



## California Council for Environmental and Economic Balance

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February 1, 2013

Arsenio Mataka  
Cal/EPA Assistant Secretary  
1001 I Street  
Sacramento, CA 95814

George Alexeef  
Director, OEHHA  
1001 I Street  
Sacramento, CA 95814

RE: CalEnviroScreen (January 2, 2013) Draft Report, Model and Policy Guidance

Dear Mr. Mataka and Dr. Alexeef,

The California Council for Environmental and Economic Balance (CCEEB) is a non-partisan, non-profit coalition of business, labor, and public leaders that advances balanced policies for a strong economy and a healthy environment. As a member of the Cal/EPA Cumulative Impacts & Precautionary Approaches (CI/PA) Working Group and the Cal/EPA Environmental Justice Advisory Committee before it, we have worked with Cal/EPA and its boards, departments and offices (BDOs) on implementing environmental justice programs and policies since the late 1990s. We appreciate the hard work and dedication your staffs have brought to this area, and the incredible public outreach that Assistant Secretary Mataka, Director Alexeef and the Office of Environmental Health Hazard Assessment (OEHHA) have led over the past year. We also thank you for your continued willingness to consider our comments. We believe much progress has been made.

This letter is to transmit our final comments on the draft report and screening model, as well as the Cal/EPA guidance memo (dated January 3, 2013) on policy uses for CalEnviroScreen. In summary, CCEEB has two major concerns that we believe need to be fixed before CalEnviroScreen is deemed final:

1. CalEnviroScreen, like any screening tool, lacks the scientific precision needed for regulatory decision-making. Unfortunately, this limitation of screening tools is

often unacknowledged or misunderstood, causing screening results to be misused or misapplied.

RECOMMENDATION: Cal/EPA and OEHHA should add language to the guidance memo and report clearly describing inappropriate uses, that is, that CalEnviroScreen should not be used within the context of CEQA, permitting, or any other regulatory actions, including land use decision making. Cal/EPA should also describe how it intends to ensure accountability for use of the tool, including use by those outside of the agency and its BDOs.

2. Technical flaws in the screening methodology and selected indicators persist, making results from CalEnviroScreen unreliable and at times irrational. (CCEEB discusses the methodology on page 5 and individual indicators on page 8.)

RECOMMENDATION: Cal/EPA and OEHHA should fix outstanding technical flaws with the indicators and revise its methodology *before* it finalizes CalEnviroScreen and uses results for its stated purpose of identifying communities for prioritization of agency resources. If the methodology cannot be fixed in time for “version 1.0” this spring, then it should be OEHHA’s priority to correct the methodology as soon as possible.

CCEEB has two additional concerns that can easily be addressed with relatively minor revisions to the report and guidance memo.

1. CalEnviroScreen, the report, and the guidance memo confuse concepts related to cumulative impacts, pollution burden, vulnerability, and disadvantage. CCEEB is particularly concerned with the limited view of vulnerability, as the report seems to suggest that communities are *only* vulnerable to the effects of pollution exposure rather than vulnerability based broadly on socioeconomic disadvantage.

RECOMMENDATION: Sections on vulnerability should be revised so that vulnerability is treated as an independent factor rather than a dependent one; the report should also acknowledge and discuss how socioeconomic disadvantage is the primary factor influencing health disparities, regardless of pollution.

2. Uncertainties in the underlying data and limitations on how screenings can be used are poorly characterized in the report. (CCEEB offers detailed examples starting on page 9.)

RECOMMENDATION: Cal/EPA should expand the section on uncertainties and include discussion of the scientific limitations of CalEnviroScreen.

CCEEB is committed to working with Cal/EPA and OEHHA on the resolution of these issues and successful implementation of CalEnviroScreen. In the spirit of that commitment, what follows are more detailed comments on each of the points above.

## Use of Results in Policies and Programs

In general, CCEEB supports using CalEnviroScreen to help prioritize communities for purposes of allocating agency resources if the model is modified to correct outstanding technical flaws. The use of screening tools for resource allocation and prioritization has been successful in the past, most notably in work by the state's air districts to identify communities for the Carl Moyer Program.<sup>1</sup>

Because CalEnviroScreen does not and cannot show evidence of causation (i.e., why health effects are occurring and who or what is proportionally responsible) its results are not appropriate as the basis for regulatory decisions.<sup>2</sup> This would include any use in the context of CEQA, permitting, and land use decision-making. Similarly, results are not appropriate for assigning responsibility for environmental or public health effects, nor should they be used to mandate additional mitigation or investment by private entities. CCEEB strongly advises Cal/EPA to clearly state in its guidance memo and report that CalEnviroScreen is inappropriate for regulatory decision-making or as proof of harm. Finally, we ask Cal/EPA to explain how it will ensure accountability for how the tool is applied (or misapplied) at the local and regional levels.

## “Disadvantage” and “Vulnerability” are Independent, Not Dependent Factors in Health Outcomes and the Primary Reason for Health Disparities

CalEnviroScreen quickly devolves into semantic confusion, interchanging concepts about cumulative impacts, pollution burden, disadvantage, and vulnerability without ever stopping to define or distinguish among them.<sup>3</sup> While it is all too tempting to dismiss the

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<sup>1</sup> AB 1390 requires any air quality management district or air pollution control district with a population of one million residents or greater to expend not less than 50% of Carl Moyer Program funds in a manner that directly reduces air contaminants or the public health risks associated with air contaminants, in communities with the most significant exposure to air contaminants or localized air contaminants, or both, including communities of minority populations or low-income populations or both.

<sup>2</sup> See EPA, Region 9 comments dated September 27, 2010 and resubmitted on October 16, 2012: “Use of the tool: EPA agrees that the screening methodology should be used to prioritize programmatic targeting and to identify and compare impacted communities relative to others. We encourage Cal/EPA and OEHHA to work towards developing a more robust cumulative impacts assessment tool capable of supporting actual environmental and regulatory decision-making. It is our hope that future efforts will focus on methods that can ultimately be incorporated into a more traditional risk analysis framework.”

<sup>3</sup> Memo, p3: “For example, CalEnviroScreen will inform Cal/EPA's implementation of the mandate to identify disadvantaged communities contained in SB 535. The bill requires Cal/EPA to identify disadvantaged communities based on geographic, socioeconomic, public health, and environmental hazard criteria.”

Report Preface, p1: “It is important to identify disadvantaged communities that face multiple pollution burdens so programs and funding can be targeted appropriately toward raising the economic and environmental status of the most affected communities. For this reason, Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) developed a science-based tool for evaluating multiple pollutants and stressors in communities, the California Communities Environmental Health Screening Tool (CalEnviroScreen).”

Report Preface, p1: “CalEnviroScreen shows which portions of the state have higher vulnerabilities and burdens as compared to other areas...”

need for clarity in a rush to action—any action—we believe careful consideration of these terms is critical because it leads to the fundamental questions: What problem are we trying to solve? and Do we have the right tools to solve the problem?

Indeed, only “cumulative impacts” has a definition, or more correctly, it has at least two, and neither quite the same. One is a working definition at Cal/EPA, meant to have been tested and refined during the pilot projects, which were undertaken as part of the agency’s EJ Action Plan. (Lessons learned from the pilots were never addressed at the CI/PA Working Group, nor have they influenced development of CalEnviroScreen.) The other is the definition under CEQA, whose interpretation is the subject of much case history.

Vulnerability is yet a different phenomenon, although it can overlap with cumulative impacts in that the same communities might suffer from *both* high levels of exposure to pollution *as well as* socioeconomic vulnerability. Thus, these burdens may be correlated and co-located, but the pollution cannot be said to be reason for the community’s socioeconomic status (SES). (Similarly, not all highly exposed communities are low-SES, nor all low-SES communities highly exposed; these factors are not dependent.)

Communities with low-SES are vulnerable to health disparities stemming from a broad range of factors, only one of which may be pollution. Such factors might include access to medical care, access to fresh and affordable foods, psychosocial stress, violence in the home or community, un- and underemployment, poor indoor air quality and quality of housing stock, or problems with the built environment and a lack of infrastructure, to name but a few. While CalEnviroScreen seeks to capture some of these dynamic and overlapping issues under “Population Characteristics,” it looks at them *only* as modifying the effect of pollution rather than their significant role as independent factors influencing health outcomes. That is, CalEnviroScreen assumes that pollution is the sole factor contributing to health impacts, and that SES *only* intensifies this problem (i.e., vulnerability is a dependent factor to pollution exposure, and pollution exposure is driving all health disparities). This limited understanding of vulnerability completely ignores the fact that SES is the main factor influencing how healthy a person or community is, regardless of pollution burden.<sup>4</sup>

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Report, p1: “Some Californians are more vulnerable to the effects of pollution than others. This document describes a science-based method for evaluating multiple pollution sources in a community, while accounting for a community’s vulnerability to pollution’s adverse effects.”

<sup>4</sup> Background references include:

Health Affairs, March 2002; Volume 21, Issue 2; The Determinant of Health. See sections on Income & Health, Socioeconomic Status & Health, and Disparities & Policy.

World Health Organization Commission on Social Determinants of Health, final report, “Closing the gap in a generation: Health equity through action on the social determinants of health,” 2008.

Bay Area Regional Health Inequities Initiative report, “Health Inequities in the Bay Area,” 2008.

UCSF MacArthur Research Network on Socioeconomic Status and Health publication, “Reaching for a Healthier Life: Facts on Socioeconomic Status and Health in the U.S.,” 2007.

Annals of the New York Academy of Sciences, February 2010; Volume 1186, The Biology of Disadvantage: Socioeconomic Status and Health.

CCEEB supports and appreciates the revision to CalEnviroScreen that simplified it to two core components: pollution burden + population characteristics. By our understanding, the latter component is meant to capture vulnerability to negative health impacts as well as socioeconomic disadvantage. However, the interaction between these two components of pollution and population remains unclear, and likely differs across each community. Thus, a screening tool can suggest that a community should be prioritized and investigated, but it does not tell us what problem we are trying to solve or how best to go about solving it. These “what” and “how” questions require further community-level assessment.

This confusion over semantics and treatment of vulnerability isn't so much a problem when implementing no-harm solutions, as is the case with things like grants and incentives. For this reason, CCEEB supports and approves a scientifically sound screening method to prioritize communities for allocating agency resources. However, some proposals advanced by community and environmental advocates call for restrictions or even outright bans on economic development, under the theory that there should be “no net increase” in pollution for “already overburdened” communities, regardless of the fact that sources are already complying with federal, State, and local regulations as well as CEQA. Again, we reiterate our concern that screenings lack the scientific precision needed to determine whether a community is, in fact, disproportionately impacted by pollution exposure, and screenings cannot determine the specific or exact sources of pollution. As such, screening results should not serve as justification for regulations or permitting.

### **CalEnviroScreen Should Use a Matrix, Not Multiplier Method**

Further improvement to the model can and should be made so that the difference between pollution burden and socioeconomic vulnerability is better communicated and made scientifically defensible. As discussed at the September 7, 2012 academic panel, the multiplier has no scientific justification and misapplies principles of risk assessment. The US EPA (2012) Dose-Response Assessment reference cited on page 8 supports this point: “Many organizations use numerical priority-scoring formulas such as  $\text{Risk} = \text{Threat} \times \text{Vulnerability}$ . . . . Such multiplication is valid when the components of the right side are uncorrelated.” (Emphasis added; indicators used in CalEnviroScreen are heavily correlated, not uncorrelated.)

It is worth noting that the multiplicative approach reflects the narrower view of vulnerability discussed in the previous section, whereby vulnerability is dependent on pollution exposure and is only seen as an effects modifier. A second and more fundamental problem with the multiplicative approach is that it results in a combined numeric score that is both hard to understand and easy to misinterpret. This makes applying results a challenge.

By dropping the multiplicative approach and shifting to a matrix, policy makers would have more flexibility using the model and could better tailor results to the problems or solutions under consideration. And, unlike the multiplicative approach, the matrix

approach treats each component (pollution burden and population characteristics) as *independent* factors. Because the matrix would not be drawing causal linkages between the two components, it does not need a scientific justification. A matrix would incorporate exactly the same indicators as the current model that produces numeric “CES” scores, and priority communities would be those identified as both highly burdened by pollution *and* highly disadvantaged or vulnerable because of population characteristics. Such a model might look like Figures 1 and 2.1 below.

Figure 1 Example of Matrix: Zip Codes with CES Scores 49.0 – 50.16 (Top 1-5%)

|                                |        | CES Score: Population Characteristics                             |                                |     |
|--------------------------------|--------|---|--------------------------------|-----|
|                                |        | High  | Medium                         | Low |
| CES Score:<br>Pollution Burden | High   | Sun Valley 91352  | Ontario 91761<br>Norwalk 90650 |     |
|                                | Medium | Los Angeles 90044<br>Los Angeles 90061<br>San Bernardino<br>92410 |                                |     |
|                                | Low    |   |                                |     |

Table 1 CES Scores by Component and Total Score

| Zip Code | CES Score | % Statewide | Pollution Burden | Pop. Char. |
|----------|-----------|-------------|------------------|------------|
| 91761    | 50.16     | 1-5 %       | 8.8              | 5.7        |
| 90650    | 50.16     | 1-5 %       | 7.6              | 6.6        |
| 90044    | 49.88     | 1-5 %       | 5.8              | 8.6        |
| 90061    | 49.59     | 1-5 %       | 5.7              | 8.7        |
| 92410    | 49.02     | 1-5 %       | 5.7              | 8.6        |
| 91352    | 49.00     | 1-5 %       | 7                | 7          |

In this example, we look at six communities that score between 49.00 and 50.16 – scores that might suggest these communities are equally “impacted.” All of these zip codes fall within the top 1-5% for total CES scores. However, with the matrix, we can more clearly discern which dimension (pollution vs. pop. characteristics) is more likely driving the final results. Half of these communities (90044, 90061 and 92410) are in the mid-range of total possible pollution burden scores, and the final scores are largely driven by population characteristics. In fact, about 260 zip codes score higher than 5.8 and 5.7 for pollution burden, meaning that almost 15% of all zip codes have higher pollution burden scores than these three zip codes. Similarly, we see that two of these zip codes (91761 and 90650) score high for pollution burden, but are only mid-range for population characteristics. Only one zip code (91352) scores high across both dimensions of pollution burden *and* population characteristics, yet it has the lowest combined score of the group.

Figure 2.1 Example of Matrix: Adjacent Zip Codes in and around San Bernardino

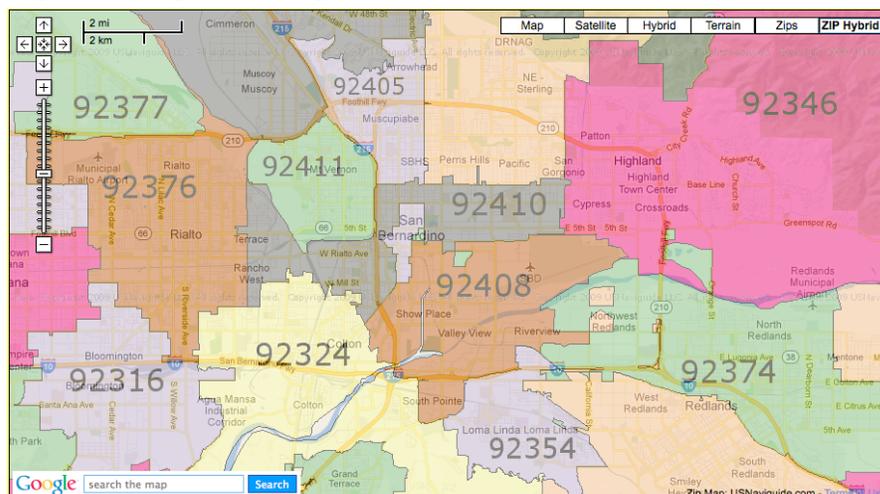
|                                |        | CES Score: Population Characteristics |        |     |
|--------------------------------|--------|---------------------------------------|--------|-----|
|                                |        | High                                  | Medium | Low |
| CES Score:<br>Pollution Burden | High   | 92408                                 | 92374  |     |
|                                |        | 92316                                 | 92373  |     |
|                                |        | 92324                                 |        |     |
|                                | Medium | 92376                                 | 92377  |     |
|                                |        | 92411                                 | 92346  |     |
|                                |        | 92401                                 | 92354  |     |
| 92405                          |        | 92313                                 |        |     |
| Low                            |        |                                       |        |     |

RED = 1-5%, Orange = 6-10%, Blue = 11-15%, Green = 16-20%, Purple = 21- 45%

Table 2 CES Scores by Component and Total Score

| Zip Code | CES Score | % Statewide | Pollution Burden | Pop. Char. |
|----------|-----------|-------------|------------------|------------|
| 92408    | 57.67     | 1-5 %       | 7.3              | 7.9        |
| 92316    | 53.28     | 1-5 %       | 7.4              | 7.2        |
| 92324    | 51.83     | 1-5%        | 7.1              | 7.4        |
| 92410    | 49.02     | 1-5%        | 5.7              | 8.6        |
| 92376    | 48.36     | 1-5 %       | 6.2              | 7.8        |
| 92411    | 47.17     | 1-5 %       | 5.3              | 8.9        |
| 92401    | 46.55     | 6-10 %      | 4.9              | 9.5        |
| 92405    | 41.87     | 6-10 %      | 5.3              | 7.9        |
| 92404    | 36.90     | 11-15 %     | 4.5              | 8.2        |
| 92377    | 34.72     | 16-20 %     | 5.6              | 6.2        |
| 92346    | 34.16     | 16-20 %     | 5.6              | 6.1        |
| 92354    | 33.06     | 16-20 %     | 5.8              | 5.7        |
| 92374    | 32.90     | 21-25 %     | 7                | 4.7        |
| 92373    | 29.24     | 26-30 %     | 6.8              | 4.3        |
| 92313    | 20.70     | 41-45 %     | 4.5              | 4.6        |

Figure 2.2 Zip Code Map for San Bernardino Area



In the next example, we look at a cluster of zip codes in and around the City of San Bernardino. Again in this example, we see a few anomalies. Five of the top scoring zip codes

(92410, 92376, 92411, 92401 and 92405) have only mid-range pollution burden scores, yet have some of the highest scores for population characteristics. (Indeed, 92401 has the single highest population characteristics score in the entire state.) Two communities (92374 and 92373) have high pollution burden scores, but only fall in the top 21-30% overall, and so likely would not be prioritized based on their total CES score alone. Neither of these examples is meant to argue that pollution scores are more important than population characteristic scores, or vice versa. They are simply provided to show how information in the matrix is easier to understand than the numeric CES scores, particularly when one is trying to determine how the total score is influenced by either of the model's two core components.

Finally, we must note that because screenings make only relative comparisons (with imperfect and incomplete data); neither the matrix nor the multiplicative method tells us whether impacts are disproportionate, or what the root cause of health outcomes is, or how communities change over time. For this, a community-level assessment would be needed. In the past, Cal/EPA has acknowledged the need for a more precise assessment method. For example, in 2005, and as part of its work on cumulative impacts, OEHHA was looking at (1) the issue of background, additivity, and synergy from multiple exposures over time, and (2) the degree to which impacts in a given community are disparate.<sup>5</sup> The screening tool does not accomplish either of these tasks. Therefore, as stated previously, CCEEB strongly recommends Cal/EPA state clearly that the CalEnviroScreen tool cannot be used for CEQA, regulatory permitting or land use decision-making purposes.

### Cal/EPA and OEHHA Must Fix Remaining Technical Flaws

In addition to our concern about the multiplicative approach, CCEEB supports and incorporates by reference technical comments provided by Sierra Research, dated February 1, 2013. Some of the key points raised by Sierra Research include:

- OEHHA provides no scientific justification for the 10x magnitude of modulating pollution burden by population vulnerability.
- OEHHA added a new indicator to CalEnviroScreen for diesel particulate matter (DPM). This indicator should be removed from the model. The DPM indicator is duplicative of, and potentially correlated with, two other indicators already present in the model: traffic density and, to a lesser extent, PM<sub>2.5</sub> concentrations. (We noted this concern during the January 11, 2013 CI/PA Working Group meeting, with acknowledgement by OEHHA staff that there is “overlap” among indicators.) Thus, the DPM indicator is flawed and redundant, and should not be used.
  - OEHHA augmented the NATA data with modeling of ambient DPM concentrations by the California Air Resources Board (CARB) at ports and railyards. The database cannot be corrected by simply adding one or more facilities or source categories; such *ad hoc* adjustments distort the

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<sup>5</sup> See OEHHA's paper on Proposed Working Definition for “Multimedia Cumulative Impacts,” February 4, 2005.

results. If NATA does not properly account for these significant sources, then other significant omissions could exist for which OEHHA does not adjust.

- EPA has stated that NATA data should not be used “to characterize or compare risks at local levels such as between neighborhoods.”<sup>6</sup> OEHHA should not use those values at the localized level in the CalEnviroScreen tool. In fact, the NATA DPM concentrations are derived (secondary) data, developed from emission inventories only at the county level, and are disaggregated to census tracts using surrogates.
- The PM<sub>2.5</sub> indicator should be changed to focus on emissions above the health-based ambient air quality standards, not total PM concentrations. A better indicator of exposure would evaluate PM<sub>2.5</sub> concentrations in excess of the federal standard.
- The data used for the asthma indicator do not match the provided rationale in the draft report.
- The low birth weight indicator appears to be essentially duplicative of the poverty indicator. OEHHA staff should conduct sensitivity analysis to see if it can be removed.
- The age indicator (children and elderly) is not consistent with treatment of age used elsewhere by OEHHA (e.g., cancer risk-assessment age adjustments).

### Cal/EPA Must Expand the Section on Uncertainty

Beyond the technical flaws, which must be fixed or in the very least acknowledged, CalEnviroScreen has inherent limitations and uncertainties that should be made more explicit. CCEEB strongly recommends that Cal/EPA and OEHHA expand the section on uncertainties to discuss the following:

- Double and triple counting of factors, and inclusion of confounding factors.
- Proximity indicators (i.e., environmental effects and pesticide use) assume exposure when there may be de minimis or no exposure at all. The report states that, “Effects can be immediate or delayed,” thereby implying without question that exposure occurs. This misstates the meaning of the data.
- The use of percentile scores for indicators, rather than normalized actual values, contributes to the unexpected predictions of the tool. The current scoring approach dilutes the effect of extraordinarily high impacts for certain indicators, and inaccurately magnifies it for others.
- Similarly, ranking each indicator creates bright lines between good and bad that may not actually exist.
- Air quality data are interpolated from about 100 monitoring stations; the farther away from monitors, the less accurate data becomes. When forcing data into zip codes or census tracts, the finer the geographic resolution, the greater the risk for error.

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<sup>6</sup> EPA, *An Overview of Methods for EPA’s National-Scale Air Toxics Assessment* (January 31, 2011), p. 5.

- The linguistic isolation indicator might underweight African American populations and double-count Asians and Hispanics.
- CalEnviroScreen misses many small sources, unpermitted stationary sources, and unreported sources that are not included in the TRI data.<sup>7</sup> This causes communities exposed by clusters of such sources to be undercounted as compared to communities with large stationary sources that must conservatively report chemical releases.

CCEEB and its members look forward to seeing the final report, screening tool and guidance memo this spring. In the meantime, if you or your staffs would like to discuss our comments further, we would be pleased to meet with you at any time. Please contact Janet Whittick of CCEEB (janetw@cceeb.org). Finally, we appreciate and commend efforts by OEHHA to translate CalEnviroScreen results into a robust Google Map data layer that contains all indicator scores – this is a powerful visual aid, and with the enhancements to come from fixing remaining technical flaws, we hope that CalEnviroScreen can be a valuable tool used to inform and improve Californian communities.

Thank you once again for allowing CCEEB to participate in this process and for consideration of our views.

Sincerely,



Gerald D. Secundy  
CCEEB President



Bill Quinn  
CCEEB Vice President and CI/PA Working  
Group Member

cc: Secretary Matt Rodriquez, Cal/EPA  
Director Ken Alex, Governor's Office of Planning & Research  
Kendra Daijogo, CCEEB Air Project Manager  
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<sup>7</sup> Examples of TRI data gaps include mobile sources, dry cleaners, auto service stations, hospitals, airports, and Superfund or “brownfield” sites. From the EPA website: “Pollution sources that are not covered by TRI probably account for the vast majority of environmental releases of most chemicals.”  
[[http://scorecard.goodguide.com/general/tri/tri\\_source.html](http://scorecard.goodguide.com/general/tri/tri_source.html) on February 1, 2013]