184.4 water)

West Windsor Pollution Control Plant: ammonia, 480.9 tonnes (25.4 air; 455.5 water)

Chrysler Pillette Truck Assembly Plant: *n*-butyl alcohol, 16.5 tonnes (air)

Ford Windsor Casting Plant: formaldehyde, 1.8 tonnes (air)

Chrysler Windsor Assembly Plant: isopropyl alcohol, 36 tonnes (air)

Ford Windsor Casting Plant: lead, 2.79 tonnes (.19 air; 2.6 water)

Ford Windsor Casting Plant: manganese (and its compounds), 6.25 tonnes (.35 air; 5.9 water)

Chrysler Windsor Assembly Plant: methanol, 33.61 tonnes (air)

BASF: methyl ethyl ketone, 44 tonnes (air)

Chrysler Windsor Assembly Plant: methyl ethyl ketone, 70.88 tonnes (air)

Ford Windsor Aluminum Plant: 1,2,4-trimethylbenzene, 5.082 tonnes (air)

Chrysler Windsor Assembly Plant: toluene, 39.961 tonnes (air)

Ford Windsor Casting Plant: zinc (and its compounds), 57.1 tonnes (1.1 air; 56 water)

The list above, when combined with the preceding list, presents twenty NPRI pollutant releases of significant importance (nationally, regionally, locally).

Locally, 32 facilities submitted forms to the NPRI for the 1995 reporting year. For this report, the calculation of pollutant releases from local facilities is based on the following criteria: reported totals for releases and transfers and/or; facilities with releases and transfer totals that were significant enough to be categorized. Some facilities were included in calculations of **total** releases and transfers for this report, but may not contribute to the sum of those totals because their releases and transfers were not categorized within the NPRI data sheets.

The following facilities submitted reports to the NPRI; those in parentheses did not meet the criteria for further assessment in this report: A.G. Simpson, (Anchor Lamina)[7], BASF, (Centerline), (Chemfil Canada), Chrysler Pillette Truck Assembly Plant, Chrysler Windsor Assembly Plant, CXY Chemicals, (DNN Galvanizing), Fabricated Steel Products, Ford Essex Aluminum Plant, Ford Essex Engine Plant, Ford Windsor Aluminum Plant, Ford Windsor Casting Plant, Ford Windsor Engine Plant, Ford Windsor Engine Plant #1, General Chemical, (General Motors Transmission Plant), Integram Windsor Seating, Lynx Environmental Services, Macdonald and White Varnish and Paint, Reliance Steel Fabricators, Riverside Fabricating, Standard Induction Castings, Tooling Technology Centre[8], Universal Fasteners, West Windsor Pollution Control Plant, Windsor Little River Pollution Control Plant, Zalev Brothers.

Transfers exceeded releases in 17 of 33 locally reported substances.[9] Transfers also exceeded releases in 4 of 5 locally reported NPRI toxic and/or carcinogenic substances.[10]

Total local releases equalled 3,479.492 tonnes. Air releases were the largest portion of total releases at 2,757.843 tonnes, followed by water releases at 720.467 tonnes.

Total local transfers equalled 1,791.458 tonnes. Transfers to landfills were the largest portion of total transfers at 1,350.5076 tonnes, followed by transfers to incineration at 379.047 tonnes.

Comparison and Critique of Pollutant Release and Transfer Registers (PRTR)

The United States' Toxic Release Inventory (TRI) for 1995 consists of 606 chemicals, including 28 categories, compared to 176 chemicals, including 16 categories, on the NPRI list. A total of 169 substances, including 16 categories, are common to the NPRI and TRI. The NPRI is part of a relatively languorous toxic designation process in Canada. The toxic substance assessment process includes absurd bureaucratic delays and deferrals in implementing remediation activities and pollution prevention programmes.

Another major difference between the NPRI and TRI databases is the reporting thresholds. In the United States if more than 11.34 tonnes of a chemical is manufactured or processed or if more than 4.54 tonnes is "otherwise used," then releases and transfers must be reported. In Canada, if 10 tonnes or more of the substance is manufactured, processed or "otherwise used," then releases and transfers must be reported.

Both countries require reporting if the amount of chemical in a mixture equals or exceeds 1 percent by weight. However, the United States has an additional lower threshold for carcinogenic chemicals: chemicals identified as carcinogens by the Occupational Safety and Health Administration (OSHA) standard must be reported at levels of 0.1 percent. The combined differences in the threshold, noted here, generally results in United States facilities meeting the threshold at lower levels of chemical activity and use than Canadian facilities.[11]

Reductions in releases reported to the PRTRs do not necessarily represent smaller quantities of chemical substances released to the environment. Generally, facilities estimate rather than measure their releases.[12] In order to reduce the cost of preparing PRTR reports, precise measurement is not required. A facility may choose one of several methods for estimating its releases, based on monitoring data, materials balance calculations, or best engineering judgement. Changing from one estimation method to another may cause variation in the amounts reported **without** any change in actual releases.

The estimation methods for a particular industry may be supplied by a trade association or by manufacturers of equipment widely used in that industry. When emission factors are revised the result is that reported releases for an entire industry may change.

The **crucial weakness** of the NPRI, and other PRTRs, is that it **does not** come close to providing a complete view[13] of even one listed chemical within the country's borders. For border communities such as Windsor, the failure of State regulation (i.e., agencies of the State such as Environment Canada, Environmental Protection Agency, etc.) to take into account the limitations and differences of PRTRs, and to ameliorate those differences, results in unequal importance being placed on pollution prevention.

Comments and Recommendations

The following is a summary of some of the comments and concerns compiled from submissions made by environmental non-governmental organizations as part of a previous review process of the NPRI:

the NPRI requires a regulatory framework that will **provide accountability**, **as opposed to voluntary initiatives**;

the use of toxins is not covered;

the reporting of NPRI list materials in products transferred off-site is still not covered. Reporting such transfers should be mandatory;

the substances on the NPRI list should be expanded to include:

any substances, such as dioxins and furans, meeting the toxicity requirements with respect to persistence and bioaccumulation under CEPA; atmospheric pollutants SOx, NOx, VOCs, alkyl-lead and greenhouse gases; pesticides (the use and release of industrial/commercial and residential pesticides); metal and coal mining; fuel distribution and storage; chemical wholesalers; both individual substances and compounds;

the process for selection to the NPRI should be simplified;

the annual reporting deadline should be adjusted to May 1;

the thresholds for reporting should be reviewed: the number of employees should not be limited to 10 or

more (which excludes smaller firms); the exemption from reporting should be based on the absence of environmental significance rather than size; the threshold for reporting (10 tonnes) should be adjusted downward and reflect the toxicity of the substance;

the NPRI must track the pollution prevention activities of facilities. NPRI data provides the base for comparison to track source reduction, production level modifications, pollution control, etc. The federal government should examine mechanisms to measure progress in this regard, provide enforcement for pollution prevention and incentives for innovation;

require a monitoring and testing mechanism to measure the accuracy of reporting;

report on-site waste treatment, sewer discharge and incineration activities;

ensure ease of access to information by the public, in general, and workers, particularly in the facilities listed on the NPRI;

more attention should be paid to the potential for catastrophic accidents: identify and establish appropriate thresholds of those substances with the potential to cause catastrophes, for example, through accidental releases and mechanical failure; facilities that meet or exceed these thresholds should report the maximum amount of the chemical store on the site on any day and the average amount stored daily; this information should be distributed to fire departments, public health officials and made available to the general public;

and the NPRI should expand, toward the direction of the United States TRI.

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1. Total releases less than 1 tonne report total releases only. Releases to each medium less than 1 tonne report by range code.

2. Commission on Environmental Cooperation, Taking Stock: North American Pollutant Releases and Transfers 1995 (Draft) October 1997, p.7.

3. Environment Canada, National Pollutant Release Inventory: Summary Report 1995, p.49.

4. Ibid..

5. Ibid..

6. The 22 NPRI substances compared with fuel distribution and mobile sources include: acetaldehyde; acetone; benzene; 1,3-butadiene; butyraldehyde; cyclohexane; ethylbenzene; ethylene; formaldehyde; lead; manganese; naphthalene; phenol; propionaldehyde; propylene; styrene; toluene; 1,2,4-trimethylbenzene; xylenes (mixed isomers); m-xylene; o-xylene; p-xylene.

7. The two facilities of Anchor Lamina submitted dubious reports. Identical numbers were reported for Releases, Transfers and 3Rs.

8. Three facilities; two in Windsor and one in Oldcastle.

9. The 33 locally reported substances included: methanol; xylene; toluene; ethylbenzene; zinc; nickel;

manganese; chromium; isopropyl alcohol; n-butyl alcohol; I-butyl alcohol; methyl ethyl ketone; 1,2,4-trimethylbenzene; ethylene glycol; acetone; hydrochloric acid; copper (and its compounds); butyl benzyl phthalate; methyl isobutyl ketone; phosphoric acid; sulphuric acid; lead (and its compounds); nitrate ion in solution at pH>=6.5; chlorine; ammonia (total); styrene; methylenebis (phenylisocyanate); aluminum (fume or dust); cadmium (and its compounds); naphthalene; cobalt (and its compounds); phenol (and its salts); formaldehyde.

10. NPRI toxic and carcinogenic substances reported locally were nickel, chromium, lead, cadmium, and formaldehyde.

11. Taking Stock, p.9.

12. Ibid., p.13.

13. Knowledge and data on the creation, production, use, and impacts of the tens of thousands of chemicals in existence in North America remains woefully inadequate.