Appendix C

Guidance for Submitting P2 Measurement Information

I. Introduction: As noted in **Section I.B.8** of the RFP, applicants must provide quantitative estimates of outcomes and outputs of P2 project activities. P2 project outputs are fairly straightforward to document, however, selecting, documenting and tracking P2 outcomes requires more time and attention. This guidance is provided to assist the applicant in describing the project characteristics and documenting P2 outcome data. **Section II** of this guidance provides **examples** of what to include in the grant proposal and offers a sample table to demonstrate how to present P2 outcome information. **Section III** provides examples of how to describe P2 outcomes, and **Section IV** provides reference material on gathering, understanding and documenting P2 outcomes.

II. Presenting P2 Measurement Information: To address the measurement requirements, the proposal may include P2 outputs, but should also include at least one P2 project that will result in numeric P2 outcomes within the grant project period. The proposal should include the following measurement elements (items 1- 4 listed below) for each P2 project that is expected to be measured for numeric outcome results.

A. Measurement Elements – there are four necessary components to include in the proposal:

1. Project Overview: A list of the project's characteristics:
- Project title;
- Outputs;
- Behavioral Measures;
- Partners; and
- Target Sector

2. Data Collection: A description of the relevant data collection methods, e.g., surveys, pre/post tests, the participant reporting arrangements, etc.

3. Estimating P2 Outcomes: Numeric estimates of pollution prevention outcomes per project.

4. Calculation of P2 Outcome Results: A description of the equations and methodologies used to calculate the estimated pollution prevention results.

B. Documenting the Information – the type of information to provide.

1. Project Overview: This section provides a "snap shot" of the proposed project by providing brief responses to the following five project characteristics:
- Project title;
- Outputs;
- Behavioral measures;
- Partners; and
- Target sector

A sample description is provided below:

- Project title: Green Hotels Project;
- Outputs: The project will organize five three-hour workshops followed by on-site environmental audits and technical assistance for up to ten participating facilities;
- Behavioral measures: Number of workshop attendees that join the Green Hotels Project;
- Partners: State hotel and motel association, state visitors and tourist bureau; and
- Sectors: Hotel and hospitality businesses

2. **Data Collection:** By writing a short description of the data collection method, applicants take a proactive approach towards measurement by selecting the most appropriate data collection tool(s) and thinking through the logistics of the measurement process. As described in **Section IV.A** of this appendix, requested data may include surveys (mail, fax, e-mail, Internet, and phone) and observed data (on-site revisits, pre/post tests, and reviews of self-reported data).

Note: The steps to institute measurement (i.e., measurement planning, data collection, data analysis and reporting) should be reflected in the budget detail and the project timeline. A sample explanation is provided below.

- **Data Collection Description:** The data collection effort for the Green Hotels Project will begin with a pre/post survey conducted at each of the 5 workshops. The survey will assess the change in the level of environmental awareness of workshop participants and collect baseline facility information. P2 outcome measures will be collected as part of a voluntary program in which participating hotels will receive technical assistance from P2 staff and, in return, provide self-reported data for pounds of pollution prevented, energy and water conserved, and dollars saved.

3. **Estimating P2 Outcomes:** The following table is a sample description showing how to present estimated P2 outcome information in an acceptable format. As illustrated in the table, the "Green Hotels Project" expects to yield numeric P2 outcomes from the listed "P2 Efforts." The number of "Pounds of Pollutants Reduced" is totaled in column (g). The underlying calculation for each estimated outcome is described in **Section IV.C** of this appendix.

Note: Refer to **Section IV.B** of this appendix for criteria of the outcome categories, including pounds of pollution prevented, metric tons of carbon equivalent reduced ($MTCO_2e$) conserved, gallons of water conserved, and dollars saved.

Table 1 **Estimated P2 Outcomes for the Green Hotels Project**

	Pounds of Hazardous Materials Reduced						Resources Conserved and Dollars Saved			
(a) P2 Efforts	(b) Haz. Inputs	(c) Haz Waste.	(d) Air Poll.	(e) Waste Water	(f) Total Lbs		(g) Solid Waste	(h) $MTCO_2e$	(i) Gallons	(j) Dollars
1. Water conservation									50,000	$6,844
2. Green cleaning				500						
3. Organic lawn care					200					
4. Efficient Lighting								34.7		
Total:				500	200			34.7	50,000	$6,844

III. Describing P2 Outcomes – Proposals will need to include the following information: underlying assumptions, environmental factors, and the logic used to calculate the expected project outcomes.

A. Sample descriptions – The sample descriptions that follow cover the first two P2 efforts listed in Table 1 (i.e., water conservation and green cleaning).

1. **Water Conservation:** Four workshops will reach an expected audience of 50 hotels. Of these, 5 hotels, representing approximately 500 bed spaces, are expected to adopt water efficiency practices within two years. A typical U.S. hotel uses 100 gallons of water per day per occupied room (water used for toilet, bathing, hygiene and laundry). Assuming a 50 percent occupancy rate, the 5 participating hotels use approximately 9,125,000 gallons of water per year. New water-efficient shower and faucet fixtures combined with an "Eco Linen" program are expected to result in a savings of 15 percent or 1,368,750 gallons conserved per year. With water and sewer rates at approximately $5.00 per 1,000 gallons, the estimated cost savings are $6,844.

2. **Green Cleaning:** It is expected that a total of five hotels will provide self-reported data on the amount of cleaning products that are converted to environmentally preferable cleaners. It is estimated that, on average, each hotel room requires the use of two pounds of cleaning products per year for a total annual usage of 1,000 pounds for 500 rooms. It is expected that the participating hotels will convert half of their cleaning products to green cleaners within two years. Furthermore, assuming 50 percent occupancy rate, it is expected that a shift to green cleaners will result in 250 pounds of in-product source reduction per year.

IV. Background Information on Gathering, Understanding and Documenting P2 Outcomes: The three sections that follow are provided to give the applicant additional resources for gathering data, having a better understanding of the environmental measures used in Table 1 and using the most beneficial method to document P2 outcomes.

A. Possible Data Collection Methods:

1. **Pre/Post-Test:** Before conducting the pollution prevention assistance activity (e.g., workshops, training sessions), consider testing attendee knowledge of the subject you plan to cover. At the end of the assistance activity, retest the participants to determine changes in understanding of the materials presented. Similarly, you can assess behavioral practices at the facility before a workshop and practices reported in a follow-up survey to identify changes made. Pre/post-tests can also help you improve your pollution prevention assistance materials by revealing areas where key messages did not come across.

2. **Telephone Survey:** A telephone survey is a standard set of questions asked to potential respondents over the telephone. These surveys used alone or in combination with mail or online surveys allow you to ask follow-up or clarifying questions, potentially resulting in better data than a mailed survey. Telephone surveys work best if the list of potential respondents is a manageable number (e.g., less than 50 respondents). To reduce costs, some regions have hired college students to make the call-backs.

3. **Mail/Email/Fax Survey:** A mail, e-mail, or fax survey is a set of questions sent to potential respondents with a request that they voluntarily respond. These surveys enable you to reach a large number of potential respondents, and may be the best option where there are more than 50 recipients. However, mail/e-mail/fax surveys can provide ambiguous results, since it is not easy to immediately follow up and clarify unclear, conflicting, or unexpected responses. Similarly, a limited level of detail is obtained, as respondents will generally not spend the time to write long answers to open-ended questions.

4. **Online Survey:** An online survey is a set of questions posted on a Web site or list serve. These surveys have the potential to reach a large number of respondents. For surveys on websites, you can reach users that might otherwise be unknown to you. Many respondents like online surveys because they can respond at their convenience and they do not need to worry about losing a survey or mailing it back. As with mail surveys, however, the online survey may provide limited detail as respondents might not want to spend time typing in a longer response. In addition, without follow-up, there is potential for ambiguity or conflicting results, as with the mail survey.

   Note: Pre/post-tests, telephone surveys, mail/e-mail/fax surveys, and online surveys are exempt from the Paperwork Reduction Act (PRA) if administered under a grant agreement. However, the PRA is applicable if administered as part of a cooperative agreement with EPA.

5. **On-site Revisit:** Onsite revisits involve returning to facilities that previously received an assistance visit. Revisiting facilities can provide excellent data since you can use direct observation to make assessments and because facilities are likely to spend the necessary time to answer questions while you are on site. In addition, the revisit itself might spur additional compliance assistance or pollution prevention activities.

6. **Self-Reported Data:** Facilities may provide self-reported data that shed light on their environmental performance. This could include in-house data such as energy and water bills, material and waste management receipts, permits, and Toxic Release Inventory (TRI) forms. Facilities may also supply source reduction information as part of a voluntary environmental program, such as an annual pollution prevention awards program, an ongoing environmental recognition program, or other voluntary partnerships.

B. Further Explanation of P2 Outcome Categories:

1. **P2 Efforts [column (a)]:** list the source reduction activities that are expected to yield P2 outcome results. For grants/cooperative agreements with multiple projects, at least one project must be included. In the example above, the "Green Hotels Project" resulted in 4 activities that exhibited expected outcome measures.

2. **Pounds of Hazardous Materials Reduced:** The four categories that comprise "Hazardous Materials Reduced" are described below. Column (f) sums the total pounds of pollutants prevented. Reductions are achieved through source reduction efforts, including in-process recycling. Measurements are expressed in pounds/year.

   - Hazardous Inputs and Wastes **[columns (b & c)]:** The measure for hazardous inputs and waste refers to state and/or federally-listed hazardous wastes or toxic wastes meeting the criteria for ignitability, toxicity, corrosiveness or reactivity. This could include hazardous materials used as process inputs (chemical ingredients, paints, and solvents), hazardous products applied to land (such as pesticides and nutrients not applied, etc) and hazardous wastes. Excluded: non-hazardous waste (solid waste, construction debris, packaging, paper, glass and aluminum cans).

   - **Air Pollutants [column (d)]:** The measure for air pollutants is considered to include the release of any of the following: toxic air emissions (this includes Clean Air Act Section 112b hazardous air pollutants (HAPs), Toxic Release Inventory (TRI), and others), nitrogen oxides (NOx), sulfur oxides (SOx), particulate matter (PM) and Volatile Organic Compounds (VOCs). This criterion takes in account pollutants to air, including NOx and SOx from boilers, but excludes NOx or SOx from utilities (due to cap and trade limitations).

   - **Waste Water [column (e)]:** "Waste Water" refers to biochemical oxygen demand (BOD), chemical oxygen demand (COD), toxics, nutrients, non-filterable total suspended solids (TSS), contaminants in storm water and pathogens discharged to sewer systems, septic systems, injection wells, and

- ground water. Pounds of waste water are calculated by estimating the quantity of contaminant rather than the quantity of water.

- **Total pounds [column f]:** The number of total pounds accumulated from the P2 efforts noted in the table refers to water conservation, green cleaning, organic lawn care and efficient lighting.

3. **Resources Conserved and Dollars Saved:** The four categories that comprise "Resources Conserved and Dollars Saved" are described below.

   - **Solid Waste [column g]:** Solid waste refers to non-liquid, non-soluble materials including industrial wastes, sewage sludge, agricultural refuse, demolition wastes, packaging, and mining residues.

   - **$MTCO_2e$ [column (h)]:** This column refers to Metric Tons of Carbon Dioxide Equivalent reduced.

     Note: Grantees will be asked to report to the Region in $MTCO_2e$ to reflect the true capacity that the grantee can document and track results. However, on a programmatic level, the P2 program and the Agency, document and track greenhouse gas results using the measures $MMTCO_2Eq$ and MMTCE respectively. These measures are used when results are provided in an aggregated format. For additional information on metrics that express greenhouse gas emissions, please go to: http://www.epa.gov/OMS/climate/420f05002.htm.

   - **Gallons [column (i)]:** This column lists the reduction in gallons of incoming raw water from outside sources through the implementation of P2 activity. Reductions can occur for operations, facility use and grounds maintenance.

     Note: If you expect reductions in pounds of hazardous materials from practices that reduce wastewater, gallons of wastewater reduced can equal gallons of water saved.

   - **Dollars [column (j)]:** This column lists the financial savings in dollars derived from the outcome of implementing a P2 activity (including materials, labor, energy, machinery, administrative, waste management, or other process costs).

     Note: EPA is developing a P2 cost calculator that grantees can use to calculate these benefits.

C. Background on Documenting P2 Outcomes:

The following descriptions are provided to help document P2 outcomes.

1. **Establish a Baseline:** Baseline performance information represents the current status of the target audience or sector and provides a frame of reference for measuring the success of the intended pollution prevention project. Baseline information can be expressed in terms of the amount of pollution generated over a period of time (e.g., pounds of pollution per year); the amount of material, products, water, and/or energy used over a given time (e.g., kW hours consumed per year); and amount of dollars spent over a given time (e.g., dollars spent per year). Baseline information can be established by: 1) using relevant databases, records, reports, and studies; 2) surveying the facility or target audience; and, 3) using pre-existing baseline information.

   Here are some examples:

   - A manufacturer generates about 4,000 gallons/month of oily wastewater from washing operations used to clean machined, metal parts for a cost of $0.40/gallon; and
   - On average, hospitals use between 250 and 400 gallons of water per day per bed.

2. **Determine the Efficiency of the P2 Effort:** Identify the expected source reduction benefit of the P2 practice, product or technology. This benefit should be expressed in terms of pollution reduced, energy saved, water conserved, and costs avoided. This efficiency factor should come from reliable sources or sound analysis.

   Here are some examples:

   - High-solid auto body paints reduce VOC emissions by up to 75 percent;
   - Manufacturing one ton of office paper with 100 percent recycled content can save nearly 3,000 kilowatt hours when compared to the manufacture of virgin paper;
   - ENERGY STAR qualified transformer can save $100-300 each year at an electricity rate of $0.075 cents per kWh;
   - Ergonomic high volume, low pressure (HVLP) guns result in paint savings of up to 50 percent over conventional air spray guns, and savings of 35 percent over conventional HVLP guns; and
   - Ultrafiltration (UF) membrane technology can reduce the volume of oily wastewater by at least 80 percent by separating out clean water from the oily solution.

3. **Estimate the Degree of Impact:** Estimate the degree to which the P2 objectives will be implemented by the target audience. First, gauge the percentage of expected participation. Second, determine the degree to which participants will adopt P2 suggestions.

Here are some examples:

- If representatives from 30 marinas attend a workshop, 10 marinas are expected to implement suggested P2 practices within a two-year period. Of these, half are expected to install a high-efficiency spray gun for painting operations; and
- Six of the ten facilities participating in an environmental management system (EMS) user-group are expected to complete their EMS by the end of the year.

Note: By identifying the target audience's performance baseline, the expected efficiency of the P2 effort, and the degree of impact, you will have all the elements to document P2 outcomes.