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## Toxic Chemicals

# and Indigenous Communities

**Two case studies explore how the CEC's North American Pollutant Release and Transfer Register (PRTR) Project can better serve indigenous and tribal communities**

**September 2007**

### Overview

The Commission for Environmental Cooperation's (CEC) North American Pollutant Release and Transfer Register (PRTR) Project tracks and publishes information on the amounts, sources and handling of toxic chemicals generated by industrial facilities in North America. The CEC's *Taking Stock* report and database provide a matched dataset of industries and their emissions of chemicals being reported to the National Pollutant Release Inventory (NPRI) in Canada, the Toxics Release Inventory (TRI) in the United States and, as of 2007, the *Registro de Emisiones y Transferencia de Contaminantes* (RETC) in Mexico.

A key goal of the CEC's PRTR Project is to provide information for decision-makers at all levels of society. In order to assess North American tribal and indigenous communities' awareness and/or use of PRTR information, the CEC commissioned two case studies: one in the Baja California region on the US-Mexico border, and the other in the Great Lakes region on the Canada-US border.

The objectives of the studies included:

- Obtaining information from the communities about their health and environmental concerns, particularly relating to toxic substances;
- Discovering if the communities are aware of and/or make use of PRTR data; and
- Identifying effective strategies for communicating PRTR information to tribal and indigenous communities and for involving them in CEC programs.

While these studies were conducted in a fairly informal fashion and are not statistically conclusive, the results do reflect the kinds of comments the CEC has received from indigenous and tribal representatives relative to PRTR information. The case studies reveal similarities in terms of communities' environmental concerns and their awareness or use of PRTR information:


- Overall, indigenous and tribal communities are not aware of PRTR databases; of those that are, very few individuals know how to make use of the data.
- The communities are concerned about the potential health, environmental and cultural impacts of toxic substances and expressed the need for PRTR-related outreach activities and materials tailored to their specific needs.
- A key challenge facing these communities is the lack of resources or expertise to fully research the potential impacts of industrial emissions.

At the annual PRTR Consultative Group meeting, held in San Diego in November 2006, the CEC organized a special, one-day session for representatives of indigenous and tribal communities to discuss their concerns relating to toxic chemicals. The session generated a great deal of interest and the CEC has received feedback from participants wishing to continue collaborating on this topic.

These case studies were produced for the Secretariat of the Commission for Environmental Cooperation. The information contained herein is the responsibility of the authors and does not necessarily reflect the views of the CEC, or the governments of Canada, Mexico or the United States of America.

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The CEC wishes to thank Ron Plain, Paula Stigler and Hiram Sarabia, who worked closely with these communities to develop the case studies.

**Ron Plain** is from the Aamjiwnaang First Nation located in Sarnia, Ontario, in the Canada-US Great Lakes region. He is founding member of the Aamjiwnaang Environment Committee and has been very active in raising awareness about the unique environmental problems facing his community.

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## The Two Study Areas

The border regions of North America were chosen as the focus of these studies because they seemed appropriate for assessing the awareness and/or use of at least one of the North American PRTR databases available at the time (i.e., Canada's National Pollutant Release Inventory—NPRI; the US Toxics Release Inventory—TRI; or the CEC's *Taking Stock Online* database of matched North American facilities).

**The Baja California Case Study** examines the experience of the **Rincon Band of Luiseño Indians**, located in San Diego County, California, on the border with Mexico. The US-Mexico border zone is a dynamic region defined as the land area 100 kilometers on either side of the border. The international border in the middle of this 200 kilometer zone has separated many indigenous communities whose historical territories once included lands in both the US and Mexico. Today, the indigenous population of the US–Mexico border numbers approximately 40,000, including residents of nearly 60 US and Mexican tribal nations and indigenous communities. These nations and communities cover almost three million acres of land within this zone.<sup>1</sup>

Located within the territory of the Rincon Reservation is a boat-building and repair plant, and the community has expressed some concern about emissions from this facility.

**The Great Lakes Case Study** focuses on the experience of two First Nations communities in Ontario, Canada, on the border with the US state of Michigan. This Great Lakes border region is a rich economic zone featuring natural resources (lakes, agricultural land) as well as some areas with high concentrations of industry.

**Aamjiwnaang First Nation**, located near Sarnia, Ontario, came to the attention of the public when Ontario health professionals observed a marked decrease in male births over female births.

Like Aamjiwnaang, **Ketegaunseebee (Garden River) First Nation** is very close to a city (Sault Ste-Marie, Ontario), and proximate to industrial facilities, including steel, forestry, pulp and paper, and petrochemical plants.

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<sup>1</sup> Wilken-Robertson, *The U.S.-Mexican Border Environment: Tribal Environmental Issues of the Border Region*, (SCERP Monograph Series, no. 9, 2004), 15.

## Baja California Case Study: PRTR Data and the Rincon Band of Luiseño Indians

The Rincon Band's Reservation is located in northeast San Diego County in Southern California and comprises approximately 4,000 acres of land. The majority of the people living on the Reservation are Luiseño Indians, with 651 registered tribal members and a community population of approximately 1,495 persons.

The facility of concern to the population is Survival Systems International Inc. (SSI), located in the center of the tribal community near homes, apartments, tribal businesses and a daycare. SSI is a privately-owned, non-tribal company on tribal fee land<sup>2</sup> and has reported releases of both acetone and styrene since 1998. Since the company is within the Reservation boundary, the tribe should be able to regulate and inspect the business if it has the capacity to do so and if an agreement is made between the tribal government and the facility. However, the objective of this study is to explore if the Luiseño Indians are aware of or use PRTR data, and how

knowledge of PRTR and emissions information may prepare them to explore and address their concerns about emissions within or near their reservation.

### Study Methodology

Of the 26 federally-registered tribes along the US side of the border, 24 have environmental programs funded by the US EPA and/or tribal funds.<sup>3</sup> A simple survey was sent out electronically to all of these tribal environmental programs.

The following is a sample of the questions that were asked in the survey:

- Are there any facilities releasing toxics/pollutants (including air emissions, wastewater discharges, solid waste or that operate landfills or underground storage tanks) in or around your tribal lands?
- Do you know what a PRTR database is?
- If yes, have you ever used a PRTR database before?

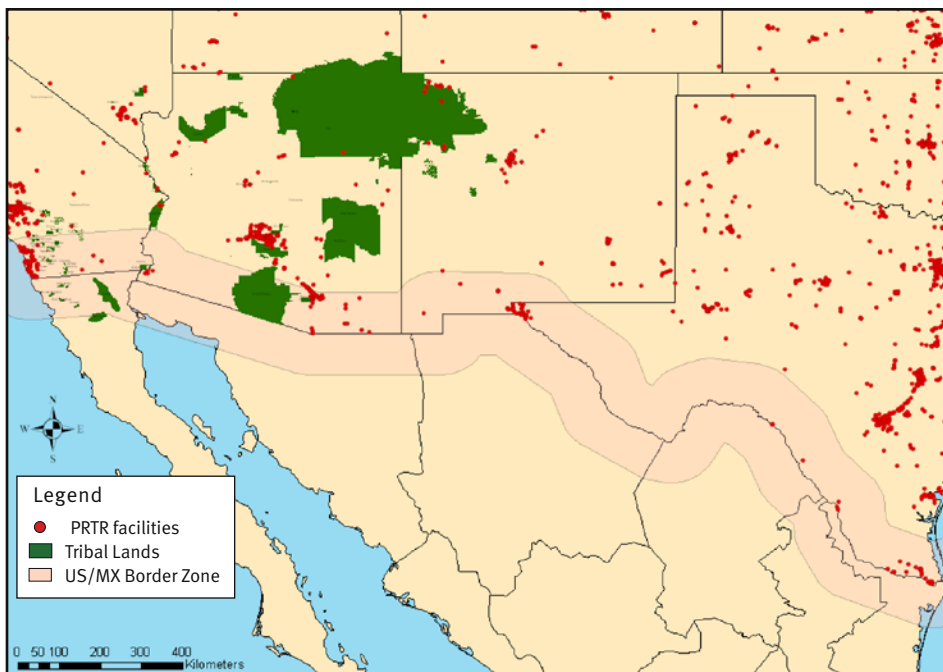
- Would you be interested in participating in the development of a model (case study) to improve the accessibility and utility of PRTR databases for tribes?

Initially, only one environment department responded to the survey, indicating it was unsure of any nearby facilities and had never heard of PRTR databases, but would be interested in receiving more information.

Maps were then created showing the US tribes in the border region and TRI-listed facilities.<sup>4</sup> Also, the National Atlas online mapping tool was used to identify tribal lands in the United States with TRI-registered facilities and to obtain specific information on these facilities and evaluate the efficacy of online mapping resources for use by tribal communities. After the maps were created, data searches were completed using the *Taking Stock* and TRI databases for those facilities located within approximately 10 miles of tribal lands in California, Arizona, Texas and Baja California. This research identified the Rincon Band in San Diego County as a possible participant for the study, since the Rincon Reservation has a TRI-listed facility located on its land.

The Rincon environment department was contacted by phone and stated it had not used PRTR databases before, but would

### US Tribal lands and PRTR reporting facilities



Created on 10/27/06 by Paula Stigler. Data source: PRTR

2 Fee land is any land that is not held in trust by the United States of America and is owned by individuals who may or may not be members of the tribe. The owner pays state and local government taxes but still may fall under tribal jurisdiction.

3 Because data from Mexico's PRTR (the *Registro de Emisiones y Transferencia de Contaminantes*—RETC) were not available until the later stages of this study, it was not possible to develop a case study for an indigenous community from Mexico, and only one from the United States was chosen.

4 As the Mexican RETC database became available, the coordinates for facilities in Baja California were mapped along side the US tribal lands and the Baja California indigenous communities (these coordinates had to be converted in order to display them and while some were found to be inaccurate, the exercise was valuable for showing the potential of mapping tools).

be interested in using this tool to find out what types and levels of toxicants were being released from the facility located in the center of the community. Data searches had revealed that styrene and acetone were the chemicals being released; therefore, information on potential short- and long-term health effects associated with exposures to these contaminants was gathered via the Internet, (e.g., ATSDR and US EPA online toxics databases).

### Community Concerns

The Rincon tribe believes that there is a lack of inspections of the Survival Systems facility and is concerned with the jurisdictional issues regarding who is in charge of overseeing these inspections. Some community members have made a few complaints of a smell emanating from the facility. These concerns were brought to the attention of the Rincon environment department.

The following information about styrene (one of the main substances being released by this facility and reported to the US TRI), was obtained through the Internet resources mentioned above.

Styrene is a synthetic chemical also known as vinyl benzene, ethenylbenzene, cinna-mene or phenylethylene. It dissolves easily in some liquids, but not in water. Billions of pounds of styrene are produced each year to make products such as rubber, plastics, insulation, fiberglass, pipes, boats, automobile parts and carpet backing.<sup>5</sup> Styrene is classified as a possible human carcinogen by the US EPA and can be detected by the human nose at very low levels; however, regular exposure reduces the ability to smell the chemical.<sup>6</sup> Some of the potential short-term health effects of exposure include:

- Irritation of the nose, throat and eyes
- Gastrointestinal effects
- Symptoms such as headache, dizziness and fatigue
- Slower reaction times, reduced manual dexterity, and impaired co-ordination and balance.

### California Tribes and PRTR reporting facilities



Created on 10/27/06 by Paula Stigler Data source: PRTR

Potential long-term health effects include:

- Increased damage to the genetic material in one type of blood cell (lymphocytes)
- Effects on the central nervous system (CNS), such as headache, fatigue, weakness, and depression, CNS dysfunction, hearing loss, and peripheral neuropathy.<sup>7</sup>

### Study Results

This survey showed that there is a general lack of knowledge within US border tribal communities regarding PRTRs. While the Rincon tribe was concerned about the possible effects of environmental pollutants being released by the local facility, the community was not aware of existing PRTR databases. When several of the tribal environment departments were eventually contacted following this study, a number of them stated that they were aware of the US Toxics Release Inventory (TRI), but that they found the database difficult to manipulate and not very useful.

During the CEC's annual PRTR Consultative Group meeting held in San Diego in Novem-

ber, all of the indigenous participants were receptive and interested in obtaining more information after receiving basic information about some of their own communities.<sup>8</sup> The Mexican indigenous representatives were unaware of any Mexican or US PRTR databases and were unacquainted with any of the facilities near their communities that might be of concern.

### How PRTR Data Could Benefit the Rincon Band of Luiseño Indians

This study demonstrates the usefulness of PRTR databases in identifying industrial emissions of chemicals and their potential to empower indigenous communities to make informed decisions and engage in informed dialogue with regulatory entities and industry.


It is imperative that tribal communities be well informed regarding activities that are

5 See <<http://www.atsdr.cdc.gov/tfacts53.html>>.

6 More information can be found at <[www.epa.gov/iris](http://www.epa.gov/iris)>.

7 See <[www.atsdr.cdc.gov/tfacts53.html](http://www.atsdr.cdc.gov/tfacts53.html)>.

8 Meeting of the CEC's North American Pollutant Release and Transfer Register (PRTR) Consultative Group, San Diego, November 2006 (see: <[www.cec.org](http://www.cec.org)>).



occurring on or near their lands in order to protect their health and environment. It is foreseen that the information provided by PRTRs can help tribes/communities to:

- Learn of contaminant sources and identify potential environmental and health issues;
- Improve enforcement and regulation;
- Present information to tribal leaders;
- Conduct outreach to community members and relay important information to protect public health;
- Enter into dialogue with industry and government agencies to address environmental health concerns and issues;
- Develop emergency and disaster planning;
- Manage natural resources; and
- Plan for community growth (placement of industry, housing, infrastructure, schools, etc.).

Historically, tribal communities have had limited capacity and resources to address potential environmental health issues arising from the presence of pollutants on or near their lands. However, in recent years, tribes in the United States and some Mexican indigenous communities have begun to develop environmental programs and build their capacity to understand and monitor potential environmental health hazards.

On the US side of the border, there are 26 federally recognized tribes and of those, 24 have environmental programs funded by the US EPA and/or tribal funds. However, tribal environmental programs often do not have an environmental health component within their departments. In the United States, Indian Health Services (IHS) provides tribes with environmental health information, but there is little interaction between the tribal environmental departments and the IHS.

Almost all the tribal members and representatives who were given hands-on demonstrations of the *Taking Stock*, RETC and TRI web sites during the CEC's Consultative Group meeting in San Diego found them to be potentially useful tools for informing communities of chemicals being released and transferred from nearby facilities. It seemed the mapping of the facilities through the National Atlas site and Arc View (RETC) had the most impact. It is recommended that visual displays, such as maps and charts, be provided in order to improve imparting this important information to tribal communities. It is important to provide assistance on how to visually display the data and/or provide more information on mapping tools.

As many indigenous communities in Mexico do not have Internet access or even mail service, it is critical to develop alternative educational and outreach methods in order to familiarize them with the data. As of December 2006, Mexico released an online database of toxic releases called the *Registro de Emisiones y Transferencia de Contaminantes* (RETC). The CEC's annual *Taking Stock* report and database will draw upon these data in 2007 and thus tribes on both sides of the border can have access to them.

It is anticipated that PRTR databases can become an important resource for tribes and environmental health research along the US-Mexico border region with the collaboration of tribal nations and communities, and with further development of the Mexican PRTR system.

Recommendations to improve indigenous community access to PRTR data:

- Provide appropriate workshops, training and educational materials for the communities, as well as organizations (e.g., non-profit organizations, health agencies, etc.) working within these communities.
- Demonstrate the usefulness of the new RETC database for border communities.



## Great Lakes Case Study, Community #1: PRTR Data and the Ketegaunseebee First Nation

Ketegaunseebee First Nation, (Garden River Indian Reserve No. 14), is located on the Trans-Canada highway, eight miles east of Sault Ste-Marie, Ontario, Canada and 10 miles from the border with Sault Ste Marie, Michigan, United States. Ketegaunseebee has an on-reserve population of 1015, with 1076 members living off-reserve.

Within Ketegaunseebee territory, there are nine facilities registered with Canada's National Pollutant Release Inventory (NPRI). The industries located upwind and upriver of Ketegaunseebee, include forestry, pulp and paper, petrochemical, steel and municipal water treatment facilities.

### Study Methodology

The methodology involved discussions, for the most part with community residents. These discussions were purposely informal, as it was felt that "interview"-style information-gathering would have constrained participant responses.

Separate discussions were held with Ketegaunseebee residents, including:

- A group discussion with fifteen Ketegaunseebee residents in a formal setting;
- Discussions during a Chief and Council meeting;
- Information exchanges with residents in informal groups; and
- Individual conversations.

### Community Concerns

Discussions held with community residents revealed that they did not know whether they should be concerned about specific chemicals; however, heavy metals were identified by one community member, the environ-

mental officer for the Chiefs of Ontario (an organization of First Nations communities). She stated that she had some knowledge of Canada's NPRI (although she did not really know how to use the information) and expressed some concern about the possibility of local industrial emissions of heavy metals.

There was general agreement among residents that the upstream and upwind industries posed a potential health threat. In addition to industrial releases, the pollution sources identified as being of immediate concern included truck and other vehicle exhaust, as well as road salt.

The cultural and human health impacts of environmental contaminants identified by Ketegaunseebee residents include the following:

- Hunting: game and fowl contamination by industrial releases and road salt;
- Medicines (sweet grass, cedar, sage, etc.): contamination by industrial releases and road salt; and
- Fishing: fish contaminated by chemicals.

### Study Results

The community of Ketegaunseebee has very little knowledge of Canada's NPRI database, or other PRTR database (prior to this study, almost all community members had never heard of such databases). Moreover, study participants who were shown examples of the data found the information to be interesting, but could not think of how to best use the data.

Following the study, the community has begun to discuss how to gain a better understanding of the potential harm that could be caused by exposure to emissions.

### How PRTR Data Could Benefit the Ketegaunseebee First Nation

PRTR data would be one source of information to help educate residents of Ketegaunseebee about what is being released by industries in the vicinity of their community. The data could benefit the community in many ways, such as providing direction for:

- Studies of the potential effects of industrial emissions on human health;
- Determining the need for precise testing of soil, sediment and water, perhaps leading to the design of water and air modeling studies of industrial releases.

PRTR data would also provide a basis for dialogue between the community and industry and government, in relation to health concerns of the community. This can give the citizens of Ketegaunseebee a sense of empowerment and environmental awareness.

An identified concern is how to understand and make use of PRTR data (e.g., "X" amount of a particular compound, released into the air over a calendar year, translates into how much risk?). In order for PRTR data to be useful to Ketegaunseebee:

- PRTR-related educational materials that are meaningful to residents should be developed and made available.
- Relevant agencies should provide support for further studies, in the form of financial resources as well as training of community members.

## Great Lakes Case Study, Community #2: PRTR Data and the Aamjiwnaang First Nation

Aamjiwnaang First Nation, (Sarnia Indian Reserve No. 45) is located within the city limits of Sarnia, Ontario, three miles from the border with Port Huron, Michigan, United States. Aamjiwnaang has an on-reserve population of 850, with 1100 members living off-reserve.

There are 52 companies registered with either Canada's National Pollutant Release Inventory (NPRI), or the US Toxics Release Inventory (TRI), within 10 miles of Aamjiwnaang territory. The industries (petrochemical, petroleum, rubber and polymer plants) comprise Canada's largest concentration of chemical plants.

### Study Methodology

The methodology involved discussions, for the most part with community residents. Overall, these discussions were purposely informal, as it was felt that "interview"-style information-gathering would have constrained participant responses.

Separate discussions with participating community members included:

- Meeting with 50 Aamjiwnaang residents in a formal setting;
- Discussions held during Chief and Council meetings;
- Exchanges during environment committee meetings;
- Community information meetings;
- Informal discussions with groups of residents; and
- Individual conversations.

### Community Concerns

Aamjiwnaang First Nation came to the atten-



A close-up view using the CEC's mapping tool for Google Earth shows the Aamjiwnaang First Nation reserve's proximity to industrial facilities reporting PRTR information.

tion of the public when officials from the Occupational Health Clinics for Ontario Workers noticed a marked decrease within the community in the number of male births compared to female births. Scientists are exploring the possibility that this abnormality may be caused by the heavy concentration of industry surrounding the community. Therefore, Aamjiwnaang has been the subject of research, particularly relating to the possible source of endocrine-disrupting chemicals affecting the sex ratio. The skewed sex ratio was assessed over the period 1984–2003, as part of a community-based, participatory research project. The project is described here:

*Numerous factors have been associated with a decrease in the proportion of male births in a population, including a number of envi-*

*ronmental and occupational chemical exposures...Although there are several potential factors that could be contributing to the observed decrease in sex ratio of the Aamjiwnaang First Nation, the close proximity of this community to a large aggregation of industries and potential exposures to compounds that may influence sex ratios warrants further assessment into the types of chemical exposures for this population. A community health survey is currently under way to gather more information about the health of the Aamjiwnaang community and to provide additional information about the factors that could be contributing to the observed decrease in the proportion of male births in recent years.*

REF: *Environ Health Perspect* 113:1295–1298 (2005). doi:10.1289/ehp.8479, available via <<http://dx.doi.org/>> [Online: 17 August 2005]

In terms of health concerns, there was general agreement in the community that local industry emissions were a health threat. Residents mentioned their concerns about endocrine-disruptors, as well as other chemicals, such as heavy metals (e.g., mercury and lead). Body Mapping<sup>9</sup> was conducted to examine the possible health impacts of exposures to emissions. The results revealed the following:

<sup>9</sup> Body Mapping is the reported data of community members who participated in health questionnaires. The self-reported health information is translated into a variety of color-coded stickers and placed strategically on drawings of human bodies (Adult Male, Adult Female, Child Male, Child Female). The resulting information is a visually accurate picture of the health status and concerns of the community. This information, properly catalogued and documented, will provide the basis for cause-effect investigations of the residents' illnesses and concerns.

- Reproductive disorders,
- Learning and behavioral problems,
- Skin disorders,
- Respiratory problems,
- High blood pressure,
- Headaches,
- Thyroid problems,
- Kidney problems, and
- Cancers.

The cultural impacts of industrial pollution identified by community members during discussions included the contamination of game, fowl, fish, and medicines (sweet grass, cedar, sage, etc.). In addition, members of Aamjiwnaang expressed concerns regarding exposure to pollution through participation in outdoor ceremonial activities.

### Study Results

The situation relating to chemical awareness in the Aamjiwnaang community is vastly different from that of Ketegaunseebee First Nation, as a result of the highly-publicized birth-ratio phenomenon. Canada's NPRI was not unfamiliar to the Aamjiwnaang Environment Committee, community leaders and health professionals. Some citizens could also recall having seen PRTR data during presentations given at public meetings in the past (although none were using the data).

To a certain degree, PRTR data are already benefiting the community, through ongoing research conducted by external agencies into the possible causes of the birth ratio skewing. The community is also participating in efforts to examine legal avenues to pressure the government to consider cumulative effects of emissions when issuing Certificates of Approval.

### How PRTR Data Could Benefit the Aamjiwnaang First Nation

In terms of the usefulness of PRTR data, community members who were shown the data during the course of this study could not think of ways to use the information. The consensus was that designated health professionals would best know how to use that information. Therefore, to address the residents' lack of knowledge about PRTR information, it is recommended that:

- Educational material be developed to help health staff better acquaint themselves with PRTR data. Regional workshops geared to community leaders and health professionals would help in this regard.
- The information needs to be rendered meaningful to residents (e.g., "X" amount of a particular compound, released into the air over a calendar year, translates how?)

Cultural impacts of the pollution were of great concern. Practicing many cultural activities has been affected or impeded because of the potential harm. It would be important to incorporate traditional aboriginal knowledge into any future plan to address the potential impacts of emissions.

The ranking of facilities in the PRTR databases was something participants liked about the data. The thought was it could be used as a motivation for industries to improve their environmental performance. In order to promote this, a newsletter could be sent out to local communities, identifying facility rankings.

Participants agreed that the Canadian NPRI web site can be difficult to navigate. The target audience needs a user-friendly medium. The <pollutionwatch.org> site is a good example of a user-friendly site. Participants suggested that Environment Canada reassess the NPRI site format for general ease of use and the ability of the data to be understood by the target audience.

A key challenge facing these communities is the lack of resources and expertise for conducting studies to assess the potential impacts of industrial emissions. Financial and technical support from outside agencies would be required to address these needs.

## Concluding Remarks

While a small number of individuals participating in the study showed some awareness of PRTR databases, in general, there is a real lack of knowledge about how to use such information. Community members expressed the need for assistance in using and interpreting the data in ways that are meaningful (for instance, more visual information, including the use of maps).

These case studies attempted to communicate the benefits of PRTR data to study participants and, in so doing, revealed obstacles facing these communities. Such obstacles include a lack of coordination among community environment departments and external agencies and, in particular, the lack of resources to fund impact studies and the expertise required to carry out the studies.

Despite these challenges, it is anticipated that PRTR data can become an important resource for environmental health research in tribal and indigenous communities across North America. With the knowledge gained through these case studies, the CEC may evaluate ways to make PRTR information more accessible and meaningful to tribal and indigenous communities in North America.

