GOAL 1 OBJECTIVE 1

<u>FY 2011 Performance Measures</u>:

- **Tons of SO_2 emissions from electric power generation sources (tons/yr from 1980 baseline) (program assessment measure)**

Performance Databases:

Emissions Tracking System (ETS) - SO_2 and NO_x emissions
- Clean Air Status and Trends Network (CASTNET) - dry deposition
- National Atmospheric Deposition Program (NADP) - wet deposition
- Temporally Integrated Monitoring of Ecosystems program (TIME) - surface water chemistry

Long-Term Monitoring Network program (LTM) – surface water chemistry

Data Sources: On a quarterly basis, ETS receives and processes hourly measurements of SO_2, NO_x, volumetric flow, CO_2, and other emission-related parameters from more than 3,400 fossil fuel-fired utility units affected under the Title IV Acid Rain Program. These measurements are collected by certified continuous emission monitoring systems (CEMS) or equivalent continuous monitoring methods.

CASTNET measures particle and gas acidic deposition chemistry. Specifically, CASTNET measures sulfate and nitrate dry deposition and meteorological information at approximately 88 monitoring sites, primarily in the East. CASTNET is a long-term dry deposition network funded, operated and maintained by EPA's Office of Air and Radiation (OAR). The National Park Service operates approximately 30 of the monitoring stations in cooperation with EPA.

NADP is a national long-term wet deposition network that measures precipitation chemistry and provides long-term geographic and temporal trends in concentration and deposition of precipitation components. Specifically, NADP provides measurements of sulfate and nitrate wet deposition at approximately 255 monitoring sites. EPA, along with several other Federal agencies, states, and private organizations, provide funding and support for NADP. The Illinois State Water Survey/University of Illinois maintains the NADP database.

The deposition monitoring networks have been in operation for over 25 years. They provide invaluable measurements on long-term trends and episodes in acid deposition; such data are essential for assessing progress toward the program's intended environmental outcomes. These networks need to be modernized to ensure the continued availability of these direct environmental measures. Maintaining a robust long-term atmospheric deposition monitoring network is critical for the accountability of the Acid Rain and Clean Air Interstate Rule (CAIR) Programs (and/or Clear Skies if new legislation is enacted).

The TIME project measures surface water chemistry and is based on the concept of a probability sample, where each site is chosen to be statistically representative of a target population. In the Northeast (New England and the Adirondacks), this target population consists of lakes likely to be responsive to changes in rates of acidic deposition (i.e., those with Gran ANC < 100 μeq/L). In the Mid-Atlantic, the target population is upland streams with a high probability of responding to changes in acidic deposition (i.e., Northern Appalachian Plateau streams with Gran ANC < 100 μeq/L). Each lake or stream is sampled annually (in summer for lakes, in spring for streams), and results are extrapolated to the target population. The most recent (2003) TIME trends analysis reported data from 43 Adirondack lakes, 30 New England lakes, and 31 Appalachian Plateau streams.

The TIME project goals are to determine not only how a representative sample of water bodies is changing through time, but also whether the proportion of the population that is acidic has changed. The project is operated cooperatively with numerous collaborators in state agencies, academic institutions and other federal agencies.

The LTM project complements TIME's statistical approach to sampling lakes and streams. LTM samples a subset of sensitive lakes and streams with long-term data, most dating back to the early 1980s. These sites are sampled 3 to 15 times per year. This information is used to characterize how the most sensitive aquatic systems in each region are responding to changing deposition, as well as providing information on seasonal chemistry and episodic acidification. In most regions, a small number of higher ANC (e.g., GranANC >100 μeq/L) sites are also sampled, and help separate temporal changes due to acidic deposition from those attributable to other disturbances such as changes in land use. The most recent (2003) LTM trends analysis reported data from 48 Adirondack lakes, 24 New England lakes, 9 Northern Appalachian Plateau streams, and 69 streams in the Blue Ridge region of Virginia and West Virginia. The project is operated cooperatively with numerous collaborators in state agencies, academic institutions and other federal agencies.

Methods, Assumption, and Suitability: Promulgated methods are used to aggregate emissions data across all United States' utilities for each pollutant and related source operating parameters such as heat input.

QA/QC Procedures: Promulgated QA/QC requirements dictate performing a series of quality assurance tests of CEMS performance. For these tests, emissions data are collected under highly structured, carefully designed testing conditions, which involve either high quality standard reference materials or multiple instruments performing simultaneous emission measurements. The resulting data are screened and analyzed using a battery of statistical procedures, including one that tests for systematic bias. If a CEM fails the bias test, indicating a potential for systematic underestimation of emissions, the source of the error must be identified and corrected or the data are adjusted to minimize the bias. Each affected plant is required to maintain a written QA plan documenting

performance of these procedures and tests. Further information is available at: http://www.epa.gov/airmarkets/reporting/index.html.

CASTNET established a Quality Assurance Project Plan (QAPP) in November 2001. The QAPP contains data quality objectives and quality control procedures for accuracy and precision. {U.S. EPA, Office of Air Quality Planning and Standards, *Clean Air Status and Trends Network (CASTNet) Quality Assurance Project Plan* (Research Triangle Park, NC: U.S. EPA, November 2001)}. In addition, the program publishes annual quality assurance reports. Both the CASTNET QAPP and 2003~~7~~ Annual Quality Assurance Report may be found at http://www.epa.gov/castnet/docs/annual_report_2007.pdf

NADP has established data quality objectives and quality control procedures for accuracy, precision and representation, available on the Internet: http://nadp.sws.uiuc.edu/QA/. The intended use of these data is to establish spatial and temporal trends in wet deposition and precipitation chemistry.

For TIME and LTM, the field protocols, laboratory methods, and quality assurance procedures are specific to each research group. QA/QC information is contained in the cited publications of each research group and compiled in Newell et al. (1987). The EMAP and TIME protocols and quality assurance methods are generally consistent with those of the LTM cooperators, and are detailed in Peck (1992) and in Table 3 of Stoddard, *et al* (2003).

Data Quality Review: The ETS provides instant feedback to sources on data reporting problems, format errors, and inconsistencies. The electronic data file QA checks are described at http://www.epa.gov/airmarkets/business/report-emissions.html All quarterly reports are analyzed to detect deficiencies and to identify reports that must be resubmitted to correct problems. EPA also identifies reports that were not submitted by the appropriate reporting deadline. Revised quarterly reports, with corrected deficiencies found during the data review process, must be obtained from sources by a specified deadline. All data are reviewed, and preliminary and final emissions data reports are prepared for public release and compliance determination.

CASTNET underwent formal peer review in 1997 by a panel of scientists from EPA and the National Oceanic Atmospheric Administration (NOAA). Findings are documented in *Examination of CASTNET: Data, Results, Costs, and Implications* (United States EPA, Office of Research and Development, National Exposure Research Laboratory, February 1997).

The NADP methods of determining wet deposition values have undergone extensive peer review; this process has been managed by NADP program office at the Illinois State Water Survey/University of Illinois. Assessments of changes in NADP methods are developed primarily through the academic community and reviewed through the technical literature process.

The TIME and LTM data used in EPA trends analysis reports are screened for internal consistency among variables, including ion balance and conductance balance. Samples with unexplained variation in these variables are deleted. Sites with mean Gran ANC greater than 200 μeq/L also are deleted. EPA trends analyses exclude sites with chloride values that are outliers in their region, because high Cl- is typically associated with human development in the watershed. The Cl- and associated Na+ would alter normal soil ion exchange relationships, thus obscuring the response to acidic deposition.

Data Limitations: In order to improve the spatial resolution of CASTNET, additional monitoring sites are needed, particularly in the middle of the country.

Error Estimate: None

New/Improved Data or Systems: The program plans to modernize and enhance CASTNET to ensure network viability and enhance the monitoring capacity to support ongoing and future accountability needs, particularly relating to long range pollutant transport.

References: For additional information about CASTNET, see http://www.epa.gov/castnet and for NADP, see http://nadp.sws.uiuc.edu/.

For a description of EPA's Acid Rain program, see http://www.epa.gov/acidrain/index.html and in the electronic Code of Federal Regulations at http://www.epa.gov/docs/epacfr40/chapt-I.info/subch-C.html (40 CFR parts 72-78.)

For TIME and LTM data quality and QA/QC procedures, see

Newell, A. D., C. F. Powers, and S. J. Christie. 1987. Analysis of Data from Long-term monitoring of Lakes. U.S. Environmental Protection Agency, Corvallis, OR.

Peck, D. V. 1992. Environmental Monitoring and Assessment Program: Integrated Quality Assurance Project Plan for the Surface Waters Resource Group. EPA/600/X-91/080, U.S. Environmental Protection Agency.

Stoddard, J. L., J. S. Kahl, F. A. Deviney, D. R. DeWalle, C. T. Driscoll, A. T. Herlihy, J. H. Kellogg, P. S. Murdoch, J. R. Webb, and K. E. Webster. 2003. Response of surface water chemistry to the Clean Air Act Amendments of 1990. EPA/620/R-03/001, U.S. Environmental Protection Agency, Corvallis, Oregon.

FY 2011Performance Measures:

- **Cumulative percent reduction in population-weighted ambient concentration of fine particulate matter (PM 2.5) in all monitored counties from 2003 baseline (program assessment measure)**
- **Cumulative percent reduction in population-weighted ambient concentration of ozone in monitored counties from 2003 baseline (program assessment measure)**

Performance Databases:

AQS —The Air Quality Subsystem (AQS) stores ambient air quality data used to evaluate an area's air quality levels relative to the NAAQS.

FREDS—The Findings and Required Elements Data System is used to track progress of states and Regions in reviewing and approving the required data elements of the State Implementation Plans (SIP). SIPs are clean air plans and define what actions a state will take to improve the air quality in areas that do not meet national ambient air quality standards

Data Sources:
AQS: State & local agency data from State and Local Air Monitoring Stations (SLAMS).

Population: Data from Census-Bureau/Department of Commerce

FREDS: Data are provided by EPA's Regional offices.

Methods, Assumptions, and Suitability: Design values are calculated for every county with adequate monitoring data (for more information on and a definition for design values, see www.epa.gov/ttn/oarpg/t1/memoranda/cdv.pdf). Air quality levels are evaluated relative to the baseline level and the design value. The change in air quality concentrations is then multiplied by the number of people living in the county. This analysis assumes that the populations of the areas are held constant at 2000 Census levels. Data comparisons over several years allow assessment of the air program's success.

QA/QC Procedures: AQS: The QA/QC of the national air monitoring program has several major components: the Data Quality Objective (DQO) process, reference and equivalent methods program, EPA's National Performance Audit Program (NPAP), system audits, and network reviews (Available on the Internet: www.epa.gov/ttn/amtic/npaplist.html). To ensure quality data, the SLAMS are required to meet the following: 1) each site must meet network design and site criteria; 2) each site must provide adequate QA assessment, control, and corrective action functions according to minimum program requirements; 3) all sampling methods and equipment must meet EPA reference or equivalent requirements; 4) acceptable data validation and record

keeping procedures must be followed; and 5) data from SLAMS must be summarized and reported annually to EPA. Finally, there are system audits that regularly review the overall air quality data collection activity for any needed changes or corrections. Further information available on the Internet: http://www.epa.gov/cludygxb/programs/namslam.html and through United States EPA's Quality Assurance Handbook (EPA-454/R-98-004 Section 15)

Populations: No additional QA/QC beyond that done by the Census Bureau/Department of Commerce.

FREDS: No formal QA/QC procedures.

Data Quality Review:

AQS: No external audits have been done in the last 3 years. However, internal audits are regularly conducted.

Populations: No additional QA/QC beyond that done by the Census Bureau/Department of Commerce.

FREDS: None

Data Limitations:

AQS: None known

Populations: Not known

FREDS: None known

Error Estimate: At this time it is not possible to develop an error estimate. There is still too much uncertainty in the projections and near term variations in air quality (due to meteorological conditions, for example).

New/Improved Data or Systems:

AQS: In January 2002, EPA completed the reengineering of AQS to make it a more user friendly, Windows-based system. As a result, air quality data are more easily accessible via the Internet. AQS has also been enhanced to comply with the Agency's data standards (*e.g.*, latitude/longitude, chemical nomenclature). Beginning in July 2003, agencies submitted air quality data to AQS thru the Agency's Central Data Exchange (CDX). CDX is intended to be the portal through which all environmental data coming to or leaving the Agency will pass.

Population: None

FREDS: None

References: For additional information about criteria pollutant data, non-attainment areas, and other related information, see: http://www.epa.gov/airtrends/.

FY 2011 Performance Measure:

- **Cumulative percent reduction in the number of days to process SIP revisions weighted by complexity (program assessment efficiency measure)**

Performance Databases: None

Data Sources: Data are provided by EPA's regional offices.

Methods, Assumptions, and Suitability: Baseline for processing SIP revisions is 420 days (The Clean Air Act (CAA) provides 60 days for completeness + 360 days for technical review)

Each Region will maintain a SIP tracking system. It will include the date of receipt, interim dates and the final Regional Administrator's signature for each SIP submission. At the end of the fiscal year, each Region will sum the total allowable SIP processing days and the total actual SIP processing days for SIP revisions processed to final action during the fiscal year. Each Region will then submit the totals to the National SIP processing work group chair who will then divide the total actual processing days by the total allowable processing days and calculate the percent difference from base year processing time.

The SIP revisions are weighted by complexity because it takes some areas longer than others to reach attainment.

QA/QC Procedures: EPA regional staff ensure the number of SIP revisions finalized is equal to or less than the total number of SIP revisions received.

Data Quality Review: Same as QA/QC procedures

Data Limitations: None known

Error Estimate: There is no estimate on the number of errors that could have been made during data entry.

New/Improved Data or Systems: None

References: None.

FY 2011 Performance Measures:

- **Cumulative percent reduction in the average number of days during the ozone season that the ozone standard is exceeded in baseline non-**

attainment areas, weighted by population. (program assessment measure)

- **Cumulative percent reduction in the number of days with Air Quality Index (AQI) values over 100 since 2003, weighted by population and AQI value. (program assessment measure)**
- **Cumulative percent reduction in the number of days with Air Quality Index (AQI) values over 100 since 2003, per grant dollar allocated to the States in support of the NAAQS program. (program assessment efficiency measure)**

Performance Databases:

AQS —The Air Quality Subsystem (AQS) stores ambient air quality data used to evaluate an area's air quality levels relative to the NAAQS.

AIRNow DMC –The AIRNow Data Management System (DMC) stores real-time ambient air quality data used for the sole purpose of reporting real-time AQI and air quality forecasting.

Data Sources:

AQS/DMC: State & local agency data from State and Local Air Monitoring Stations (SLAMS) and National Air Monitoring Stations (NAMS). Program dollars are based on the grant dollars allocated to the States in support of the NAAQS program, which will be retrieved from the EPA Financial Data Warehouse.

Methods, Assumptions, and Suitability:

Data are gathered from monitors using EPA-approved federal reference and/or equivalent methods, all of which are published via the Federal Register. EPA assumes the collecting agency has properly maintained each monitor and that the data sent to EPA have passed at least an automated QA/QC check. The monitoring networks have been providing data for decades and the data are considered highly reliable. In addition these data form the basis of EPA's attainment decisions, trend analysis, and health impact assessments.

QA/QC Procedures:

AQS: The QA/QC of the national air monitoring program has several major components: the Data Quality Objective (DQO) process, reference and equivalent methods program, EPA's National Performance Audit Program (NPAP), system audits, and network reviews (Available on the Internet: www.epa.gov/ttn/amtic/npaplist.html). To ensure quality data, the SLAMS are required to meet the following: 1) each site must meet network design and site criteria; 2) each site must provide adequate QA assessment, control, and corrective action functions according to minimum program requirements; 3) all sampling methods and equipment must meet EPA reference or equivalent

requirements; 4) acceptable data validation and record keeping procedures must be followed; and 5) data from SLAMS must be summarized and reported annually to EPA. Finally, there are system audits that regularly review the overall air quality data collection activity for any needed changes or corrections. Further information available on the Internet: http://www.epa.gov/cludygxb/programs/namslam.html and through United States EPA's Quality Assurance Handbook (EPA-454/R-98-004 Section 15)

DMC: The QA/QC procedures at each State, local, Tribal, or Federal agency are the same as documented above. Because the DMC handles real-time data, additional QA/QC data checks are built into the data flow process to further guard against erroneous values being passed through the system. Data in the DMC are not considered final and are not used for any regulatory purpose. Data in the AQS system are the official values used for regulatory analyses.

Data Quality Review:

AQS: No external audits have been done in the last 3 years. However, internal audits are regularly conducted.

DMC: No external audits have been done in the last 3 years. However, internal audits are regularly conducted and data are routinely processed by external users where applicable.

Data Limitations:

AQS: None known

DMC: None known

Error Estimate: At this time it is not possible to develop an error estimate. There is still too much uncertainty in the projections and near term variations in air quality (due to meteorological conditions for example).

New/Improved Data or Systems:

AQS: In January 2002, EPA completed the reengineering of AQS to make it a more user friendly, Windows-based system. As a result, air quality data are more easily accessible via the Internet. AQS has also been enhanced to comply with the Agency's data standards (*e.g.*, latitude/longitude, chemical nomenclature). Beginning in July 2003, agencies submitted air quality data to AQS thru the Agency's Central Data Exchange (CDX). CDX is intended to be the portal through which all environmental data coming to or leaving the Agency will pass.

DMC: AIRNow Data Management Center was redesigned in 2004 to more efficiently handle additional pollutants and provide for easier access to real-time data. In addition,

automated QA/QC procedures were updated and increased flexibility for state/local agencies to update information was included.

References: For additional information about criteria pollutant data, non-attainment areas, and other related information, see: http://www.epa.gov/airtrends/. For more information on the monitoring network, as well as reference and equivalent methods, see the Ambient Monitoring Technology Information Center (AMTIC) at: http://www.epa.gov/ttn/amtic . For information on the AIRNow real-time program, see: http://www.airnow.gov/.

FY 2011 Performance Measures:

- **Percent of significant Title V operating permit revisions issued within 18 months of receiving a complete permit application. (program assessment measure)**
- **Percent of new Title V operating permits issued within 18 months of receiving a complete permit application. (program assessment measure)**

Performance Databases: TOPS (Title V Operating Permit System).

Data Sources: Permitting Agencies (State and Local) via EPA Regional Offices

Methods, Assumptions, and Suitability: The performance measure is calculated by comparing the number of new permits or significant permit modifications issued during past 18 months to the total number of new permits or significant permit modifications received during the same period. Data are collected every 6 months. There are no underlying assumptions in the development of this measure.

QA/QC Procedures: Some data quality checks include: 1) making sure the number of permits issued in 18 months is equal to or less than the total number of permits received. 2) ensuring the percentages seem reasonable compared to previous reporting periods, and 3) making sure clock does not restart when additional information is submitted after the application is received.

Data Quality Review: Same as QA procedures

Data Limitations: None

Error Estimate: There is no estimate on the number of errors that could have been made during data entry.

New/Improved Data or Systems: TOPS has been revised and improved for 2006 to ensure better consistency between states and to specifically track program assessment measures.

References: For additional information about criteria pollutant data, non-attainment areas, and other related information, see: http://www.epa.gov/airtrends/.

FY 2011 Performance Measure:

- **Percent of major NSR permits issued within one year of receiving a complete permit application. (program assessment measure)**

Performance Databases: RBLC (RACT (Reasonably Available Control Technology) BACT (Best Available Control Technology) LAER (Lowest Achievable Emissions Rate) Clearinghouse)

Data Sources: Permitting Agencies (State and Local)

Methods, Assumptions, and Suitability: The performance measure is calculated by determining the time period between the date of complete permit application and permit issuance. The percentage represents the number of major NSR permits issued within one year of complete application to the total number of permits issued within that same period. There are no underlying assumptions in the development of this performance measure.

QA/QC Procedures: Some data quality checks include: 1) making sure the permit issuance dates are after the complete permit application dates and appear reasonable, 2) ensuring the permit processing times are similar for comparable permits in previous reporting periods and 3) making sure the time period does not restart when additional information is submitted after the application is received.

Data Quality Review: Same as QA procedures

Data Limitations: None

Error Estimate: There is no estimate on the number of errors that could have been made during data entry.

New/Improved Data or Systems: N/A

References: For additional information about criteria pollutant data, non-attainment areas, and other related information, see: http://www.epa.gov/airtrends/.

FY 2011 Performance Measures:

- **Millions of tons of volatile organic compounds (VOCs) reduced since 2000 from mobile sources. (program assessment measure)**
- **Millions of tons of nitrogen oxide (NOx) reduced since 2000 from mobile sources. (program assessment measure)**
- **Tons of particular matter (PM 10) reduced since 2000 from mobile sources (program assessment measure)**

- **Tons of particular matter (PM 2.5) reduced since 2000 from mobile sources (program assessment measure)**
- **Limit the increase of CO Emissions (in tons) from mobile sources (program assessment measure)**

Performance Database: National Emissions Inventory Database. See: http://www.epa.gov/ttn/chief/trends/

Data Source: Mobile source emissions inventories and Regulatory Impact Analyses

Estimates for on-road, off-road mobile source emissions are built from inventories fed into the relevant models, which in turn provide input to the National Emissions Inventory Database.

The MOBILE vehicle emission factor model is a software tool for predicting gram per mile emissions of hydrocarbons, carbon monoxide, oxides of nitrogen, carbon dioxide, particulate matter, and toxics from cars, trucks, and motorcycles under various conditions. Inputs to the model include fleet composition, activity, temporal information, and control program characteristics.

The NONROAD emission inventory model is a software tool for predicting emissions of hydrocarbons, carbon monoxide, oxides of nitrogen, particulate matter, and sulfur dioxides from small and large off road vehicles, equipment, and engines. Inputs to the model include fleet composition, activity and temporal information.

Certain mobile source information is updated annually. Inputs are updated annually only if there is a rationale and readily available source of annual data. Generally, Vehicle Miles Traveled (VMT), the mix of VMT by type of vehicle (Federal Highway Administration (FHWA)-types), temperature, gasoline properties, and the designs of Inspection/Maintenance (I/M) programs are updated each year. Emission factors for all mobile sources and activity estimates for non-road sources are changed only when the Office of Transportation and Air Quality requests that this be done and is able to provide the new information in a timely manner. The most recent models for mobile sources are MOBILE6 and Nonroad 2002. (Available on the Internet at http://www.epa.gov/otaq/models.htm.) The inputs to these and other models will be reviewed and updated, sometimes on an annual basis for some parameters. Unless the model inputs are updated and recalculations done for the performance measures to obtain updated numbers, the actual numbers will be the same as the projected numbers.

Major EPA regulatory packages always include detailed Regulatory Impact Analysis which estimates the costs industry is projected to accrue in meeting EPA regulations. These cost estimates will form the basis of the numbers in the EPA performance measures. Also, costs for the EPA mobile source program (including personnel costs) will be included also. Estimates will be made for various years for tons/dollar for pollutants (the total of HC, CO, NOx, and PM) removed.

Methods, Assumptions, and Suitability: EPA issues emissions standards that set limits on how much pollution can be emitted from a given mobile source. Mobile sources include vehicles that operate on roads and highways ("on road" or "highway" vehicles), as well as nonroad vehicles, engines, and equipment. Examples of mobile sources are cars, trucks, buses, earthmoving equipment, lawn and garden power tools, ships, railroad locomotives, and airplanes. Vehicle and equipment manufacturers have responded to many mobile source emission standards by redesigning vehicles and engines to reduce pollution.

EPA uses models to estimate mobile source emissions, for both past and future years. The estimates are used in a variety of different settings. The estimates are used for rulemaking.

The most complete and systematic process for making and recording such mobile source emissions is the "Trends" inventory process executed each year by the Office of Air Quality Planning and Standards' (OAQPS) Emissions, Monitoring, and Analysis Division (EMAD). The Assessment and Standards Division, within the Office of Transportation and Air Quality, provides EMAD information and methods for making the mobile source estimates. In addition, EMAD's contractors obtain necessary information directly from other sources; for example, weather data and the Federal Highway Administration's (FHWA) Vehicle Miles Traveled (VMT) estimates by state. EMAD creates and publishes the emission inventory estimate for the most recent historical year, detailed down to the county level and with over 30 line items representing mobile sources. At irregular intervals as required for regulatory analysis projects, EMAD creates estimates of emissions for future years. When the method for estimating emissions changes significantly, EMAD usually revises its older estimates of emissions in years prior to the most recent year, to avoid a sudden discontinuity in the apparent emissions trend. EMAD publishes the national emission estimates in hardcopy; county-level estimates are available electronically. Additional information about transportation and air quality related to estimating, testing for, and measuring emissions, as well as research being conducted on technologies for reducing emissions is available at http://www.epa.gov/otaq/research.htm

When major changes are made in the emission models or resulting inventories (and even the cost estimates), the performance measures will be reviewed to determine if they should be updated.

QA/QC Procedures: The emissions inventories are continuously improved.

Data Quality Review: The emissions inventories are reviewed by both internal and external parties, including the states, locals and industries.

Data Limitations: The limitations of the inventory estimates for mobile sources come from limitations in the modeled emission factors (based on emission factor testing and models predicting overall fleet emission factors in g/mile) and also in the estimated vehicle miles traveled for each vehicle class (derived from Department of Transportation

data).http://www.epa.gov/otaq/m6.htm. For nonroad emissions, the estimates come from a model using equipment populations, emission factors per hour or unit of work, and an estimate of usage. This nonroad emissions model accounts for over 200 types of nonroad equipment. Any limitations in the input data will carry over into limitations in the emission inventory estimates.

Error Estimate: Additional information about data integrity is available on the Internet: http://www.epa.gov/otaq/m6.htm.

New/Improved Data or Systems: To keep pace with new analysis needs, new modeling approaches, and new data, EPA is currently working on a new modeling system termed the Multi-scale Motor Vehicles and Equipment Emission System (MOVES). This new system will estimate emissions for on road and off road sources, cover a broad range of pollutants, and allow multiple scale analysis, from fine scale analysis to national inventory estimation. When fully implemented, MOVES will serve as the replacement for MOBILE6 and NONROAD. The new system will not necessarily be a single piece of software, but instead will encompass the necessary tools, algorithms, underlying data and guidance necessary for use in all official analyses associated with regulatory development, compliance with statutory requirements, and national/regional inventory projections. Additional information is available on the Internet: http://www.epa.gov/otaq/ngm.htm

References: For additional information about mobile source programs see: http://www.epa.gov/otaq/.

FY 2011 Performance Measures:

- **Cumulative percentage reduction in tons of toxicity-weighted (for cancer risk) emissions of air toxics from 1993 baseline (program assessment measure)**
- **Cumulative percentage reduction in tons of toxicity-weighted (for noncancer risk) emissions of air toxics from 1993 baseline (program assessment measure)**

Performance Databases:

- National Emissions Inventory (NEI) for Hazardous Air Pollutants (HAPs)
- EPA's Health Criteria Data for Risk Characterization

Data Source:

To better measure the percentage change in cancer and noncancer risk to the public, a toxicity-weighted emission inventory performance measure has been developed. This measure utilizes data from the NEI for air toxics along with data from EPA's Health Criteria Data for Risk Characterization (found at www.epa.gov/ttn/atw/toxsource/summary.html), which is a compendium of cancer and noncancer health risk criteria used to develop a risk metric. This compendium includes tabulated values for long-term (chronic) inhalation for many of the 188 hazardous air pollutants. These health risk data were obtained from various data sources including EPA, the U.S. Agency for Toxic Substances and Disease Registry, California

Environmental Protection Agency, and the International Agency for Research on Cancer. The numbers from the health risk database are used for estimating the risk of contracting cancer and the level of hazard associated with adverse health effects other than cancer.

The NEI for HAPs includes emissions from large and small industrial sources inventoried as point sources, smaller stationary area and other sources, such as fires inventoried as non-point sources, and mobile sources. Prior to 1999 NEI for HAPs, there was the National Toxics Inventory (NTI). The baseline NTI (for base years 1990 - 1993) includes emissions information for 188 hazardous air pollutants from more than 900 stationary sources and from mobile sources. It is based on data collected during the development of Maximum Achievable Control Technology (MACT) standards, state and local data, Toxics Release Inventory (TRI) data, and emissions estimates using accepted emission inventory methodologies. The baseline NTI contains county level emissions data and cannot be used for modeling because it does not contain facility specific data.

The 2002 NEI and a slightly modified/updated 2005 NEI for HAPs contain stationary and mobile source estimates. These inventories also contain estimates of facility-specific HAP emissions and their source specific parameters such as location (latitude and longitude) and facility characteristics (stack height, exit velocity, temperature, etc.

The primary source of data in the 1996 and 1999 inventories are state and local air pollution control agencies and Tribes. These data vary in completeness, format, and quality. EPA evaluates these data and supplements them with data gathered while developing MACT and residual risk standards, industry data, and TRI data.

For more information and references on the development of the 1996 NTI, please go to the following web site: www.epa.gov/ttn/chief/nti/index.html#nti. For more information and references on the development of the 1999 NEI for HAPs, please go to the following web site: www.epa.gov/ttn/chief/net/index.html#1999.

Methods, Assumptions and Suitability: As the NEI is only developed every three years, EPA utilizes an emissions modeling system to project inventories for "off-years" and to project the inventory into the future. This model, the EMS-HAP (Emissions Modeling System for Hazardous Air Pollutants), can project future emissions, by adjusting stationary source emission data to account for growth and emission reductions resulting from emission reduction scenarios such as the implementation of the Maximum Achievable Control Technology (MACT) standards.

Once the EMS-HAP process has been performed, the EPA would tox-weight the inventory by "weighting" the emissions for each pollutant with the appropriate health risk criteria. This would be accomplished through a multi-step process. Initially, pollutant by pollutant values would be obtained from the NEI for the current year and the baseline year (1990/93). Conversion of actual tons for each pollutant for the current year and the baseline year to "toxicity-weighted" tons would be accomplished by multiplying the appropriate values from the health criteria database such as the unit risk estimate (URE) or lifetime cancer risk (defined at http://www.epa.gov/ttn/atw/toxsource/summary.html)

to get the noncancer tons. These toxicity-weighted values act as a surrogate for risk and allow EPA to compare the toxicity-weighted values against a 1990/1993 baseline of toxicity-weighted values to determine the percentage reduction in risk on an annual basis

Complete documentation on development of the NEI for HAPs can be found at http://www.epa.gov/ttn/chief/net/index.html. For more information and references on EMS-HAP, go to the following web sites: http://www.epa.gov/scram001/tt22.htm#aspen and http://www.epa.gov/ttn/chief/emch/projection/emshap.html. The growth and reduction information used for the projections are further described at http://www.epa.gov/ttn/chief/emch/projection/emshap.html

QA/QC Procedures: The NTI and the NEI for HAPs are databases designed to house information from other primary sources. The EPA performs extensive quality assurance/quality control (QA/QC) activities, including checking data provided by other organizations, to improve the quality of the emission inventory. Some of these activities include: (1) the use of an automated format QC tool to identify potential errors of data integrity, code values, and range checks; (2) use of geographical information system (GIS) tools to verify facility locations; and (3) automated content analysis by pollutant, source category and facility to identify potential problems with emission estimates such as outliers, duplicate sites, duplicate emissions, coverage of a source category, etc. The content analysis includes a variety of comparative and statistical analyses. The comparative analyses help reviewers prioritize which source categories and pollutants to review in more detail based on comparisons using current inventory data and prior inventories. The statistical analyses help reviewers identify potential outliers by providing the minimum, maximum, average, standard deviation, and selected percentile values based on current data. The EPA has incorporated an automated AAQA content tool into its data submission process. Information on emission inventory reporting (including a QA check) can be found at: http://www.epa.gov/ttn/chief/net/neip/index.html

The NTI database contains data fields that indicate if a field has been augmented and identifies the augmentation method. After performing the content analysis, the EPA contacts data providers to reconcile potential errors. The draft NTI is posted for external review and includes a README file, with instructions on review of data and submission of revisions, state-by-state modeling files with all modeled data fields, and summary files to assist in the review of the data. One of the summary files includes a comparison of point source data submitted by different organizations. During the external review of the data, state and local agencies, Tribes, and industry provide external QA of the inventory. The EPA evaluates proposed revisions from external reviewers and prepares memos for individual reviewers documenting incorporation of revisions and explanations if revisions were not incorporated. All revisions are tracked in the database with the source of original data and sources of subsequent revision.

The external QA and the internal QC of the inventory have resulted in significant changes in the initial emission estimates, as seen by comparison of the initial draft NEI for HAPs and its final version. For more information on QA/QC of the NEI for HAPs, please refer to the following web site for a paper presented at the 2002 Emission Inventory

Conference in Atlanta. "QA/QC - An Integral Step in the Development of the 1999 National Emission Inventory for HAPs", Anne Pope, et al. www.epa.gov/ttn/chief/conference/ei11/qa/pope.pdf

EPA's Office of Environmental Information (OEI) has created uniform data standards or elements, which provide "meta" information on the standard NEI Input Format (NIF) fields. These standards were developed by teams representing states, Tribes, EPA and other Federal agencies. The use of common data standards among partners fosters consistently defined and formatted data elements and sets of data values, and provides public access to more meaningful data. The standards relevant to the NEI for HAPs are the: SIC/NAICS, Latitude/Longitude, Chemical Identification, Facility Identification, Date, Tribal and Contact Data Standards. The 1999 NEI for HAPs is compliant with all new data standards except the Facility Identification Standard because OEI has not completed its assignment of Facility IDs to the 1999 NEI for HAPs facilities.

For more information on compliance of the NEI for HAPs with new OMB Information Quality Guidelines and new EPA data standards, please refer to the following web site for a paper presented at the 2003 Emission Inventory Conference in San Diego. "The Challenge of Meeting New EPA Data Standards and Information Quality Guidelines in the Development of the 2002 NEI Point Source Data for HAPs", Anne Pope, et al. www.epa.gov/ttn/chief/conference/ei12/dm/pope.pdf. The 2002 NEI for HAPs will undergo scientific peer review in early 2005.

The tables used in the EPA's Health Criteria Data for Risk Characterization (found at www.epa.gov/ttn/atw/toxsource/summary.html) are compiled assessments from various sources for many of the 188 substances listed as hazardous air pollutants under the Clean Air Act of 1990. Because different sources developed these assessments at different times for purposes that were similar but not identical, results are not totally consistent. To resolve these discrepancies and ensure the validity of the data, EPA applied a consistent priority scheme consistent with EPA risk assessment guidelines and various levels of scientific peer review. These risk assessment guidelines can be found at http://www.epa.gov/risk/guidance.htm.

Data Quality Review: EPA staff, state and local agencies, Tribes, industry and the public review the NTI and the NEI for HAPs. To assist in the review of the 1999 NEI for HAPs, the EPA provided a comparison of data from the three data sources (MACT/residual risk data, TRI, and state, local and Tribal inventories) for each facility. For the 1999 NEI for HAPs, two periods were available for external review - October 2001 - February 2002 and October 2002 - March 2003. The final 1999 NEI was completed and posted on the Agency website in the fall of 2003. Beginning in 2005, the NTI will undergo an external scientific peer review.

The EMS-HAP has been subjected to the scrutiny of leading scientists throughout the country in a process called "scientific peer review". This ensures that EPA uses the best available scientific methods and information. In 2001, EPA's Science Advisory Board (SAB) reviewed the EMS-HAP model as part of the 1996 national-scale assessment. The

review was generally supportive of the assessment purpose, methods, and presentation; the committee considers this an important step toward a better understanding of air toxics. Additional information is available on the Internet: www.epa.gov/ttn/atw/nata/peer.html.

The data compiled in the Health Criteria Data for Risk Characterization (found at www.epa.gov/ttn/atw/toxsource/summary.html) are reviewed to make sure they support hazard identification and dose-response assessment for chronic exposures as defined in the National Academy of Sciences (NAS) risk assessment paradigm (www.epa.gov/ttn/atw/toxsource/paradigm.html). Because the health criteria data were obtained from various sources they are prioritized for use (in developing the performance measure, for example) according to 1) conceptual consistency with EPA risk assessment guidelines and 2) various levels of scientific peer review. The prioritization process is aimed at incorporating the best available scientific data.

Data Limitations and Error Estimates: While emissions estimating techniques have improved over the years, broad assumptions about the behavior of sources and serious data limitations still exist. The NTI and the NEI for HAPs contain data from other primary references. Because of the different data sources, not all information in the NTI and the NEI for HAPs has been developed using identical methods. Also, for the same reason, there are likely some geographic areas with more detail and accuracy than others. Because of the lesser level of detail in the baseline NTI, it is currently not suitable for input to dispersion models. For further discussion of the data limitations and the error estimates in the 1999 NEI for HAPs, please refer to the discussion of Information Quality Guidelines in the documentation at:
www.epa.gov/ttn/chief/net/index.html#haps99 .

In 2004, the Office of the Inspector General (OIG) released a final evaluation report on "EPA's Method for Calculating Air Toxics Emissions for Reporting Results Needs Improvement" (report can be found at www.epa.gov/oig/reports/2004/20040331-2004-p-00012.pdf). The report stated that although the methods used have improved substantially, unvalidated assumptions and other limitations underlying the NTI continue to impact its use as a GPRA performance measure. As a result of this evaluation and the OIG recommendations for improvement, EPA prepared an action plan and is looking at ways to improve the accuracy and reliability of the data. EPA will meet bi-annually with OIG to report on its progress in completing the activities as outlined in the action plan.

While the Agency has made every effort to utilize the best available science in selecting appropriate health criteria data for toxicity-weighting calculations there are inherent limitations and errors (uncertainties) associated with this type of data. While it is not practical to expose humans to chemicals at target doses and observe subsequent health implications over long periods of time, most of the agencies health criteria is derived from response models and laboratory experiments involving animals. The parameter used to convert from exposure to cancer risk (i.e. the Unit Risk Estimate or URE) is based on default science policy processes used routinely in EPA assessments. First, some air toxics are known to be carcinogens in animals but lack data in humans. These have

been assumed to be human carcinogens. Second, all the air toxics in this assessment were assumed to have linear relationships between exposure and the probability of cancer (i.e. effects at low exposures were extrapolated from higher, measurable, exposures by a straight line). Third, the URE used for some air toxics compounds represents a maximum likelihood estimate, which might be taken to mean the best scientific estimate. For other air toxics compounds, however, the URE used was an "upper bound" estimate, meaning that it probably leads to an overestimation of risk if it is incorrect. For these upper bound estimates, it is assumed that the URE continues to apply even at low exposures. It is likely, therefore, that this linear model over-predicts the risk at exposures encountered in the environment. The cancer weighting-values for this approach should be considered "upper bound" in the science policy sense.

All of the noncancer risk estimates have a built-in margin of safety. All of the Reference Concentrations (RfCs) used in toxicity-weighting of noncancer are conservative, meaning that they represent exposures which probably do not result in any health effects, with a margin of safety built into the RfC to account for sources of uncertainty and variability. Like the URE used in cancer weighting the values are, therefore, considered "upper bound" in the science policy sense. Further details on limitations and uncertainties associated with the agencies health data can be found at: www.epa.gov/ttn/atw/nata/roy/page9.html#L10

New/Improved Data or Systems: The 1996 NTI and 1999 NEI for HAPs are a significant improvement over the baseline NTI because of the added facility-level detail (e.g., stack heights, latitude/longitude locations), making it more useful for dispersion model input. Future inventories (2002 and later years) are expected to improve significantly because of increased interest in the NEI for HAPs by regulatory agencies, environmental interests, and industry, and the greater potential for modeling and trend analysis. During the development of the 1999 NEI for HAPs, all primary data submitters and reviewers were required to submit their data and revisions to EPA in a standardized format using the Agency's Central Data Exchange (CDX). For more information on CDX, please go the following web site: www.epa.gov/ttn/chief/nif/cdx.html

Beginning in 2006, the toxicity-weighted emission inventory data will also be used as a measurement to predict exposure and risk to the public. This measure will utilize ambient monitoring of air toxics as a surrogate for population exposure and compare these values with health benchmarks to predict risks.

References:

The NTI and NEI data and documentation are available at the following sites:

Emissions Inventory Data:	ftp://ftp.epa.gov/EmisInventory/
Available inventories:	1996 NTI, 1999 NEI for HAPs
Contents:	Modeling data files for each state
	Summary data files for nation
	Documentation

	README file
Audience:	individuals who want full access to NTI files

NEON:	http://ttnwww.rtpnc.epa.gov/Neon/
Available inventories:	1996 NTI and 1999 NEI for HAPs
Contents:	Summary data files
Audience:	EPA staff

CHIEF:	www.epa.gov/ttn/chief
	1999 NEI for HAPs data development materials
	1999 Data Incorporation Plan - describes how EPA compiled the 1999 NEI for HAPs
	QC tool for data submitters
	Data Augmentation Memo describes procedures EPA will use to augment data
	99 NTI Q's and A's provides answers to frequently asked questions
	NIF (Input Format) files and descriptions
	CDX Data Submittal Procedures - instructions on how to submit data using CDX
	Training materials on development of HAP emission inventories
	Emission factor documents, databases, and models
Audience:	State/local/Tribal agencies, industry, EPA, and the public

Information on the Emissions Modeling System for Hazardous Air Pollutants:

EMS-HAP:	http://www.epa.gov/scram001/userg/other/emshapv3ug.pdf
	http://www.epa.gov/ttn/chief/emch/projection/emshap.html
Contents:	1996 NTI and 1999 NEI for HAPs
Audience:	public

Information on EPA's Health Criteria Data for Risk Characterization:

Health Criteria Data:	http://www.epa.gov/ttn/atw/toxsource/summary.html
Contents:	Tabulated dose response values for long-term (chronic) inhalation and oral exposures; and values for short-term (acute) inhalation exposure
Audience:	public

GOAL 1 OBJECTIVE 2

<u>FY 2011 Performance Measure</u>:

- **Number of additional homes (new and existing) with radon reducing features (program assessment measure)**

Performance Database: Annual industry survey data of home builders provided by the National Association of Home Builders and an internal database of fan sales.

Data Sources: The data for new homes is from a survey, which is an annual sample of home builders in the United States, most of whom are members of the National Association of Home Builders (NAHB). NAHB members construct 80% of the homes built in the United States each year. Using a survey methodology reviewed by EPA, NAHB Research Center estimates the percentage of these homes that are built with radon-reducing features. The percentage built with radon-reducing features from the sample is then used to estimate what percent of all homes built nationwide include these features, and of a subset built in high radon potential areas (Zone 1 on EPA's Radon Zone Map) which are radon resistant**.**

The data source for existing homes is the radon fan manufacturers who report fan sales to the Agency. EPA makes a number of assumptions about how the fans are used, e.g.,assumes one fan per radon mitigated home, and a fan life of (10 years), and then calculates the assumed estimated number of homes that have been mitigated that year, and the cumulative total adjusted for fan life.

Methods, Assumptions, and Suitability: EPA collects data annually on the number of new homes built with radon-resistant reducing features based on annual surveys of homebuilding practices conducted by the NAHB Research Center. EPA collects data annually on the number of existing homes mitigated for elevated radon levels based on radon mitigation fan sales data obtained through voluntary reporting by the fan manufacturers. Radon mitigation fans have an estimated average life of ten years. When estimating the number of new radon mitigations annually in existing homes, the data from fan manufacturers is adjusted based on an assumption that previously-installed radon mitigation systems will have their fans replaced once every ten years. The data are suitable for year-to-year comparisons.

This annual measure is a combination of data that includes additional number of homes built with radon resistant new construction (RRNC), reported by industry on an annual basis, as well as additional radon mitigations which are estimated from annual radon fan sales.

QA/QC Procedures: Because the data are obtained from an external organization, their, QA/QC procedures are not entirely known. According to NAHB Research Center,

QA/QC procedures have been established, which include QA/QC by the vendor that is utilized for key entry of data. Because fan sales data, are obtained from an external organization, EPA relies on the business practices of radon fan manufacturers for reporting the data.

Data Quality Review: NAHB Research Center indicates that each survey is manually reviewed, a process that requires several months to complete. The review includes data quality checks to ensure that the respondents understood the survey questions and answered the questions appropriately. NAHB Research Center also applies checks for open-ended questions to verify the appropriateness of the answers. Also, a quality review of each year's draft report is conducted by the EPA project officer. Fan sales data are obtained from an external organizations and EPA reviews the data to ascertain their derivation and reliability, and resolves any irregularities with the relevant manufacturer.

Data Limitations: The majority of home builders surveyed are NAHB members. To augment the survey sample size, the NAHB Research Center sends the survey to home builders identified from mailing lists of builder trade publications, such as Professional Builder magazine. There is some uncertainty as to whether the survey adequately characterizes the practices of builders who are not members of NAHB. The effects on the findings are not known.

The survey typically has an overall response rate of 5 percent, while relatively low, is the response rate for the entire survey. The radon-reducing features, new construction questions are only a very small portion of the overall survey. Builders responding to the survey would not be doing so principally due to their radon activities. Thus, a low response rate does not necessarily indicate a strong potential for a positive bias under the speculation that builders using radon-resistant construction would be more likely to respond to the survey.

Reporting by radon fan manufacturers is voluntary and may underestimate the number of radon fans sold. Nevertheless, these are the best available data to determine the number of homes mitigated nationally. There are other non-fan methods not captured by the fan sales data to mitigate radon including: (1) passive mitigation techniques of sealing holes and cracks in floors and foundation walls; (2) installing sealed covers over sump pits; (3) installing one-way drain valves in untrapped drains; and (4) installing static venting and ground covers in areas like crawl spaces. Because there are no data on the occurrence of these methods, there is again the possibility that the number of radon mitigated homes has been underestimated.

No radon vent fan manufacturer, vent fan motor maker or distributor is required to report to EPA; they provide data/information voluntarily to EPA. There are only three 3 radon vent fan manufacturers of any significance; one of these accounts for an estimated the majority (about 70%) of the market. Radon vent fans are unlikely to be used for non-radon applications. However, vent fans typically used for non-radon applications are perhaps being used as substitutes for radon vent fans in some instances; estimated to be less than 1% of the total market. Ascertaining the actual number of radon vent fans used

for other applications, and the number of non-radon fans being substituted in radon applications, would be difficult and expensive at this time relative to the benefit of having such data.

Error Estimate: The statistical estimates of the NAHB survey are typically reported with a 95 percent confidence interval.

New/Improved Data or Systems: None

References: The results are published by the NAHB Research Center in annual reports of radon-resistant home building practices. See http://www.nahbrc.org/ for more information about NAHB. The most recent report, "Builder Practices Report: Radon Resistant Construction Practices in New US Homes 2007." in New Construction 2003,"Annual Builder and Consumer Practices Surveys by the NAHB Research Center, Inc., September 2008. Similar report titles exist for prior years.

See http://www.epa.gov/iaq/radon/pubs/index.html for National performance/progress reporting (National Radon Results: 1985-to 2003) on radon, measurement, mitigation and radon-resistant new construction.

FY 2011 Performance Measures:

- **Expressed as a percentage, the cumulative number of existing homes with an operating mitigation system (HOMS)) compared to the estimated number of homes at or above EPA's 4pCi/L* action level**
- **Total number of all new single family homes (SFH) built in high radon potential areas (zone 1) compared to new homes in zone 1 built with mitigation-ready systems (radon-reducing features)**

Performance Database: Data are stored in an internal spreadsheet

Data Source: EPA compares the number of existing homes that have been mitigated to all homes anywhere in the country requiring mitigation because they exceed the EPA action level of 4pCi/L.

Methods, Assumptions and Suitability:

EPA annually calculates the estimated number of existing homes mitigated for an elevated radon level based on radon mitigation vent fan sales data obtained through voluntary reporting by the fan manufacturers. Radon mitigation fans have an estimated life of ten years. When estimating the number of new radon mitigations annually, the data from fan manufacturers is adjusted based on an assumption that previously-installed radon mitigation systems will require a fan replacement every ten years. Historically, about 60% of the new homes built with radon-reducing features in the U.S. are built in Zone 1 areas, the highest risk areas (classified as Zone 1 by EPA).

The calculation of the number of homes across the country at or above EPA's 4pCi/L action level is based on methodology in the 1992 technical support document for radon (internal document available upon request) and current census data.

QA/QC Procedures: EPA relies on the radon fan manufacturers annual reporting on sales data for radon venting (vent) fans that are used for mitigation.

Data Quality Review: Data are obtained from an external organization. EPA reviews the data to ascertain their reliability and discusses any irregularities with the relevant manufacturer.

Data Limitations: Reporting by radon fan manufacturers is voluntary and may underestimate the number of radon fans sold. Nevertheless, these are the best available data to determine the number of homes mitigated. There are other methods to mitigate radon including: passive mitigation techniques of sealing holes and cracks in floors and foundation walls, installing sealed covers over sump pits, installing one-way drain valves in untrapped drains, and installing static venting and ground covers in areas like crawl spaces. Because there are no data on the occurrence of these methods, there is again the possibility that the number of radon mitigated homes has been underestimated.

No radon vent fan manufacturer, vent fan motor maker or distributor is required to report to EPA; they provide data/information voluntarily to EPA. There are only four (4) radon vent fan manufacturers of any significance; one of these accounts for an estimated 70% of the market. Radon vent fans are unlikely to be used for non-radon applications. However, vent fans typically used for non-radon applications are perhaps being installed as substitutes for radon vent fans in some instances; estimated to be less than 1% of the total market. Ascertaining the actual number of radon vent fans used for other applications, and the number of non-radon fans being substituted in radon applications, would be difficult and expensive at this time relative to the benefit of having such data.

Error Estimate: N/A.

New/Improved Data or Systems: None

References: See http://www.epa.gov/iaq/radon/pubs/index.html last accessed 12/15/2009 for National performance/progress reporting (National Radon Results: 1985 to 2003*) on radon, measurement, mitigation and radon-resistant new construction. Data through 2004 are available from the Indoor Environments Division of the Office of Air and Radiation.

<u>FY 2011 Performance Measure</u>:

- **Additional health care professionals trained annually by EPA and its partners on the environmental management of asthma triggers (program assessment measure)**

Performance Database: The performance database consists of quarterly Partner status reports used to document the outcomes of individual projects as well as EPA staff reports of healthcare professionals directly educated by EPA.

Data Source: Partner status reports are generated by those organizations receiving fundng from EPA and are maintained by individual EPA Project Officers. For those healthcare professionals directly trained by EPA, results are stored in project files.

Methods, Assumptions and Suitability: On an annual basis, EPA requires (programmatic terms and conditions of the award) all funded organizations to provide reports identifying how many health care professionals are educated about indoor asthma triggers.

QA/QC Procedures: It is assumed that organizations report data as accurately and completely as possible; site-visits are conducted by EPA project officers.

Data Quality Review: Project officers review data quality.

Data Limitations: N/A

New/Improved Data or Systems: The Indoors Environments Division has developed a centralized tracking system, known as IAQ Impact, to capture results from headquarters and regional actions, as well as from grantees.

References: N/A

FY 2011 Performance Measure:

- **Percent of public that is aware of the asthma program's media campaign (program assessment measure)**

Performance Database: In partnership with the Advertising Council, EPA conducts a national public awareness campaign designed to raise awareness and promote action on asthma trigger management. Data on this campaign, including target audience impressions, demographics, campaign recall, attitudes and behaviors are collected by the Ad Council through continuous tracking and point in time surveys.

Data Source: An independent initiative of the Advertising Council provides media tracking of outcomes of all their public service campaigns and this is publicly available information.

Methods, Assumptions and Suitability: Methods are those of the Advertising Council, and not controlled by EPA.

QA/QC Procedures: Methods are those of the Advertising Council, and not controlled by EPA.

Data Quality Review: Methods are those of the Advertising Council, and not controlled by EPA.

Data Limitations: Methods are those of the Advertising Council, and not controlled by EPA.

New/Improved Data or Systems: Methods are those of the Advertising Council, and not controlled by EPA.

References: Advertising Council Reporting. EPA Assistance Agreement number X-82820301.
For additional information see the Ad Council web site http://www.adcouncil.org/

FY 2011 Performance Measures:

- **Estimated annual number of schools establishing Indoor Air Quality programs based on EPA's Tools for Schools guidance (program assessment measure)**

Performance Database: To measure annual progress, EPA estimates the number of schools which establish IAQ Tools for Schools (TfS) programs each year from reports from partner organizations and regional recruiters, supplemented by tracking the volume of guidances distributed and number of people trained by EPA and its partners. EPA also collects information on program benefits such as reduced school nurse visits, improved workplace satisfaction among staff, reduced absenteeism, and cost savings experienced by schools.

Data Source: Partner status reports are generated by those organizations receiving funding from EPA and are maintained by individual EPA Project Officers. For those organizations directly trained by EPA, results are stored in project files.

Methods, Assumptions and Suitability: To measure annual progress, EPA estimates the number of schools which establish IAQ Tools for Schools programs each year from reports from partner organizations and regional recruiters, supplemented by tracking the volume of guidance distributed, and number of people trained by EPA and its partners.

QA/QC Procedures: It is assumed that partner organizations report data as accurately and completely as possible; site visits and regular communication with grantees are conducted by EPA projects officers.

Data Quality Review: EPA reviews the data from all sources in the performance database to ascertain reliability and to resolve any discrepancies.

Data Limitations: The primary limitation associated with Cooperative Agreement Partner status reporting is the error introduced as a result of self-reporting.

Error Estimate: Not relevant for this year.

New/Improved Data or Systems: The Indoor Environments Division has developed a centralized tracking system, known as IAQ Impact, to capture results from headquarters and regional actions, as well as from partners.

References: See the Indoor Air Quality Tools for Schools Kit (EPA 402-K-07-008)

GOAL 1 OBJECTIVE 3

FY 2011 Performance Measure:

- **Remaining US consumption of Class II ODS, measured in tons of ozone depleting potential (ODP) (program assessment measure)**

Performance Database: The Allowance Tracking System (ATS) database is maintained by the Stratospheric Protection Division (SPD). ATS is used to compile and analyze quarterly information on U.S. production, imports, exports, transformations, and allowance trades of ozone-depleting substances (ODS).

Data Source: Progress on restricting domestic exempted consumption of Class II HCFCs is tracked by monitoring industry reports of compliance with EPA's phase-out regulations. Data are provided by U.S. companies producing, importing, and exporting ODS. Corporate data are typically submitted as quarterly reports. Specific requirements as outlined in the Clean Air Act are available on the Internet at: http://www.epa.gov/ozone/title6/index.html. Monthly information on domestic production, imports, and exports from the International Trade Commission is maintained in the ATS.

Methods, Assumptions and Suitability: Data are aggregated across all U.S. companies for each individual ODS to analyze U.S. total consumption and production.

QA/QC Procedures: Reporting and record-keeping requirements are published in 40 CFR Part 82, Subpart A, Sections 82.9 through 82.13. These sections of the Stratospheric Ozone Protection Rule specify the required data and accompanying documentation that companies must submit or maintain on-site to demonstrate their compliance with the regulation.

The ATS data are subject to a Quality Assurance Plan (Quality Assurance Plan, USEPA Office of Atmospheric Programs, July 2002). In addition, the data are subject to an annual quality assurance review, coordinated by Office of Air and Radiation (OAR) staff separate from those on the team normally responsible for data collection and

maintenance. The ATS is programmed to ensure consistency of the data elements reported by companies. The tracking system flags inconsistent data for review and resolution by the tracking system manager. This information is then cross-checked with compliance data submitted by reporting companies. SPD maintains a user's manual for the ATS that specifies the standard operating procedures for data entry and data analysis. Regional inspectors perform inspections and audits on-site at the producers', importers', and exporters' facilities. These audits verify the accuracy of compliance data submitted to EPA through examination of company records.

Data Quality Reviews: The Government Accounting Office (GAO) completed a review of U.S. participation in five international environmental agreements, and analyzed data submissions from the U.S. under the Montreal Protocol on Substances the Deplete the Ozone Layer. No deficiencies were identified in their January 2003 report.

Data Limitations: None, since companies are required by the Clean Air Act to report data. EPA's regulations specify a quarterly reporting system.

Error Estimate: None.

New/Improved Data or Systems: The Stratospheric Protection Division is developing a system to allow direct electronic reporting.

References: See http://www.epa.gov/ozone/desc.html for additional information on ODSs. See http://www.epa.gov.ozone/intpol/index.html for additional information about the Montreal Protocol. See http://www.unmfs.org/ for more information about the Multilateral Fund. Quality Assurance Plan, USEPA Office of Atmospheric Programs, July 2002

GOAL 1 OBJECTIVE 4

FY 2011 Performance Measure:

- **Percentage of most populous U.S. cities with a RadNet ambient radiation air monitoring system, which will provide data to assist in protective action determinations. (program assessment measure)**

Performance Database: EPA database of RadNet program expansion. Data from the near real time gamma component of the ambient air radiation monitoring system, RadNet, will be stored in the EPA RadNet database at the National Air and Radiation Environmental Laboratory (NAREL) in Montgomery, AL.

Data Source: Data on the number and location of monitors will be stored in the NAREL RadNet program expansion database; U.S. Census Bureau population data will be used to calculate 100 most populous cities; environmental data from the RadNet system will be stored in the NAREL RadNet database.

Methods and Assumptions: These monitors will provide data on ambient environmental levels of radiation on an ongoing basis and in the event of a radioactive contamination event.

Suitability: This measure was selected to show the implementation of the fixed monitoring network and the benefit to population. Over time, once the system is fully implemented, this measure will become obsolete.

QA/QC Procedures: Quality Assurance and Quality Control Procedures will follow Agency guidelines and be consistent with the RadNet Quality Assurance Project Plan once it is complete (scheduled to be finalized in early 2008). Laboratory analyses of air filters and other media, as well as all calibrations, are closely controlled in compliance with the NAREL Quality Management Plan and applicable Standard Operating Procedures (EPA Office of Radiation and Indoor Air (ORIA), National Air and Radiation Environmental Laboratory Quality Management Plan Revision 1, dated March 15, 2001 and reaffirmed August 23, 2006).

Data Quality Review: Science Advisory Review Board reviewed and analyzed the RadNet system and presented their suggestions for the expansion and upgrade of the system.
http://yosemite.epa.gov/sab/sabproduct.nsf/C263E39FF10FEA11852573090068BD72/$File/sab-07-010.pdf

Data Limitations: N/A.

Error Estimate: It is not anticipated that significant error will occur in tracking the number of monitors placed in cities.

New/Improved Data or Systems: None planned at this time.

References: For more information about the system, see: www.epa.gov/narel/radnet \

<u>FY 2011 Performance Measure</u>:

- **Level of readiness of radiation program personnel and assets to support federal radiological emergency response and recovery operations (measured as percentage of radiation response team members and assets that meet scenario-based response criteria). (program assessment measure)**

Performance Database: Internal Database

Data Source: Annual measurement of readiness based on an evaluation of the emergency response assets.

Methods and Assumptions: EPA developed standardized criteria based on the functional requirements identified in the National Response Plan's Nuclear/Radiological Incident Annex and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). A baseline analysis for the Radiological Emergency Response Team (RERT) was performed in 2005, for EAP Headquarters and is based on the effectiveness of the RERT during incidents and national exercises.

Suitability: This measure and its criteria were developed to complement Department of Homeland Security criteria as well as those of the EPA Core Emergency Response and Removal (Core ER) program evaluation measures.

QA/QC Procedures: An evaluation panel consisting of three representatives from the Radiological Emergency Response Team (RERT), one from each Office of Radiation and Indoor Air (ORIA) Laboratory and one from ORIA Headquarters, and ORIA management representatives (including at least one representative from outside the ORIA Radiological Emergency Response Program) annually perform a critical evaluation of ORIA's Radiological Emergency Response Program's capabilities versus the standardized criteria, resulting in an overall annual percentage score, as well as component percentage scores. Representatives will not be involved in the evaluation of their own location. Members are chosen based on volunteerism and by lottery on an annual basis. The Panel is chaired by the non-RERT management representative

Data Quality Review: Evaluation information is provided to the ORIA Office Director annually for use in evaluating progress. Data quality is certified by the Laboratory Directors at the Radiation and Indoor Environments National Laboratory and the National Air and Radiation Environmental Laboratory as well as by the Division Director of the Radiation Protection Division.

Data Limitations: None known

Error Estimate: None known

New/Improved Data or Systems: N/A

References: Radiological Emergency Response Measurement Implementation Plan: Long-Term Outcome Performance Measure, Readiness. FY 2007 Radiation program Program Assessment (Draft: 7/25/2007)

<u>FY 2011 Performance Measure</u>:

- **Level of readiness of national environmental radiological laboratory capacity (measured as percentage of laboratories adhering to EPA quality criteria for emergency response and recovery decisions). (program assessment measure)**

Performance Database: Internal Database.

Data Source: EPA will conduct laboratory assessments between years 2006 to 2011 to determine commercial, state and federal laboratory capability, capacity, and qualifications. This is a phased-in approach and initial work has already begun. In 2007, EPA has conducted an initial capacity and capability survey of select commercial radiation laboratories.

Methods and Assumptions: The percentage laboratory capacity that is needed is based on the Homeland Security Council Radiological Attack, Radiological Dispersal Device Scenario. Similarly, radiological scenario analytical needs will be based on the Homeland Security Council Radiological Dispersion Device (RDD) Scenario. Laboratory capacity determines, for example, equipment needs, whereas, analytical needs measurement determines expert modeling capability, etc. Both are important factors in determining level of readiness. Increased laboratory capacity for those laboratories assisted through EPA guidance and training will be calculated.

Suitability: This measure is critical to identifying level of readiness relative to radiological laboratory capacity in the event of an incident of national significance.

QA/QC Procedures: Quality Assurance and Quality Control Procedures will follow Agency guidelines and be consistent with EPA's Office of Radiation and Indoor Air Quality Management Plan Revision, dated October 2004.

Data Quality Review: Information gained from the laboratory assessments with respect to capacity and ability to meet method validation protocols will be used to determine laboratory capacity, which adheres to EPA quality criteria.

Data Limitations: None known

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: Radiological Emergency Response Measurement Implementation Plan: Long-Term Outcome Performance Measure, Readiness. FY 2007 Radiation program Program Assessment (Draft: 7/25/2007)

<u>FY 2011 Performance Measure</u>:

- **Average time before availability of quality assured ambient radiation air monitoring data during an emergency. (program assessment measure)**

Performance Database: Data from the near real-time gamma component RadNet will be stored in an internal EPA database at the National Air and Radiation Environmental Laboratory (NAREL) in Montgomery, Alabama.

Data Source: The baseline for this measure is the current calculated response time which is based on shipment time and laboratory analysis time. As real-time monitors are put into service, the efficiency of the system will increase. Near real-time units will have reliable data in hours compared to days for conventional monitors, which are dependent on shipment and analysis time of samples.

Methods and Assumptions: The time between data collection at the monitoring sites and availability of data for release by EPA will be determined annually for the system as a whole, including existing (legacy) monitors and new near real-time monitors. The efficiency data will be compiled from existing and ongoing operational records of RadNet.

The monitoring system efficiency is based on two assumptions: (1) 43 conventional (non-real-time) monitoring stations exist in the system before the addition of any real-time monitors, and (2) a baseline of two and one-half days (60 hours) are required for data to become available (during emergency conditions) from the 43 non-real-time monitors. The initial interval of 2.5 days assumes the network is in alert status when time counting begins. Six (6) hours is the time required for data to become available from the near real-time monitors.

Suitability: This measure provides key data regarding availability of data and operational readiness of the nationwide RadNet ambient radiation monitoring network.

QA/QC Procedures: Quality Assurance and Quality Control Procedures will follow Agency guidelines and be consistent with the RadNet Quality Assurance Project Plan once it is complete (scheduled to be finalized in early 2008). Laboratory analyses of air filters and other media, as well as all calibrations, are closely controlled in compliance with the NAREL Quality Management Plan and applicable Standard Operating Procedures (EPA Office of Radiation and Indoor Air, National Air and Radiation Environmental Laboratory Quality Management Plan Revision 3 dated June 1, 2009).

Data Quality Review: The database will screen all incoming data from the monitoring systems for abnormalities as an indicator of either a contamination event or an instrument malfunction. Data will be held in a secure portion of the database until verified by trained personnel. Copies of quality assurance and quality control testing will also be maintained to assure the quality of the data.

Data Limitations: None known

Error Estimate: N/A

New/Improved Data or Systems: This measure will use data from the enhanced RadNet ambient air radiation monitoring system.

<u>FY 2011 Performance Measure</u>:

- **Time to approve site changes affecting waste characterization at DOE waste generator sites to ensure safe disposal of transuranic radioactive waste at WIPP (measured as percentage reduction from a 2004 baseline) (program assessment measure)**

Performance Database: Internal Database

Data Source: EPA has established a range of baseline data from existing records that indicate the date(s) of the EPA site inspection and the EPA approval date for waste streams and waste characterization equipment. EPA will measure the time between the DOE request for approval/notification of change (or the date of the inspection, if applicable) to the date of EPA approval, disapproval or concurrence of the change.

Methods and Assumptions: Under the new requirements of 40 CFR Part 194.8, EPA will perform a baseline inspection of each DOE waste generator site. If all requirements are met, EPA will approve the site's waste characterization program and assign tiers, based on abilities demonstrated during the baseline inspection. DOE will inform EPA of changes in the waste characterization program that can affect the quality of the data required by EPA to ensure the disposal regulations are met. The tiering protocol, which applies to waste streams, equipment, and procedures, will require DOE to either notify EPA of changes to the waste characterization program prior to implementation of the change (Tier 1) or to notify EPA of the changes upon implementation (Tier 2). For Tier 1 changes, EPA may request additional information or conduct an inspection prior to issuing an approval.

EPA assumes that adequate resources commensurate with the workload (which varies by up to 3 fold on an annual basis) are available and that sufficiently qualified EPA personnel and contractor consultants are available.

Suitability: This measure provides key information about the time required for EPA to approve DOE's request to dispose of transuranic waste at the WIPP site.

QA/QC Procedures: Quality Assurance and Quality Control Procedures will follow Agency guidelines and be consistent with EPA Office of Radiation and Indoor Air Quality Management Plan Revision, dated October 2004.

Data Quality Review: N/A

Data Limitations: None known

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: The Department of Energy National TRU Waste Management Plan Quarterly Supplement http://www.wipp.energy.gov/shipments.htm (last accessed

7/20/2009) contains information on the volumes of waste that are received at the DOE WIPP.

FY 2011 Performance Measure:

- **Population covered by Radiation Protection Program monitors per million dollars invested. (program assessment efficiency measure)**

Performance Database: EPA database of RadNet program expansion. The percent of the U.S. population covered is dependent on the number of monitors deployed and includes everyone in the continental U.S. within 25 miles of an ambient radiation monitor. Dollars invested includes the full budget of the Radiation Protection Program.

Data Source: The performance measurement data—percentage of U.S. population covered by the program—will be calculated annually from operational records maintained at the National Air and Radiation Environmental Laboratory. These records are an inherent part of program oversight and will not require special data collection efforts. U.S. population numbers are based on the Census 2000 from the U.S. Census Bureau. Program dollars are based on the full budget of the Radiation Protection Program, which will be retrieved from the EPA Financial Data Warehouse. The costs and data points produced will be determined annually for the system as a whole, including existing (legacy) monitors and new near real-time monitors.

Methods and Assumptions: This measure reflects the population covered (i.e., within 25 miles of a monitor) under an expanded and more robust system of radiation monitoring and assessment per program dollar. As such, it is a very conservative estimate of "coverage." In the event of a radiological emergency, the enhanced radiological monitoring system would support a number of response measures and activities that cover and apply to the population as a whole. This entails complete mobilization of EPA's Radiological Emergency Response Program and full deployment of all monitoring capability, including up to 40 portable RadNet monitors. The efficiency measure is defined as the total costs (including FTE) to run both the legacy and near real-time systems, which will provide scientists, decision makers, and the public information on ambient radiation levels in airborne particulates under normal conditions or during radiological incidents. As real-time monitors are put into service, the efficiency of the system will increase dramatically. Near real-time units produce reliable data each hour as opposed to twice weekly for conventional (legacy) monitors, which are dependent on shipment and analysis time of samples.

Suitability: This measure provides key information about population covered (i.e., within 25 miles of a monitor) under an expanded and more robust system of radiation monitoring and assessment per program dollar.

QA/QC Procedures: N/A

Data Quality Review: N/A

Data Limitations: None known

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: N/A

GOAL 1 OBJECTIVE 5

<u>FY 2011 Performance Measures</u>:

- **Million metric tons of carbon equivalent (mmtce) of greenhouse gas emissions reduced in the buildings sector (program assessment measure)**
- **Million metric tons of carbon equivalent (mmtce) of greenhouse gas emissions reduced in the industry sector (program assessment measure)**
- **Million metric tons of carbon equivalent (mmtce) of greenhouse gas emissions reduced in the transportation sector (program assessment measure)**

Performance Database: Climate Protection Partnerships Division Tracking System. The tracking system's primary purpose is to maintain a record of the annual greenhouse gas emissions reduction goals and accomplishments for the voluntary climate program using information from partners and other sources. It also measures the electricity savings and contribution towards the President's greenhouse gas intensity goal.

Data Source: EPA develops carbon and non-CO_2 emissions baselines. A baseline is the "business-as-usual" case without the impact of EPA's voluntary climate programs. Baseline data for carbon emissions related to energy use comes from the Energy Information Agency (EIA) and from EPA's Integrated Planning Model (IPM) of the U.S. electric power sector. These data are used for both historical and projected greenhouse gas emissions and electricity generation, independent of partners' information to compute emissions reductions from the baseline and progress toward annual goals. The projections use a "Reference Case" for assumptions about growth, the economy, and regulatory conditions. Baseline data for non-carbon dioxide (CO_2) emissions, including nitrous oxide and other high global warming potential gases, are maintained by EPA. The non-CO2 data are compiled with input from industry and also independently from partners' information.

Data collected by EPA's voluntary programs include partner reports on facility- specific improvements (e.g. space upgraded, kilowatt-hours (kWh) reduced), national market data on shipments of efficient products, and engineering measurements of equipment power levels and usage patterns

Baseline information is discussed at length in the U.S. Climate Action Report 2002. The report includes a complete chapter dedicated to the U.S. greenhouse gas inventory (sources, industries, emissions, volumes, changes, trends, etc.). A second chapter addresses projected greenhouse gases in the future (model assumptions, growth, sources, gases, sectors, etc.)

U.S. Department of State. 2002. "U.S. Climate Action Report—2002. Third National Communication of the United States of America under the United Nations Framework Convention on Climate Change."

Partners do contribute *actual* emissions data biannually after their facility-specific improvements but these emissions data are not used in tracking the performance measure. EPA, however, validates the estimates of greenhouse gas reductions based on the actual emissions data received.

Methods, Assumptions, and Suitability: Most of the voluntary climate programs' focus is on energy efficiency. For these programs, EPA estimates the expected reduction in electricity consumption in kilowatt-hours (kWh). Emissions prevented are calculated as the product of the kWh of electricity saved and an annual emission factor (e.g., metric tons carbon equivalent (MMTCE) prevented per kWh). Other programs focus on directly lowering greenhouse gas emissions (e.g., Natural Gas STAR, Landfill Methane Outreach, and Coalbed Methane Outreach); for these, greenhouse gas emission reductions are estimated on a project-by-project basis. EPA maintains a tracking system for emissions reductions.

The Integrated Planning Model, used to develop baseline data for carbon emissions, is an important analytical tool for evaluating emission scenarios affecting the U.S. power sector. The IPM has an approved quality assurance project plan that is available from EPA's program office.

QA/QC Procedures: EPA devotes considerable effort to obtaining the best possible information on which to evaluate emissions reductions from voluntary programs. Peer-reviewed carbon-conversion factors are used to ensure consistency with generally accepted measures of greenhouse gas (GHG) emissions, and peer-reviewed methodologies are used to calculate GHG reductions from these programs.

Partners do contribute *actual* emissions data biannually after their facility-specific improvements but these emissions data are not used in tracking the performance measure. EPA, however, validates the estimates of greenhouse gas reductions based on the actual emissions data received.

Data Quality Review: The Administration regularly evaluates the effectiveness of its climate programs through interagency evaluations. The second such interagency evaluation, led by the White House Council on Environmental Quality, examined the status of U.S. climate change programs. The review included participants from EPA and the Departments of State, Energy, Commerce, Transportation, and Agriculture. The results were published in the *U.S. Climate Action Report-2002* as part of the United States' submission to the Framework Convention on Climate Change (FCCC). The previous evaluation was published in the *U.S. Climate Action Report-1997*. A 1997 audit by EPA's Office of the Inspector General concluded that the climate programs examined "used good management practices" and "effectively estimated the impact their activities had on reducing risks to health and the environment..."

Data Limitations: These are indirect measures of GHG emissions (carbon conversion factors and methods to convert material-specific reductions to GHG emissions

reductions). Also, the voluntary nature of the programs may affect reporting. Further research will be necessary in order to fully understand the links between GHG concentrations and specific environmental impacts, such as impacts on health, ecosystems, crops, weather events, and so forth.

Error Estimate: These are indirect measures of GHG emissions. Although EPA devotes considerable effort to obtaining the best possible information on which to evaluate emissions reductions from its voluntary programs, errors in the performance data could be introduced through uncertainties in carbon conversion factors, engineering analyses, and econometric analyses. The only programs at this time aimed at avoiding GHG emissions are voluntary.

New/Improved Data or Systems: The Administration regularly evaluates the effectiveness of its climate programs through interagency evaluations. EPA continues to update inventories and methodologies as new information becomes available.

References: The U.S. Climate Action Report 2002 is available at: www.epa.gov/globalwarming/publications/car/index.html. The accomplishments of many of EPA's voluntary programs are documented in the Climate Protection Partnerships Division Annual Report. The most recent version is *Protecting the Environment Together: ENERGY STAR and other Voluntary Programs,* Climate Protection Partnerships Division 2007 Annual Report. http://www.energystar.gov/ia/partners/publications/pubdocs/2007%20CPPD%204pg.pdf

GOAL 1 OBJECTIVE 6

FY 2011 Performance Measures:

- **Percent of planned actions accomplished toward the long-term goal of reducing uncertainty in the science that supports the standard-setting and air quality management decisions (program assessment measure)**

Performance Database: Integrated Resources Management System (internal database)

Data Source: Data are generated based on self-assessments of: 1) overall progress toward completing research goals, and 2) completion of distinct planned program outputs.

Methods, Assumptions and Suitability: To provide an indication of progress towards achievement of the Clean Air Research Program's long-term goals, the program annually develops a list of key research milestones and outputs in support of the Multi-Year Plan that are scheduled for completion by the end of each fiscal year. This list is finalized by the start of the fiscal year, after which no changes are made. The program then tracks quarterly the progress towards completion of these key outputs against pre-determined schedules and milestones. The final score is the percent of key outputs from the original list that are successfully completed on-time.

QA/QC Procedures: Procedures are now in place to require that all annual milestones be clearly defined and mutually agreed upon within ORD by the start of each fiscal year. Progress toward completing these activities is monitored by ORD management.

Data Quality Reviews: N/A

Data Limitations: Data do not capture the quality or impact of the research milestones and outputs being measured. However, long-term performance measures and independent program reviews are used to measure research quality and impact. Additionally, completion rates of research outputs are program-generated, though subject to ORD review.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: Air Toxics Multi-Year Plan, available at: http://www.epa.gov/osp/myp/airtox.pdf (last accessed July 20, 2007)
Particulate Matter Multi-Year Plan, available at: http://www.epa.gov/osp/myp/pm.pdf (last accessed July 20, 2007)
National Ambient Air Quality Standards (NAAQS) Research Program Assessment, available at: http://www.whitehouse.gov/omb/expectmore/summary/10001137.2005.html (last accessed August 16, 2007)

FY 2011 Performance Measure:

- **Percent variance from planned cost and schedule (program assessment efficiency measure)**

Performance Database: Integrated Resources Management System (internal database).

Data Source: Data are generated based on 1) self-assessments of progress toward completing research goals, and 2) spending data.

Methods, Assumptions and Suitability: Using an approach similar to Earned Value Management, the data are calculated by: 1) determining the difference between planned and actual performance for each long-term goal (specifically, determining what percent of planned program outputs were successfully completed on time), 2) determining the difference between planned and actual cost for each long-term goal (specifically, determining the difference between what the program actually spent and what it intended to spent), and 3) dividing the difference between planned and actual performance by the difference between planned and actual cost.

QA/QC Procedures: N/A

Data Quality Reviews: N/A

Data Limitations: Program activity costs are calculated through both actual and estimated costs when activities are shared between programs. Performance data reflects only the key program outputs, and does not include every activity completed by a program. Additionally, completion rates of research outputs are program-generated, though subject to ORD review.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References:
National Ambient Air Quality Standards (NAAQS) Research Program Assessment, available at: http://www.whitehouse.gov/omb/expectmore/summary/10001137.2005.html (last accessed August 16, 2007)

<u>FY 2011 Performance Measures:</u>

- **Percentage of Clean Air program publications rated as highly cited papers (program assessment measure).**
- **Percentage of Clean Air program publications in "high impact" journals (program assessment measure).**

Performance Database: No internal tracking system.

Data Source: Searches of Thomson Scientific's *Web of Science* and *Scopus* are conducted to obtain "times cited" data for programs' publications. Analyses are completed using Thomson's *Essential Science Indicators (ESI)* and *Journal Citation Reports (JCR)* as benchmarks. *ESI* provides access to a unique and comprehensive compilation of essential science performance statistics and science trends data derived from Thomson's databases.

Methods, Assumptions and Suitability: For influence and impact measures, *ESI* employs both total citation counts by field and cites per paper scores. The former reveals gross influence while the latter shows weighted influence, also called impact. *JCR* is a recognized authority for evaluating journals. It presents quantifiable statistical data that provide a systematic, objective way to evaluate the world's leading journals and their impact and influence in the global research community. The two key measures used in this analysis to assess the journals in which a program's papers are published are the Impact Factor and Immediacy Index. The Impact Factor is a measure of the frequency with which the "average article" in a journal has been cited in a particular year. The Impact Factor helps evaluate a journal's relative importance, especially when compared to other journals in the same field.

QA/QC Procedures: N/A

Data Quality Reviews: N/A

Data Limitations: Analyses do not capture citations within EPA regulations and other key agency documents.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: Bibliometric Analysis for the U.S. Environmental Protection Agency/Office of Research and Development available at:
http://www.epa.gov/ncer/publications/bibliometrics/index.html

GOAL 2 OBJECTIVE 1

<u>FY 2011 Performance Measures</u>:

- **Percent of the population served by community water systems that meet all applicable health-based drinking water standards through approaches including effective treatment and source water protection (program assessment measure)**
- **Percent of the population in Indian country served by community water systems that receive drinking water that meets all applicable health-based drinking water standards (program assessment measure)**
- **Percent of person months during which community water systems provide drinking water that meets all applicable health-based standards (program assessment measure)**
- **Percent of community water systems that meet all applicable health-based standards through approaches that include effective treatment and source water protection (program assessment measure)**
- **The percentage of community water systems that have undergone a sanitary survey within the past three years (five years for outstanding performance) (program assessment measure)**
- **People receiving drinking water that meets all applicable health-based standards per million dollars spent to manage the drinking water program**

Performance Database: Safe Drinking Water Information System - Federal Version (SDWIS or SDWIS/FED). SDWIS contains basic water system information, population served, and detailed records of violations of the Safe Drinking Water Act and the statute's implementing health-based drinking water regulations. The performance measures are based on the percent of the population served by community water systems, or the percent of community water systems, that did not report any violations designated as "health based." Exceedances of a maximum contaminant level (MCL) and violations of a treatment technique are health-based violations.

Data Source: Data are provided by agencies with primacy (primary enforcement authority) for the Public Water System Supervision (PWSS) program. These agencies are either: States, EPA for non-delegated states or territories, and the Navajo Nation Indian tribe, the only tribe with primacy. Primacy agencies collect the data from the regulated water systems, determine compliance, and report a subset of the data to EPA (primarily inventory and summary violations).

Methods, Assumptions and Suitability: Under the drinking water regulations, water systems must use approved analytical methods for testing for contaminants. State certified laboratories report contaminant occurrence to states that, in turn, determine exceedances of maximum contaminant levels or non-compliance with treatment techniques and report these violations to EPA. These results are subject to periodic performance audits and

compared to results that states report to SDWIS. Primacy agencies' information systems and compliance determinations are audited on an average schedule of once every 3 years, according to a protocol. To measure program performance, EPA aggregates the SDWIS data into national statistics on overall compliance with health-based drinking water standards using the measures identified above.

QA/QC Procedures: EPA conducts a number of Quality Assurance/Quality Control steps to provide high quality data for program use, including:

(1) SDWIS/FED edit checks built into the software to reject erroneous data.
(2) Quality assurance manuals for states and Regions, which provide standard operating procedures for conducting routine assessments of the quality of the data, including timely corrective action(s).
(3) Training to states on reporting requirements, data entry, data retrieval, and error correction.
(4) User and system documentation produced with each software release and maintained on EPA's web site. System, user, and reporting requirements documents can be found on the EPA web site, http://www.epa.gov/safewater/. System and user documents are accessed via the database link http://www.epa.gov/safewater/databases.html, and specific rule reporting requirements documents are accessed via the regulations, guidance, and policy documents link http://www.epa.gov/safewater/regs.html.
(5) Specific error correction and reconciliation support through a troubleshooter's guide, a system-generated summary with detailed reports documenting the results of each data submission, and an error code database for states to use when they have questions on how to enter or correct data.
(6) User support hotline available 5 days a week.

The SDWIS/FED equivalent of a quality assurance plan is the data reliability action plan[1] (DRAP). The DRAP contains the processes and procedures and major activities to be employed and undertaken for assuring the data in SDWIS meet required data quality standards. This plan has three major components: assurance, assessment, and control.

Data Quality Review: Data Quality Review: Routine data quality assurance and quality control analysis of SDWIS by the Agency revealed a degree of non-reporting of violations of health-based drinking water standards, and of violations of regulatory monitoring and reporting requirements. As a result, the Agency is now tracking and quantifying the quality of data reported to SDWIS/FED as part of the Agency's National Water Program Guidance. The Agency will continue to follow and update the Data Reliability Implementation/Action Plan. EPA will continue to review the results of on-site data verification (and eDV) and initiate a discussion with individual states concerning any potential discrepancies with the data reported to SDWIS/FED. The on-site DV will be conducted as described in the Data Verification Protocol. Even as improvements are made, SDWIS serves as the best source of national information on compliance with Safe

[1] *2006 Drinking Water Data Reliability Analysis and Action Plan, EPA-816-R-07-010 March 2008*

Drinking Water Act requirements for program management, the development of drinking water regulations, trend analyses, and public information.

Data Limitations: Recent state data verification and other quality assurance analyses indicate that the most significant data quality problem is under-reporting by the states of monitoring and health-based standards violations and inventory characteristics. The most significant under-reporting occurs in monitoring violations. Even though those are not covered in the health based violation category, which is covered by the performance measure, failures to monitor could mask treatment technique and MCL violations. Such under-reporting of violations limits EPA's ability to: 1) accurately portray the percent of people affected by health-based violations, 2) target enforcement oversight, 3) target program assistance to primacy agencies, and 4) provide information to the public on the safety of their drinking water facilities. As described in the Data Quality Review section above, EPA has recently changed the data verification protocol to enhance the results of data audits and better understand the limitations of the data, and target assistance.

Error Estimate: EPA analyzes data, derived from a recently improved data audit protocol, with a robust statistical basis from which to extrapolate national results. This process is better aligned with requirements of the Data Quality Act. The long-term value of the improved audit process is that each year's results will be statistically representative and provide information closer in time to the needed performance reporting.

New/Improved Data or Systems: Several approaches are underway.

First, EPA will continue to work with states to implement the DRAP and ISP, which have already improved the completeness, accuracy, timeliness, and consistency of the data in SDWIS/FED through: 1) training courses for specific compliance determination and reporting requirements, 2) state-specific technical assistance, 3) increased number of data audits conducted each year, and 4) assistance to regions and states in the identification and reconciliation of missing, incomplete, or conflicting data.

Second, more states (as of August 2008, 53 States, Tribes, and territories are using SDWIS/STATE) will use SDWIS/STATE,[2] a software information system jointly designed by states and EPA, to support states as they implement the drinking water program.

Third, in 2006 EPA modified SDWIS/FED to (1) simplify the database, (2) minimize data entry options resulting in complex software, (3) enforce Agency data standards, and (4) ease the flow of data to EPA through a secure data exchange environment incorporating modern technologies, all of which will improve the accuracy of the data. Data are stored in a data warehouse system that is optimized for analysis, data retrieval,

---

[2] SDWIS/STATE is an optional data base application available for use by states and EPA regions to support implementation of their drinking water programs.
U.S. EPA, Office of Ground Water and Drinking Water. Data and Databases. Drinking Water Data & Databases – SDWIS/STATE, July 2002. Information available on the Internet: http://www.epa.gov/safewater/sdwis_st/current.html

and data integration from other data sources. It has improved the program's ability to more efficiently use information to support decision-making and effectively manage the program.

Finally, EPA, in partnership with the states, is developing a data system to manage information for the Underground Injection Control Program (UIC). This database will provide a more comprehensive data set with which to assess the nation's drinking water supplies, a key component of the goal. The UIC database began receiving data in 2007.

References:

Plans

- SDWIS/FED does not have a Quality Assurance Project Plan. The SDWIS/FED equivalent is the Data Reliability Action Plan
- Office of Water Quality Management Plan, available at http://www.epa.gov/water/info.html

Reports

- 2006 Drinking Water Data Reliability Analysis and Action Plan, EPA-816-R-07-010 March 2008

Guidance Manuals, and Tools

- PWSS SDWIS/FED Quality Assurance Manual
- Various SDWIS/FED User and System Guidance Manuals (includes data entry instructions, data On-line Data Element Dictionary-a database application, Error Code Data Base (ECDB) - a database application, users guide, release notes, etc.) Available on the Internet at http://www.epa.gov/safewater/sdwisfed/sdwis.htm
- Regulation-Specific Reporting Requirements Guidance. Available on the Internet at http://www.epa.gov/safewater/regs.html

Web site addresses

- OGWDW Internet Site http://www.epa.gov/safewater/databases.html and contains access to the information systems and various guidance, manuals, tools, and reports.
- Sites of particular interest are: http://www.epa.gov/safewater/data/getdata.html contains information for users to better analyze the data, and http://www.epa.gov/safewater/sdwisfed/sdwis.htm contains reporting guidance, system and user documentation and reporting tools for the SDWIS/FED system.

FY 2011 Performance Measure:

- **Percent of data for violations of health-based standards at public water systems that are accurate and complete.**

Performance Database: The Safe Drinking Water Information System/Federal Version (SDWIS/FED) is the Environmental Protection Agency's (EPA) principal database for the national drinking water program. EPA routinely conducts program reviews, which evaluate the management of state drinking water programs and provide the data on discrepancies in compliance determinations. During the program reviews, EPA examines state compliance decisions, data on system compliance and violations in the state files, and the data required to be reported to SDWIS/FED. Violation data are evaluated by comparing the following: 1) EPA's evaluation of the state's compliance decision on the violations; 2) the assigned violations in the state files; and 3) the violations reported to SDWIS/FED. EPA reviews data submitted by public water systems (PWSs), state files and databases, and SDWIS/FED, and compiles the results on the discrepancies among the data.

Data Source: After each program review, the program review staff information and enter it into the Error Code Tracking Tool (ECTT). The ECTT includes violation determinations and discrepancies, as well as the inventory information, including PWSID, system type, source, and population served.

Methods, Assumptions and Suitability: The program reviews involve the evaluation of the states' compliance decisions and the agreement between the data in the state files and SDWIS/Fed. EPA uses a statistically random sample of systems that is drawn from the total number of systems in the state for the program reviews. The sample size for each system type within a state is calculated based on the acceptable precision level for the estimates within 5% margin of error with a confidence level of 90 or 95 percent. EPA evaluates violation compliance results from the probability sample of systems for each state. Then, EPA estimates proportions related to completeness and accuracy among state files, the state database, and SDWIS/FED for violation data.

QA/QC Procedures: EPA is responsible for compiling and querying the data and, as needed, for assuring data validity. Also, EPA provides the states with the compiled data from ECTT to verify the validity of data and work with the states to correct any invalid data.

Data Quality Reviews: States have several opportunities to respond to findings while the program review personnel are on site and provide additional clarifying information if available. States also review the program review draft report before the final report is produced and their comments are incorporated into the report. EPA responds to every state comment, to explain in detail whether or not the state's additional information changed the finding.

Data Limitations: Because the overwhelming majority of systems are small systems, the group of systems selected for data verification may not always include larger systems.

Error Estimate: EPA analyzes data, derived from a recently improved data audit protocol, with a robust statistical basis from which to extrapolate national results. There are different systems and types reflected in the data. Error estimates are based on a 95 percent confidence interval.

New/Improved Data or Systems: EPA is currently testing and evaluating Electronic Data Verification (eDV) tool which would collect and evaluate compliance sample results of regulated contaminants and determine the completeness of the violations electronically for all PWSs. The eDV can be used to supplement the Program Review data in evaluating the completeness and accuracy of SDWIS/FED.

References:

U.S. EPA, Office of Ground Water and Drinking Water. *2006 Drinking Water Data Reliability Analysis and Action Plan.* EPA 816-R-07-010 (Washington: US EPA, August 2008). Available on the Internet at <http://www.epa.gov/safewater/databases/sdwis/datareliability.html>

<u>FY 2011 Performance Measure</u>:

- **Percentage of community water systems for which minimized risk to public health through source water protection is achieved.**

Performance Database: The source water assessment and protection programs are authorized under Sections 1453, 1428, and relevant subsections of 1452 of the Safe Drinking Water Act (SDWA).[3] EPA issued guidance to implement these programs in 1997, *State Source Water Assessment and Protection Programs Guidance*.[4] In March 2005, EPA issued supplemental reporting guidance, "State and Federal Source Water Assessment and Protection Program *Measures: Final Reporting Guidance."* Starting in FY 2005, and updated annually thereafter, states report to EPA on progress in implementing source water protection (SWP) strategies, and whether such strategy implementation is affecting public health protection. To assess *progress in implementing the SWP strategies*, state reporting includes two elements: (1) whether strategy implementation for a community water system has reached a substantial level, and (2) the related population served by those water systems. To assess *whether the program is affecting public health protection*, states report change in the number of Community Water System source water areas with substantially implemented source water protection strategies. The Agency will develop a national summary of data on the progress of states' source water protection programs using these data elements.

---

[3] *Safe Drinking Water Act Amendments of 1996*. P.L. 104-182. (Washington: 6 August 1996). Available on the Internet at <http://www.epa.gov/safewater/sdwa/sdwa.html>

[4] U.S. EPA, Office of Water. *State Source Water Assessment and Protection Programs Guidance*. EPA 816-R-97-009 (Washington: US EPA, August 1997). Available on the Internet at <http://www.epa.gov/safewater/swp/swappg.html>

States report summary data for each of these elements in a spreadsheet format. Beginning in FY 2005, states may, at their option, make available to EPA public water system-level data for each of these elements to be maintained in a set of data tables in the drinking water warehouse (for tabular data) and in event tables in the Office of Water's Reach Address Database (RAD) [5] (GIS data). These data will be compatible with the inventory data States are currently reporting to the Safe Drinking Water Information System (SDWIS).[6]

Data Source: Up to the end of FY 2004, states reported to the EPA Regional Offices the percentage of community water systems implementing source water protection programs. As noted above, states can report to EPA's Regional Offices using a spreadsheet approach. EPA has also developed a new source water data module to collect, store, and use public water system-level data as noted above.

Methods, Assumptions and Suitability: For this measure, the states' reporting of progress in implementing their source water assessment and protection programs will be based on EPA's 2005 guidance, "State and Federal Source Water Assessment and Protection Program *Measures: Final Reporting Guidance."* States will only report state-level summary information directly related to specific community water systems in a state-level database. While state reporting will be based on definitions and procedures found in the *"State and Federal Source Water Assessment and Protection Program Measures: Final Reporting Guidance,"* and even with the state flexibilities built into the definitions for substantial implementation strategies, EPA believes that the data will be reliable for use in making management decisions.

QA/QC Procedures: QA/QC procedures are included in the 2005 "State and Federal Source Water Assessment and Protection Program *Measures: Final Reporting Guidance."* Additionally, a series of data checks are built into the spreadsheet data collection procedures given to each Region for their work with states. States will be required to identify whether their reported summary-level data are based on a system-level database. EPA Regional offices also will work with individual states to obtain a description of their methods of collecting and verifying information.

Data Quality Reviews: EPA Regions will conduct data quality reviews of state data using the QA/QC procedures included with the spreadsheet-based data system, and work with states to resolve data issues. As a result, EPA expects the quality of data on the results of the assessments and source water protection activities to improve over time.

Data Limitations: Because the reporting provides only state-level summary information, there is no standard protocol for EPA to verify and validate the data against system-level information contained in state databases. In addition, much of the data reported by states is voluntary and based on working agreements with EPA because

---

[5] Watershed Assessment, Tracking & Environmental Results (WATERS). Available only on the Internet at <http://www.epa.gov/waters/>

[6] Safe Drinking Water Information System (SDWIS). Information available on the Internet at http://www.epa.gov/safewater/databases.html

SDWA only requires states to complete source water assessments. That is, the only source water information that states are required to report to EPA under SDWA is whether the assessments are completed. Although EPA's 2005 *"State and Federal Source Water Assessment and Protection Program Measures: Final Reporting Guidance"* set standard data definitions and procedures, it also provides for considerable flexibility in states' definition for substantial implementation of strategies, data collection protocols and analytical methods to evaluate their data. For example, some states may require each public water system to report data, while others may institute a voluntary process. Because much of the data reporting is voluntary and the individual state protocols may vary, state data may be incomplete and inconsistent across states.

Error Estimate: There is no basis for making an error estimate for this performance measure given the data limitations of state-level summary reporting described above.

New/Improved Data or Systems: The source water reporting module has been developed as a joint initiative between EPA, the Association of State Drinking Water Administrators (ASDWA), and the Ground Water Protection Council (GWPC). It will give EPA the ability to access the data directly from states through a data exchange agreement using an electronic data transfer capability. A state may choose, at its option, to provide EPA more detailed data in lieu of state-level summary reporting. The new source water data module has been integrated into the drinking water data warehouse and is compatible with Safe Drinking Water Information System (SDWIS) data already reported by states. Geospatial data (i.e., the intake and well point locations and the source water area polygons) will be maintained in EPA's Office of Water's Reach Access Database (RAD). The source water assessment and protection indicator data and other attribute data will be maintained in data tables in the drinking water warehouse.

References:

Guidance Manuals

- U.S. EPA, Office of Water. *State Source Water Assessment and Protection Programs Guidance*. EPA 816-R-97-009 (Washington: US EPA, August 1997). Available on the Internet at <http://www.epa.gov/safewater/swp/swappg.html>
- *Source Water Assessment and Protection Measures: Initial Guidance, August, 2003.*
- *"State and Federal Source Water Assessment and Protection Program Measures: Final Reporting Guidance,"* March 2005.

Web site addresses

- US EPA Office of Ground Water and Drinking Water. <http://www.epa.gov/safewater>
- For more detailed information on Source Water topics, US EPA Office of Ground Water and Drinking Water, Source Water site. <http://www.epa.gov/safewater/protect.html>

- US EPA Office of Water (OW) Reach Access Database (RAD). Watershed Assessment, Tracking & Environmental Results (WATERS). <http://www.epa.gov/waters/>
- Safe Drinking Water Information System (SDWIS). http://www.epa.gov/safewater/databases.html

FY 2011 Performance Measures:

- **Fund Utilization Rate for the DWSRF (program assessment measure)**
- **Number of additional projects initiating operations (program assessment measure)**

Performance Database: Drinking Water State Revolving Fund National Information Management System (DWNIMS.)

Data Sources: Data are entered by state regulatory agency personnel and by EPA's Regional staff; they are collected and reported once yearly.

Methods, Assumptions and Suitability: Data entered into DWNIMS directly represent the units of performance for the performance measure. These data are suitable for year-to-year comparison and trend indication.

QA/QC Procedures: EPA's headquarters and Regional offices are responsible for compiling the data and querying states as needed to assure data validity and conformance with expected trends. States receive data entry guidance from EPA headquarters in the form of annual memoranda (e.g., "2005 DWNIMS Data Collection.")

Data Quality Reviews: EPA's headquarters and Regional offices annually review the data submitted by the states. State data are publicly available at http://www.epa.gov/safewater/dwsrf/dwnims.html in individual state reports. Headquarters addresses significant data variability issues directly with states or through the appropriate EPA Regional office. Additionally, EPA's contractor tests the data for logical consistency. An annual EPA headquarters' "DWNIMS Analysis" provides detailed data categorization and comparison. This analysis is used during:

1. Annual EPA Regional office and state reviews to identify potential problems with the program's pace which might affect the performance measure.
2. Reviews by EPA's headquarters of regional oversight of state revolving funds.
3. Annual reviews by EPA's Regional offices of their states' revolving funds operations.

State data quality is also evaluated during annual reviews performed by EPA Regions. Any inconsistencies that are found in need of correction are incorporated into future DWNIMS reports. These adjustments are historically rare and very minor.

Data Limitations: There are no known limitations in the performance data, which states submit voluntarily. Erroneous data can be introduced into the DWNIMS database by typographic or definitional error. Typographic errors are controlled and corrected through data testing performed by EPA's contractor. Definitional errors due to varying interpretations of information requested for specific data fields have been largely reduced. These definitions are publicly available at: http://www.epa.gov/safewater/dwsrf/nims/dwdatadefs.pdf . There is typically a lag of approximately two months from the date EPA asks states to enter their data into the DWNIMS database, and when the data are quality-checked and available for public use.

New/Improved Data or Systems: This system has been operative since 1999. It is updated annually, and data fields are changed or added as needed.

References:
State performance data as shown in NIMS are available by state at:
http://www.epa.gov/safewater/dwsrf/dwnims.html
Definitions of data requested for each data field in NIMS is available at:
http://www.epa.gov/safewater/dwsrf/nims/dwdatadefs.pdf
2005 DWNIMS Data Collection – memo from Jeff Bryan, 7/12/05
DWNIMS analysis

<u>FY 2011 Performance Measures</u>:

- **Percentage of identified Class V motor vehicle waste disposal wells and other high priority Class V wells closed or permitted.**
- **Percent of deep injection wells that are used to inject industrial, municipal, or hazardous waste (Class I) that have lost mechanical integrity and are returned to compliance within 180 days thereby reducing the potential to endanger underground sources of drinking water**
- **Percent of deep injection wells that are used to enhance oil/natural gas recovery or for the injection of other (Class II) fluids associated with oil and natural gas production that have lost mechanical integrity and are returned to compliance within 180 days thereby reducing the potential to endanger underground sources of drinking water**
- **Percent of deep injection wells that are used for salt solution mining (Class III) that have lost mechanical integrity and are returned to compliance within 180 days thereby reducing the potential to endanger underground sources of drinking water**

Performance Database: The Underground Injection Control (UIC) program is authorized under Part C Sections 1421, 1422, 1423, 1425, 1431 and 1445 of the Safe Drinking Water Act (SDWA). Regulations for the UIC program are in 40 CFR Parts 144 - 148. Basic program information is collected from states and EPA's regional offices (regions) with direct implementation (DI) responsibilities through the 7520 Federal Reporting forms 1, 2A, 2B, 3 and 4. In July 2005, EPA issued a measures reporting assistance memorandum, "Information to Assist Regions and States to Report on

Underground Injection Control Program's National Water Program Guidance Performance Activity Measures." Starting in FY 2005, including annual updates thereafter, states report to EPA the results of their UIC performance measures. In the initial 2005 reporting, states or the regions, if they have direct implementation of the program, report the following information: (1) The number of Class I, II, III, and V violations and significant violations that have been identified and addressed; (2) the number of Class I, II, III and V inspections; (3) The number of Class I, II and III salt solution mining wells that maintained mechanical integrity; (4) the number of Class V wells in Source Water Protection Areas (SWPAs) with surveys completed; and (5) the number of high priority wells in ground water based SWPAs that are closed or permitted. This information was reported to help determine the impact that the UIC program is having relative to public health protection. It also helps assess the progress being made to protect underground sources of drinking water (USDW).

In FY 2003, EPA maintained pilot state-level summary data for each of these reporting elements in a spreadsheet format. In FY 2005, states and/or regions reported summary measures information through a spreadsheet. In FY 2006, measures data was entered into a web-based reporting form which mirrored the spreadsheet from the previous year. The UIC program began collecting program information in a UIC national database in 2007; this system electronically transfers information from state databases to EPA's national database using EPA's Exchange Network. EPA is currently working with the regions and several states to complete development of the system and to begin populating it. FY 2008 is a transition year to test efficacy of the new data system and the quality of the submitted data. Planned implementation is 2008 through 2012.

Data Source: Until the UIC national database is deployed for use, states or DI programs will report to EPA using the UIC Inventory/Performance Activity Measures System. This is a web-base data entry system. States and DI programs began transition to the UIC national data system for reporting of UIC data in 2007. - See section "New/Improved Data or Systems."

Methods, Assumptions and Suitability: For these measures, the states' reporting of progress is based on EPA's 2005 guidance, "Information to Assist Regions and States to Report on Underground Injection Control Program's National Water Program Guidance Performance Activity Measures." States will only report state-level summary information, much of which is contained in state databases. State reporting will be based on definitions and procedures found in the guidance. EPA believes that the data will be reliable for use in making management decisions.

QA/QC Procedures: QA/QC procedures include validation of information in states' 7520 reporting forms. Additionally, a series of data checks are built into the web entry system. EPA's regional offices also will work with individual states to verify information. Additional checks are performed by EPA headquarters on randomly selected states.

Data Quality Reviews: EPA's regional offices will conduct data quality reviews of state data using the QA/QC procedures and work with states to resolve data issues. EPA headquarters will communicate any additional concerns that may occur. The national data system includes software to reject erroneous data. As a result, EPA expects the quality of data on the results of the assessments and source water protection activities to improve over time.

Data Limitations: Current reporting only provides summary-level information. There is no standard protocol for EPA to verify and validate this summary data against well-level information contained in state databases. Some of the information used for calculation of the measures has not been collected historically reducing the availability of information, which may cause the data to be incomplete and inconsistent across states.

Error Estimate: There is no basis for making an error estimate for these performance measures given the data limitations of state-level summary reporting described above.

New/Improved Data or Systems: The UIC national data base is being developed though consultation with regions and states. It will give EPA the ability to access the data directly from states through the Exchange Network using the Central Data Exchange (CDX). The data system will not only include the data for the measures but all of the data necessary for EPA to effectively manage the national program.

References:

Guidance, Regulations and Data Forms

- Information to Assist Regions and States to Report on Underground Injection Control Program's National Water Program Guidance Performance Activity Measures (Reporting Assistance Memo)--7/06/06

- Code of Federal Regulations at 40 CFR Parts 144 through 148

- UIC Inventory/Performance Activity Measures Web Data Entry System

- 7520 Federal Reporting Forms (OGWDW Homepage-UIC Program)
  Form 7520-1 Permit Review and Issuance/Wells in Area of Review
  Form 7520-2A (Compliance Evaluation)
  Form 7520- 2B (Compliance Evaluation/ Significant Noncompliance)
  Form 7520-3(Inspections/Mechanical Integrity Testing)
  Form 7520-4 (Quarterly Exceptions List)

Web site addresses

- *Safe Drinking Water Act Amendments of 1996*. P.L. 104-182. (Washington: 6 August 1996). Available on the Internet at: http://www.epa.gov/safewater/sdwa/sdwa.html

- For more detailed information on Underground Injection topics, US EPA Office of Ground Water and Drinking Water/UIC Program. Available on the website: http://www.epa.gov/safewater/uic.html

FY 2011 Performance Measure:

- **Percentage of women of child-bearing age having mercury levels in blood above the level of concern identified by the National Health and Nutrition Examination Survey (NHANES).**

Performance Database: There is no publicly accessible database that contains this information. Rather, the information is reported by the Centers for Disease Control and Prevention (CDC) on public use data files every two years. The latest report is the *Fourth National Report on Human Exposure to Environmental Chemicals*, which presents findings for the years 2003 and 2004, and was published in 2009.[1]

Data Source: CDC's National Center for Health Statistics conducts the National Health and Nutrition Examination Survey (NHANES) in which chemicals or their metabolites are measured in blood and urine samples from a random sample of participants. NHANES is a series of surveys designed to collect data on the health and nutritional status of the U.S. population. CDC reports the NHANES results in the *National Report on Human Exposure to Environmental Chemicals*. The *Second National Report on Human Exposure to Environmental Chemicals* was released in 2003 and presented biomonitoring exposure data for 116 environmental chemicals for the civilian, non-institutionalized U.S. population over the 2-year period 1999-2000. The *Third National Report on Human Exposure to Environmental Chemicals* presents similar exposure data for the U.S. population for 148 environmental chemicals over the period 2001-2002. The Fourth Report, which includes the data from the Second and Third Reports, measures 212 chemicals over the period 2003-2004.

Methods and Assumptions: Biomonitoring measurements for the Report were from samples from participants in NHANES. NHANES collects information about a wide range of health-related behaviors, performs a physical examination and collects samples for laboratory tests. Beginning in 1999, NHANES became a continuous survey, sampling the U.S. population annually and releasing the data in two-year cycles. (Note, however, that the Fourth Report was issued four years after the Third Report.) The sampling plan follows a complex, stratified, multistage, probability-cluster design to select a representative sample of the civilian, noninstitutionalized population in the United States. Additional detailed information on the design and conduct of the NHANES survey is available at http://www.cdc.gov/nchs/nhanes.htm. The CDC National Center for Health Statistics (NCHS) provides guidelines for the analysis of NHANES data at http://www.cdc.gov/nchs/data/nhanes/nhanes_general_guidelines_june_04.pdf. Other details about the methodology including statistical methods are reported in the *Fourth National Report on Human Exposure to Environmental Chemicals*.

Suitability: This indicator was selected because it provides an indication of levels of exposure in the human population to organic mercury where the main source is the consumption of fish and shellfish contaminated with methylmercury. As consumers follow fish consumption advice, changes in mercury in blood levels will decrease. This measure is not suitable for annual comparison but the periodic reports from NHANES provide a direct measure of mercury in blood levels in a representative sample of the US population.

QA/QC Procedures: The CDC quality assurance and quality control procedures are not specified in the *Fourth National Report on Human Exposure to Environmental Chemicals*. However, the Data Sources and Data Analysis chapter in the report does delineate the assumptions inherent in the analysis.

Data Quality Review: The data comes from the NHANES study, which CDC has designed to have a high quality.

Data Limitations: NHANES is designed to provide estimates for the civilian, non-institutionalized U.S. population. The current design does not permit examination of exposure levels by locality, state, or region; seasons of the year; proximity to sources of exposure; or use of particular products. For example, it is not possible to extract a subset of the data and examine levels of blood lead that represent levels in a particular state's population.

Error Estimate: The *Fourth National Report on Human Exposure to Environmental Chemicals* provides 95% confidence intervals for all statistics
New/Improved Data or Systems: None.

References:

1. Centers for Disease Control and Prevention. "Fourth *National Report on Human Exposure to Environmental Chemicals*. July 2005. http://www.cdc.gov/exposurereport/. December 2009.

FY 2011 Performance Measure:

- **Number of waterborne disease outbreaks attributable to swimming in or other recreational contact with, coastal and Great Lakes waters measured as a five-year average.**

Performance Database: Data on waterborne disease outbreaks (WBDOs) are collected by the states and are submitted to the Centers for Disease Control (CDC) under an agreement with the Council of State and Territorial Epidemiologists, the organization that sponsors the collection of the data. EPA/ORD collaborates with CDC in the analysis of the data. The data are published every two years for the prior second and third years' occurrence of outbreaks as a Surveillance Summary in the CDC's Morbidity and Mortality Weekly Report (MMWR), e.g., data from 1997-1998 were published in 2000;

data from 2005-2006 were published in 2008[1]. Outbreaks of gastroenteritis, dermatitis, and other diseases are listed according to date of occurrence, state in which the outbreak occurred, etiological agent, the number of cases that resulted from the outbreak, class of the outbreak data (index of data quality for the reporting of the outbreak), and the type of source (e.g., lake, river, pool) involved.

Data Source: Since 1971, CDC and the U.S. Environmental Protection Agency have maintained a collaborative surveillance system for collecting and periodically reporting data that relate to occurrences and causes of WBDOs. The surveillance system includes data about outbreaks associated with drinking water and recreational water. State, territorial, and local public health departments are primarily responsible for detecting and investigating WBDOs and for voluntarily reporting them to CDC.

Methods and Assumptions: State, territorial, and local public health agencies report WBDOs to CDC on a standard form (CDC form 52.12). CDC annually requests reports from state and territorial epidemiologists or from persons designated as WBDO surveillance coordinators. As indicated above, the data are submitted to CDC by the states under an agreement with the Council of State and Territorial Epidemiologists. Original data forms and the primary database itself are not available for external review because of concerns about the integrity and confidentiality of the data, which include information such as the names of data reporters, specific identities of water bodies, and identities of facilities and properties, both public and private, at which the outbreaks occurred. Most outbreaks occur in treated man-made water environments which are not reflective of outcomes of Clean Water Act programs. Others occur in untreated natural waters in smaller water bodies not affected by EPA programs or activities. Accordingly, cooperation of database managers is required to identify specific outbreaks which should be counted under this measure as occurring in waters of the United States.

The unit of analysis for the WBDO surveillance system is an outbreak, not an individual case of a waterborne disease, although this information is reported. Two criteria must be met for an event to be defined as a water-associated disease outbreak. First, two or more people must have experienced a similar illness after exposure to water. This criterion is waived for single cases of laboratory-confirmed primary amebic meningoencephalitis (PAM). WBDOs associated with cruise ships are not summarized in the CDC report.

Suitability: This indicator is suitable as a performance measure because it captures the increased incidence of outbreaks from recreational water contact due to poor water quality conditions. Controlling sources of water contamination would result in maintaining or improving water quality conditions, thereby avoiding an increase in outbreaks

QA/QC Procedures: Data are submitted to CDC on a standard reporting form in hard copy by mail. Procedures for reporting outbreaks on the Internet for web-entry electronic submission are currently under development. Upgrades to the reporting system to incorporate electronic data reporting are anticipated to be implemented within the next three years[1]. Currently, CDC annually obtains reports from state or territorial

epidemiologists or persons designated as WBDO surveillance coordinators. Numeric and text data are abstracted from the outbreak form and supporting documents and entered into a database for analysis. Information on QA/QC procedures employed by the individual states or other reporting entities is not included in the CDC reporting.

Data Quality Review: The CDC and EPA/ORD report team review the outbreak reports to ensure the information is complete, following up with the state or local government to obtain additional information where needed. There are currently no external party reviews of this information conducted prior to publication.

WBDOs reported to the surveillance system are classified according to the strength of the evidence implicating water as the vehicle of transmission. The classification scheme (i.e., Classes I--IV) is based on the epidemiologic and water-quality data provided on the outbreak report form. Epidemiologic data are weighted more than water-quality data. Although outbreaks without water-quality data might be included in this summary, reports that lack epidemiologic data were excluded. Single cases of PAM are not classified according to this scheme. Weighting of epidemiologic data does not preclude the relative importance of both types of data. The purpose of the outbreak reporting system is not only to implicate water as the vehicle for the outbreak but also to understand the circumstances that led to the outbreak.

Data Limitations: There are three primary limitations to the CDC WBDO data with respect to this performance measure. The first limitation relates to original data forms and the primary database itself not being available for external review. The implication of this limitation is that database managers or report authors will have to be consulted to identify which of the reported outbreaks have, in fact, occurred in Waters of the United States. The second limitation is the fact that very few outbreaks have been reported over the ten years of data that have been reviewed in consideration of a baseline for this measure.[2-6] The implication of this measure is that were a small number of outbreaks to occur within a given year, it may still be within the range of normal statistical variability and therefore not an effective performance measure. Third, CDC issues its reports on a variable schedule. Thus, our ability to report current data is hindered.

Another limitation of the data collected as part of the WBDO surveillance system is that the information pertains only to disease outbreaks rather than endemic illness. The epidemiologic trends and water-quality concerns observed in outbreaks might not necessarily reflect or correspond with trends associated with endemic waterborne illness. To address this problem, EPA and CDC are collaborating on the NEEAR Water Study to assess the magnitude of waterborne illness associated with routine, non-outbreak-associated exposure to marine and freshwater recreational areas.

Error Estimate: The relative quality of data and the error estimate associated with data of a given quality are indicated by the classification of the outbreak report. A classification of I indicates that adequate epidemiologic and water-quality data were reported. Specifically, a classification of I indicates that adequate data were provided about exposed and unexposed persons with a relative risk or odds ratio of =>2 or P value

of =<0.05, which indicates statistical significance. Higher classification numbers (II-IV) indicate relatively higher error estimates based on factors such as completeness of data and sample size. For instance, outbreaks that affect fewer persons are more likely to receive a classification of III rather than I because of the relatively limited sample size available for analysis.

New/Improved Performance Data or Systems: The manual reporting of WBDOs has been practiced since the collaborative surveillance system for collecting and reporting data began in 1971. Plans are still in place to transform the outbreak reporting system in future years to incorporate electronic data reporting. It is anticipated that the implementation of such upgrades will increase the number of reported outbreaks substantially. An increased number of reported WBDOs resulting from electronic reporting would require the baseline for the performance measure to be reset to a baseline consistent with the new level of reporting in order to yield meaningful trends in the occurrence of waterborne outbreaks in the future.

References

1. Yoder JS, Hlvasa MC, Craun GF, et al. Surveillance for Waterborne Disease and Outbreaks – United States, 2005-2006. In: CDC Surveillance Summaries, September 12, 2008. MMWR 2008;57(SS-09); 1-29.
2. U.S. EPA. Office of Research and Development. Personal Communication w/ Calderon RL, author. Washington, DC, December 2005.
3. Yoder JS, Blackburn BG, Craun GF, Hill V, Levy DA, Calderon RL, et al. Surveillance for waterborne-disease outbreaks---United States, 2001--2002. In: CDC Surveillance Summaries, October 22, 2004. MMWR 2004;53(SS-08): 1--22
4. Lee SH, Levy DA, Craun GF, Beach MJ, Calderon RL. Surveillance for waterborne-disease outbreaks---United States, 1999--2000. In: CDC Surveillance Summaries, November 22, 2002. MMWR 2002; 51(SS-8): 1--47.
5. Barwick RS, Levy DA, Craun GF, Beach MJ, Calderon RL. Surveillance for waterborne disease outbreaks---United States, 1997--1998. In: CDC Surveillance Summaries, May 26, 2000. MMWR 2000; 49 (No. SS-4):1--34.
6. Levy DA, Bens MS, Craun GF, Calderon RL, Herwaldt BL. Surveillance for waterborne-disease outbreaks---United States, 1995--1996. In: CDC Surveillance Summaries, December 11, 1998. MMWR 1998; 47(No. SS-5):1--34.
7. Kramer MH, Herwaldt BL, Craun GF, Calderon RL, Juranek DD. Surveillance for waterborne-disease outbreaks---United States, 1993--1994. In: CDC Surveillance Summaries, April 12, 1996. MMWR 1996; 45 (No. SS-1):1--33.

FY 2011 Performance Measure:

- **Percent of days of the beach season that coastal and Great Lakes beaches monitored by state beach safety programs are open and safe for swimming.**

Performance Database: The data are stored in PRAWN (Program tracking, beach Advisories, Water quality standards, and Nutrients), This database includes fields

identifying the beaches for which monitoring and notification information are available and the date an advisory or closure was issued, thus enabling trend assessments to be made. The database also identifies those states that have received a BEACH (Beaches Environmental Assessment and Coastal Health) Act [P.L. 106-284] grant. EPA reports the information annually, on a calendar year basis, each May. The calendar year data are then used to support fiscal year commitments (e.g., 2009 calendar year data are used to report against FY 2010 commitments). For the 2008 swimming season, states and territories monitored for pathogens at 3,740 coastal and Great Lakes beaches. In re-evaluating their beach programs, some states combined small beaches into larger beaches during 2007, reducing the total number of beaches monitored (from 3,771 in 2006 to 3,602 in 2007), but maintaining the scope of their programs.[1]

Data Source: Since 1997 EPA has surveyed state and local governments for information on their monitoring programs and on their advisories or closures. The Agency created the PRAWN database to store this information. State and local governmental response to the survey was voluntary up through calendar year 2002. Starting in calendar year 2003, data for many beaches along the coast and Great Lakes had to be reported to EPA as a condition of grants awarded under the BEACH Act.[2] Since 2005, states have used an on-line process called eBeaches to electronically transmit beach water quality and swimming advisory information to EPA instead of using the paper survey. The latest information reported by a state or local government is accessible to the public through the BEACON (Beach Advisory Closing On-line Notification) system.

Methods and Assumptions: The data are an enumeration of the days of beach-specific advisories or closures issued by the reporting state or local governments during the year. Performance against the target is tracked using a simple count of the number of beaches responding to the survey and the days over which the advisory or closure actions were taken. This is compared to the total number of days that every beach could be open. Thus the data are suitable for the performance measure.

Suitability: This indicator is suitable as a performance measure because it captures the frequency of beach closings primarily due to poor water quality conditions. Controlling sources of contamination would result in water quality improvement at beach thereby leading to fewer closures.

QA/QC Procedures: Since 1997, EPA has distributed a standard survey form, approved by OMB, to coastal and Great Lake state and county environmental and public health beach program officials in hard copy by mail. The form is also available on the Internet for web-entry electronic submission. When a state or local official enters data using the web-entry format, a password is issued to ensure the appropriate party is completing the survey. Currently the Agency has procedures for information collection (see Office of Water's "Quality Management Plan," approved September 2001 and published July 2002[3]). In addition, coastal and Great Lakes states receiving BEACH Act grants are subject to the Agency's grant regulations under 40 CFR 31.45. These regulations require states and tribes to develop and implement quality assurance practices for the collection of environmental information.

Data Quality Review: EPA reviews the survey responses to ensure the information is complete, following up with the state or local government to obtain additional information where needed. The Agency also reviews the QA/QC reports submitted by states and territories as part of their grant reporting. There have been no external party reviews of this information.

Data Limitations: From calendar year 1997 to calendar year 2002, participation in the survey and submission of data was voluntary. While the voluntary response rate was high, it did not capture the complete universe of beaches. The voluntary response rate was 92% in calendar year 2002 (240 out of 261 contacted agencies responded). The number of beaches for which information was collected increased from 1,021 in calendar year 1997 to 2,823 in calendar year 2002. Participation in the survey is now a mandatory condition for implementation grants awarded under the BEACH Act program to coastal and Great Lakes states, with information now available for 3,602 of approximately 6,000 coastal and Great Lakes beaches. All coastal and Great Lakes states and territories receive the implementation grants.

Error Estimate: Not all coastal and Great Lakes beaches are monitored. In 2008, states and territories reported that they monitored at 3,740 of the approximately 6,000 coastal and Great Lakes beaches. This monitoring varies among states. For example, North Carolina monitors all its 240 beaches whereas South Carolina monitors 23 of 299 beaches it identified. Where monitoring is done, there is some chance that the monitoring may miss some instances of high pathogen concentrations. EPA's 2002 National Health Protection Survey of Beaches found that 90% of the nation's beaches are monitored once a week or less.[4] Studies in southern California found that weekly sampling missed 75% of the pathogen exceedances,[5] and that 70% of the exceedances lasted for only one day.[6] An EPA Office of Research and Development (ORD) beach monitoring study found a positive correlation between pathogen indicator densities one day as compared to densities the next day, but that the correlation was negligible when compared to densities after four days.[7] These studies indicate that weekly sampling most likely misses many pathogen events that can affect public health. This information is not sufficient to calculate the potential error in the reporting, but it is sufficient to indicate that the reporting may understate the number of days that beaches should be closed or under advisory.

New/Improved Data or Systems: Four years after the passage of the BEACH Act many states and territories were struggling to submit their data in a timely manner, impeding our efforts to produce a timely annual report. The Information Technology (IT) system used to capture beach reporting data was built shortly after the passage of the BEACH Act to make maximum use of existing Agency data systems, especially STORET, at the cost of some compromise in data flow efficiency. A plan was developed by working closely with state data managers to address obstacles to data submittal: focusing contractor support on technical assistance to the states; transmitting letters directly to state program managers regarding the performance of their organizations in either meeting, coming close, or not meeting the data submittal target dates; implementing

systems changes to keep up with the pace of Agency system upgrades; and altering the data architecture to simplify data flows.

References:

1. U.S. EPA. Office of Water. "EPA's Beach Report: 2008 Swimming Season." EPA-823-F-08-006. Washington, DC, May 2009. Available at http://www.epa.gov/waterscience/beaches/seasons/2008/index.html
2. U.S. EPA. Office of Water. "National Beach Guidance and Required Performance Criteria for Grants." EPA-823-B-02-004. Washington DC: EPA, June 2002. Available at http://www.epa.gov/waterscience/beaches/grants/guidance/index.html
3. U.S. EPA. Office of Water. "A Quality Management Plan." EPA 821-X-02-001. Washington, DC, July 2002. Available at http://www.epa.gov/water/programs/qmp_july2002.pdf
4. U.S. EPA. Office of Water. "EPA's BEACH Watch Program: 2002 Swimming Season." EPA-823-F-03-007. Washington, DC, May 2003. Available at http://www.epa.gov/waterscience/beaches/seasons/beachwatch2003-newformat.pdf
5. Leecaster. M.K. and S.B. Weisberg, Effect of Sampling Frequency on Shoreline Microbiology Assessments, *Marine Pollution Bulletin*, 42(11), 2001.
6. Boehm, A.B., et. al., Decadal and Shorter Period Variability of Surf Zone Water Quality at Huntington Beach, California, *Environmental Science and Technology*, 36(18), 2002.
7. U.S. EPA. Office of Research and Development. "The EMPACT Beaches Project, Results and Recommendations from a Study on Microbiological Monitoring In Recreational Waters." EPA 600/R-04/023. Washington, DC, August 2005.

GOAL 2 OBJECTIVE 2

FY 2011 Performance Measure:

- **Percentage of waters assessed using statistically valid surveys (program assessment measure)**

Performance Database: Data generated from the national assessment will be housed in the EPA Office of Water's STORET (STOrage and RETrieval) data warehouse. Prior to entering the STORET warehouse, all datasets are housed in a temporary facility, such as ORD's SWIM database, where they are examined for QA purposes and undergo statistical analysis. Finalized datasets transferred to the STORET warehouse will include all water quality, physical and biological data and associated metadata for each survey. The STORET warehouse is available on the web at http://www.epa.gov/STORET/index.html. Once the data schema for biological and habitat data are developed and deployed for the Exchange Network-based water quality exchange (WQX), these data will be submitted to the warehouse via WQX.

Data Source: Data are collected, processed and analyzed through EPA-State collaboration to assess and report on the condition of the nation's waters with documented confidence. Under this partnership, samples are collected across the country

during a specified index period for each resource. Sites are sampled one time, with additional repeat samples collected at 10 percent of the sites to determine precision of methods. Surveys collect a suite of indicators relating to the biological, physical habitat and water quality of the resource in order to assess the resource condition and determine the percentage meeting the goals of the CWA. Surveys will collect information on biological and abiotic factors at 30-50 sites on an ecoregion level II scale for each resource. Prior to sampling, field crews will undergo intensive training by EPA personnel on field sampling and collection techniques. Laboratory analysis will be conducted at either a state lab or contract lab following specified protocols for the survey. Data collection follows a Quality Assurance Project Plan (QAPP), with subsequent testing and auditing to ensure its application.

Methods, Assumptions and Suitability: The surveys are conducted using a probabilistic survey design, which allows extrapolation of results to the target population (specified water resource, e.g., wadeable streams, lakes, rivers, etc.). The collection design maximizes the spatial spread between sites, located by specific latitude and longitude combinations. The survey utilizes an indexed sampling period to increase the probability of accurately assessing condition and identifying any problems in water quality, physical or biological indices if they exist. Based on the QAPP and field protocol documents, a site is located by the sampling crew via Global Positioning System (GPS). Data are collected for each parameter following the protocols outlined in the field operations manual. Indices for the probabilistic surveys relate to the condition of the resource and the extent that the waters are supporting the fishable and swimmable goals of the Clean Water Act. Samples taken from the field are stored in accordance with field manual instructions and shipped to the processing laboratory. Laboratories will follow quality assurance (QA) plans and complete analysis and provide electronic information to the state or EPA. EPA and the state exchange data to ensure that each has a complete set. EPA and states analyze the data to assess regional and national condition of the water resource surveyed. Results of the analyses on a national and regional basis will be published in a publicly accessible peer reviewed report released within two years of sample collection. The overall change in condition of the waterbody type will be assessed on a five year cycle.

> *Assumptions*: (1) The underlying target population (water resource sampled for the survey) has been correctly identified; (2) GPS is successful; (3) QAPP and field collection manuals are followed; (4) all samples are successfully collected; (5) all analyses are completed in accordance with the QAPP; and (6) a combination of data into indices is completed in a statistically rigorous manner.
>
> *Suitability:* By design, all data are suitable to be aggregated up to the regional and national level to characterize the ecological condition of the waterbody resource and the associated stressors. Samples provide site specific point-in-time data and excellent representation of the entire resource (extrapolation to the entire resource supportable). Data will be used to characterize populations and subpopulations of waterbody resources through time and space. Data analysis and interpretation will be peer reviewed prior to completion of final report. The data are suitable for

individual reports and to establish a baseline for subsequent surveys to evaluate trends.

QA/QC Procedures: Collection and processing of all samples are described in QAPP and Field Protocols documents associated with each survey. In addition, the QAPP will contain specific Data Quality Objectives (DQOs) and Measurement Quality Objectives (MQOs) associated with each survey. To ensure that the survey is obtaining the DQOs and MQOs, there are several QA steps built into each survey. Training for all crew members is required before sampling begins. Field evaluations are conducted for all crews to ensure methods are being followed. Each laboratory involved in the sample processing will adhere to the specified laboratory protocols and undergo a thorough and documented quality assurance/quality control (QA/QC) process. Submitted data will undergo a final QC check before analysis begins.

Data Quality Reviews: A peer review and public comment period will be held for each survey. During this time, the draft report will be posted on the web for interested parties to review and submit comments. An independent group of experts will be selected to serve on a peer review panel for the report. In house audits will also be conducted over the course of the survey.

Data Limitations: Because the data are collected in a manner to permit calculations of uncertainty and designed to meet specific Data Quality Objectives (DQOs), the results at the regional level are within about 2-4% of true values dependent upon the specific sample type. Detailed QA/QC checks throughout the survey reduce the data limitations and errors in sampling. The scale of the reporting units is limited by the number of samples taken in a specific region. To make a statistically valid statement about the condition of the resource, sample size should minimally include 30-50 sites per region. Since samples are collected one time at each site per survey, trends analysis will depend on future survey work. Lag time between sample collection and reporting will be between 1-2 years.

Error Estimate: The estimation of condition will vary for the national condition and the regional condition for each survey. The condition estimates are determined from the survey data using cumulative distribution functions and statistically-based uncertainty estimates.

New/Improved Data or Systems: Additional indicators, addressing regional specific needs can be added to the survey over time. QA requirements will be met by all laboratories participating in the surveys. Probabilistic surveys repeated on the same waterbody type utilizing a similar sample design will show condition trends for the resource on a broad geographic scale.

References:

Olsen, A. R. et al. 1999. *Statistical Issues for Monitoring Ecological and Natural Resources in the United States*. Environmental Monitoring and Assessment 54, 1-45

Stevens Jr., D. L. & Urqhart, N. S. 2000. *Response Designs and Support Regions in Sampling Continuous Domains.* Environmetrics 11, 11-41
Stevens Jr., D. L. 1997. Variable Density Grid-based Sampling Designs for Continuous Spatial Populations. Environmetrics 8, 167-195
STORET database website. http://www.epa.gov/STORET/index.html.
U.S. Environmental Protection Agency. 2001. *National Coastal Condition Report*. EPA-620/R-01/005
U.S. Environmental Protection Agency. 2004. *National Coastal Condition Report II*. EPA-620/R-03/002
U.S. Environmental Protection Agency. 2006. Wadeable Streams Assessment. EPA-841-B-06-002 http://www.epa.gov/owow/streamsurvey/

FY 2011 Performance Measures:

- **National Coastal Condition Report (NCCR) score for overall aquatic ecosystem health of coastal waters nationally (1-5 scale) (program assessment long-term outcome measure)**

- **Improve the overall health of coastal waters of the Gulf of Mexico on the "good/fair/poor" scale of the National Coastal Condition Report.**

Performance Database: EMAP/NCA (Environmental Monitoring and Assessment Program/National Coastal Assessment) database (housed EPA/ORD/NHEERL/AED, Narragansett, RI)(Environmental Protection Agency/Office of Research and Development/National Health and Environmental Effects Research Laboratory/Gulf Ecology Division); pre-database information housed in ORD/NHEERL facility in Gulf Breeze, FL (Gulf Ecology Division) (pre-database refers to a temporary storage site for data where they are examined for QA purposes, have appropriate metadata attached and undergo initial statistical analyses); data upon QA acceptance and metadata completion are transferred to EMAP/NCA database and are web available at www.epa.gov/emap/nca. The final data are then migrated to the STORET data warehouse for integration with other water quality data with metadata documenting its quality.

Data Source: Probabilistic surveys of ecological condition completed throughout the Mid- Atlantic and Gulf of Mexico by EPA's Office of Research and Development (ORD) in 1991-1994, in southern Florida in 1995, in the Southeast in 1995-1997, in the Mid-Atlantic in 1997-1998, in each coastal state in 2000-2004 (except Alaska and Hawaii), in Alaska in 2002 and 2004, in Hawaii in 2002 and 2004, and in Puerto Rico in 2000 and 2004, and in other island territories (Guam, American Samoa and U.S. Virgin Islands) in 2004. Surveys collect condition information regarding water quality, sediment quality and biotic condition at 70-100 sites/Region (e.g., mid-Atlantic) each year of collection prior to 1999 and at 35-150 sites in each state or territory/year (site number dependent upon state) after 1999. Additional sampling by the National Estuary Program (NEP) included all individual national estuaries; the total number of sites within NEP boundaries was 30 for the two-year period 2000-2002.

These data are collected through a joint EPA-State cooperative agreement and the States follow a rigid sampling and collection protocol following intensive training by EPA personnel. Laboratory processing is completed at either a state laboratory or through a national EPA contract. Data collection follows a Quality Assurance Project Plan (QAPP) (either the National Coastal QAPP or a variant of it) and QA testing and auditing by EPA.

Methods, Assumptions and Suitability: The surveys are conducted using a probabilistic survey design which allows extrapolation of results to the target population (in this case - all estuarine resources of the specific state.) The collection design maximizes the spatial spread between sites, located by specific latitude-longitude combinations. The survey utilizes an indexed sampling period (generally late summer) to increase the probability of encountering water quality, sediment quality and biotic condition problems, if they exist. Based on the QAPP and field collection manual, a site in a specific state is located by sampling vessel via Global Positioning System (GPS) and water quality is measured on board at multiple depths. Water samples are taken for chemistry; sediment samples are taken for chemistry, toxicity testing and benthic community assessment; and fish trawls are conducted to collect community fish data and provide selected fish (target species) for analysis of whole body and/or fillet contaminant concentrations. Samples are stored in accordance with field manual instructions and shipped to the processing laboratory. Laboratories follow QA plans and complete analyses and provide electronic information to the state or EPA. EPA and the state exchange data to ensure that each has a complete set. EPA analyzes the data to assess Regional conditions, whereas the states analyze the data to assess conditions of state-specific waters. Results of analyses on a national and Regional basis are reported as chapters in the National Coastal Condition Report (NCCR) series. The overall Regional condition index is the simple mean of the five indicators' scores used in the Coastal Condition Report (in the NCCR2 a recalculation method was provided for direct comparison of the successive reports). One of the indicators needs to improve by a full category unit over the eight year period for the Regional estimate to meet the performance measurement goal (+0.2 over an eight year period).

Assumptions: (1) The underlying target population (estuarine resources of the United States) has been correctly identified; (2) GPS is successful; (3) QAPP and field collection manuals are followed; (4) all samples are successfully collected; (5) all analyses are completed in accordance with the QAPP; and (6) all combinations of data into indices are completed in a statistically rigorous manner.

Suitability: By design all data are suitable to be aggregated to the state and Regional level to characterize water quality, sediment quality, and biotic condition. Samples represent "reasonable", site-specific point-in-time data (not primary intention of data use) and an excellent representation of the entire resource (extrapolation to entire resource supportable). The intended use of the data is the characterization of populations and subpopulations of estuarine resources through time. The data meet this expectation and the sampling, response, analysis and reporting designs have been peer reviewed

successfully multiple times. The data are suitable for individual calendar year characterization of condition, comparison of condition across years, and assessment of long-term trends once sufficient data are collected (7-10 years). Data are suitable for use in National Coastal Condition calculations for the United States and its Regions to provide performance measurement information. The first long-term trends analysis appeared in the NCCRIII representing trends between 1990-2002.

QA/QC Procedures: The sampling collection and analysis of samples are controlled by a Quality Assurance Project Plan (QAPP) [EPA 2001] and the National Coastal Assessment Information Management Plan (IMP)[EPA 2001]. These plans are followed by all twenty-three coastal states and 5 island territories. Adherence to the plans are determined by field training (conducted by EPA ORD), field audits (conducted by EPA/ORD), round robin testing of chemistry laboratories (conducted by EPA/ORD), overall systems audits of state programs and national laboratory practices (conducted by EPA), sample splits (sent to reference laboratories), blind samples (using reference materials) and overall information systems audits (conducted by EPA/ORD). Batch sample processing for laboratory analyses requires the inclusion of QA samples in each batch. All states are subject to audits at least once every two years. All participants receive training in year 2000 and retraining sessions are scheduled every two years.

Data Quality Reviews: Data quality reviews have been completed in-house by EPA ORD at the Regional and national level in 2000-2003 (National Coastal Assessment 2000-2003) and by the Office of Environmental Information (OEI) in 2003. No deficiencies were found in the program. A national laboratory used in the program (University of Connecticut) for nutrient chemistry, sediment chemistry and fish tissue chemistry is being evaluated by the Inspector General's Office for potential falsification of laboratory results in connection with other programs not related to NCA. The NCA has conducted its own audit assessment and only one incorrect use of a chemical digestion method for inorganic chemistry samples (metals) was found. This error was corrected and all samples "digested" incorrectly were reanalyzed at no cost.

Data Limitations: Data limitations are few. Because the data are collected in a manner to permit calculation of uncertainty and designed to meet a specific Data Quality Objective (DQO) (<10% error in spatial calculation for each annual state estimate), the results at the Regional level (appropriate for this performance measure) are within about 2- 4% of true values dependent upon the specific sample type. Other limitations as follows: (a) Even though methodology errors are minimized by audits, in the first year of the NCA program (2000) some errors occurred resulting in loss of some data. These problems were corrected in 2001 and no problems have been observed since. (b) In some instances, (<5%) of sample results, QA investigation found irregularities regarding the precision of measurement (e.g., mortality toxicity testing of controls exceeded detection limit, etc.). In these cases, the data were "flagged" so that users are aware of the potential limitations. (c) Because of the sampling/ analysis design, the loss of data at a small scale (~ 10%) does not result in a significant increase in uncertainty in the estimate of condition. Wholesale data losses of multiple indicators throughout the U.S. coastal states and territories would be necessary to invalidate the performance measure. (d) The only

major source of external variability is year-to-year climatic variation (drought vs. wet, major climatic event, etc.) and the only source of internal variation is modification of reporting indicators (e.g., new indices, not a change in data collected and analyzed). This internal reporting modification requires a re-analysis of earlier information to permit direct comparison. (e) There is generally a 2-3 year lag from the time of collection until reporting. Sample analysis generally takes one year and data analysis another. Add another year for report production and peer review. (f) Data collections are completed annually; The EPA/ORD data collection collaboration continued through 2004. Beginning in 2005, ORD began assisting OW, as requested, with expert advice, but discontinued its financial support of the program.

Error Estimate: The estimate of condition (upon which the performance measure is determined) has an annual uncertainty rate of about 2-3% for national condition, about 5-7% for individual Regional indicators (composite of all five states data into a Regional estimate), and about 9-10% for individual state indicators. These condition estimates are determined from the survey data using cumulative distribution functions and the uncertainty estimates are calculated using the Horvitz-Thompson estimator.

New/Improved Data or Systems:

(1) New national contract laboratories have been added every year based on competition. QA requirements are met by the new facilities and rigorous testing at these facilities is completed before sample analysis is initiated. QA adherence and cross-laboratory sample analysis has minimized data variability resulting from new laboratories entering the program.

(2) Data from ORD's National Coastal Assessment Program (NCA) for 2003-2006 will be presented in the NCCRIV. This report is projected to be available at the end ot calendar 2011.

(3) ORD's National Coastal Assessment Program has ended and the Office of Water is now administering the program as part of the National Aquatic Resource Surveys. The next coastal survey is scheduled for summer 2010.

References:

1. Environmental Monitoring and Assessment Database (1990-1998) and National Coastal Assessment Database (2000- 2004) websites: www.epa.gov/emap and www.epa.gov/emap/nca (NCA data for 2000 is only data available at present)
2. National Coastal Assessment. 2000-2003. Various internal memoranda regarding results of QA audits. (Available through John Macauley, National QA Coordinator NCA, USEPA, ORD/NHEERL/GED, 1 Sabine Island, Gulf Breeze, FL 32561)
3. National Coastal Assessment. 2001. Quality Assurance Project Plan. EPA/620/R-01/002.(Available through John Macauley above)

4. National Coastal Assessment. 2001. Information Management Plan. EPA/620/R-01/003 (Available through Stephen Hale, NCA IM Coordinator, ORD/NHEERL/AED, 27 Tarzwell Drive, Narragansett, RI)
5. U.S. Environmental Protection Agency. 2001. National Coastal Condition Report. EPA-620/R- 01/005.
6. U.S. Environmental Protection Agency. 2004. National Coastal Condition Report II. EPA-620/R-03/002.
7. U.S. Environmental Protection Agency 2008. National Coastal Condition Report III. EPA 842-R-08-002.

FY 2011 Performance Measures*:*

- **Number of waterbody segments identified by States in 2002 as not attaining standards, where water quality standards are now fully attained (program assessment long-term and annual measure)**
- **Remove the specific causes of waterbody impairment identified by States in 2002**
- **Improve water quality conditions in impaired watersheds nationwide using the watershed approach**
- **Cost per water segment now fully attaining standards (program assessment annual efficiency)**

Performance Database: The Watershed Assessment Tracking Environmental Results System (WATERS– found at http://www.epa.gov/waters/) is EPA's approach for viewing water quality information related to these measures. WATERS can be used to view information compiled from states' listings of impaired waters as required by Clean Water Act Section 303(d), which are recorded in the Assessment, TMDL Tracking, and Implementation System (ATTAINS). This information (found at http://iaspub.epa.gov/waters10/attains_nation_cy.control?p_report_type=T) is used to generate reports that identify waters that are not meeting water quality standards ("impaired waters") and that need one or more TMDLs to be developed. ATTAINS also includes information on other impaired waters for which TMDLs have been completed. See "New and Improved Data Systems" for more information on the ATTAINS database.

There are several reasons why EPA or states may determine that specific waterbodies listed as impaired in 2002, the baseline year, are no longer impaired in the current reporting year. For example, water quality might improve due to EPA or state actions to reduce point and nonpoint source discharges of pollutants. In other cases, a state or EPA might conduct more robust monitoring studies and use these data to complete more accurate assessments of water quality conditions. In some cases, a state might modify its water quality standards, in accordance with EPA's regulations, to update scientific criteria or to better reflect the highest attainable conditions for its waters. Each of these examples represents a case where an impaired water may no longer exceed water quality standards. Any such removals of waterbody impairments will be recorded based on reports from states scheduled every two years through 2012.

EPA's measure that tracks the improvement of water quality conditions utilizes the information on impairments described above and incorporates two additional features: 12-digit hydrologic unit code (HUC) boundaries and data on "watershed-wide water quality improvement." In 2009 boundaries and data on 12-digit HUC code watersheds were completed, certified and stored on USDA's comprehensive website for HUC watershed information (see http://www.ncgc.nrcs.usda.gov/products/datasets/watershed/index.html). Data on water quality improvements (e.g., a 20% reduction in nitrogen levels) will be documented via the extensive process laid out in computational guidance for this measure and for the measures on water quality standards and waterbody impairment (see http://www.epa.gov/water/waterplan/pamsfy08/def_wq08.html).

Data Source: The primary data source for these measures is state 303(d) lists of their impaired waterbodies needing development of TMDLs, and required submittals of monitoring information pursuant to section 305(b) of the Clean Water Act. These lists/reports are submitted each biennial reporting cycle. Most states have provided this information in Integrated Reports, pursuant to EPA guidance (see "New/Improved Data Systems" below). The baseline for this measure is the derived from the 2002 reporting cycle. States prepare lists/reports using actual water quality monitoring data, probability-based monitoring information, and other existing and readily available information and knowledge the state has, in order to make comprehensive determinations addressing the total extent of the state's waterbody impairments. Once EPA approves a state's 303(d) list, the information is entered into ATTAINS, as described above. Throughout 2006 and 2007, EPA worked with states that did not submit Integrated Reports in 2002 to supplement their 2002 303(d) lists of impaired waters needing TMDLs with waters that were also impaired in 2002 but were not on 303(d) lists because all needed TMDLs were complete. Thus, EPA now has a more complete list of impaired waters for tracking under these measures.

The efficiency measure for the section 106 grant program is derived by dividing the cumulative actual expenditures or President Budget requests for the section 106 grant program, plus state funding matches for these grants (as reported to EPA by the states), by the cumulative number of waterbody segments now fully attaining standards.

Methods, Assumptions, and Suitability: States employ various analytical methods of data collection, compilation, and reporting including: 1) Direct water samples of chemical, physical, and biological parameters; 2) Predictive models of water quality standards attainment; 3) Probabilistic models of pollutant sources; and 4) Compilation of data from volunteer groups, academic interests and others. EPA-supported models include BASINS, QUAL2E, AQUATOX, and CORMIX. Descriptions of these models and instructions for their use can be found at http://www.epa.gov/waterscience/models/. The standard operating procedures and deviations from standard methods for data sampling and prediction processes are stored by many states in the STOrage and RETrieval (STORET) database.

States exercise considerable discretion in using monitoring data and other available information to make decisions about which waters meet their designated uses in accordance with state water quality standards. EPA then aggregates state data to generate national performance measures.

Delays are often encountered in state 303(d) lists and 305(b) submissions, and in EPA's approval of the 303(d) portion of these biennial submissions. EPA encourages states to effectively assess their waters and make all necessary efforts to ensure the timely submittal of required § 303(d) lists of impaired waters. While continuing to strive for 100% on-time list submittals, there was a significant improvement in timely list submissions for the 2008 Integrated Reporting Cycle. EPA will continue to work with states to facilitate accurate, comprehensive, and georeferenced data submissions. Also, EPA is heightening efforts to ensure expeditious review of the 303(d) list submissions with national consistency, and EPA saw dramatic improvements in the average number of days it takes to review State's 303(d) lists for the 2008 Integrated Reporting Cycle.

QA/QC Procedures: QA/QC of data provided by states pursuant to individual state 303(d) lists (under CWA Section 303(d)) and/or Integrated 305(b)/303(d) Reports) is dependent on individual state procedures. EPA regional staff interact with the states during the process of approval of the lists and before the information is entered into the database to ensure the integrity of the data, consistent with the Office of Water Quality Management Plan (QMP). EPA requires that each organization prepare a document called a QMP that: documents the organization's quality policy; describes its quality system; and identifies the environmental programs to which the quality system applies (e.g., those programs involved in the collection or use of environmental data).

Data Quality Review: Recent independent reports have cited that weaknesses in monitoring and reporting of monitoring data undermine EPA's ability to depict the condition of the Nation's waters and to support scientifically sound water program decisions. The most recent reports include the March 15, 2000 Government Accounting Office report *Water Quality: Key Decisions Limited by Inconsistent and Incomplete Data*, *EPA's Draft Report on the Environment*, and the 2007, Office of the Inspector General report, Total Maximum Daily Load Program Needs Better Data and Measures to Demonstrate Environmental Results.

In response to these evaluations, EPA has been working with states and other stakeholders to improve: 1) data coverage, so that state reports reflect the condition of all waters of the state; 2) data consistency to facilitate comparison and aggregation of state data to the national level; and 3) documentation so that data limitations and discrepancies are fully understood by data users.

First, EPA enhanced two existing data management tools (STORET and the National Assessment Database) so that they include documentation of data quality information.

Second, EPA has developed a GIS tool called WATERS that integrates many databases including STORET, ATTAINS, and a water quality standards database. These integrated

databases facilitate comparison and understanding of differences among state standards, monitoring activities, and assessment results.

Third, EPA and states have developed guidance. The 2006 Integrated Report Guidance (released August 3, 2005 at http://www.epa.gov/owow/tmdl/2006IRG) provides comprehensive direction to states on fulfilling reporting requirements of Clean Water Act sections 305(b) and 303(d). EPA also issued a 2010 Integrated Report clarification memo (released May 5, 2009 available at http://www.epa.gov/owow/tmdl/guidance/final52009.html) which includes suggestions for the use of the rotating basin approach and Category 3, circumstances and expectation for "partial approval/further review pending" determinations, and using and reporting on Statewide Statistical Survey Data in ATTAINS And the National Water Quality Inventory Report to Congress.

Also, the *Consolidated Assessment and Listing Methodology – Toward a Compendium of Best Practices* (released on the Web July 31, 2002, at www.epa.gov/owow/monitoring/calm.html~~)~~ intended to facilitate increased consistency in monitoring program design and the data and decision criteria used to support water quality assessments.

Fourth, the Office of Water (OW) and EPA's Regional Offices have developed the *Elements of a State Water Monitoring and Assessment Program*, (March 2008). This guidance describes ten elements that each state water quality monitoring program should contain and directs states to develop monitoring strategies that propose time-frames for implementing all ten elements.

Data Limitations: Data may not precisely represent the extent of impaired waters because states do not employ a monitoring design that monitors all their waters. States, territories and tribes collect data and information on only a portion of their waterbodies. States do not use a consistent suite of water quality indicators to assess attainment of water quality standards. For example, indicators of aquatic life use support range from biological community assessments to levels of dissolved oxygen to concentrations of toxic pollutants. These variations in state practices limit how the CWA Sections 305(b) reports and the 303(d) lists provided by states can be used to describe water quality at the national level. There are also differences among sampling techniques, and standards.

State assessments of water quality may include uncertainties associated with derived or modeled data. Differences in monitoring designs among and within states prevent the agency from aggregating water quality assessments at the national level with known statistical confidence. States, territories, and authorized tribes monitor to identify problems and typically lag times between data collection and reporting can vary by state.

Also, as noted above under Methods, Assumptions and Suitability, states exercise considerable discretion in using monitoring data and other available information to make decisions about which waters meet their designated uses in accordance with state water

quality standards. EPA then aggregates these various state decisions to generate national performance measures.

Error Estimate: No error estimate is available for this data.

New/Improved Data Systems: The Office of Water has been working with states to improve the guidance under which 303(d) lists are prepared. In 2005 EPA issued listing guidance entitled *Guidance for 2006 Assessment, Listing, and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act*. This document provided a comprehensive compilation of relevant guidance EPA had issued to date regarding the Integrated Report. It included some specific changes from the 2004 guidance. For example, the 2006 Integrated Report Guidance provided greater clarity on the content and format of those components of the Integrated Report that are recommended and required under Clean Water Act sections 303(d), 305(b), and 314. The guidance also gave additional clarity and flexibility on reporting alternatives to TMDLs for attaining water quality standards (e.g., utilization of reporting Category 4b).

In October 2006 EPA released *Information Concerning 2008 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions*, 18 months in advance of the April 2008 Integrated Report due date. More than three times the number of states submitted their Integrated Report lists to EPA by the April 1, 2008, deadline compared to 2006. Timely submittal and EPA review of integrated reports is important to demonstrate state and EPA success in accomplishing Strategic Plan goals for water quality. The timelier reporting may be attributed in part to our early issuance of the 2008 Integrated Report Memorandum. EPA recently finished its 2010 Integrated Report Memorandum to promote 100 percent timely 2010 submissions from all 56 states and territories.

EPA has combined the former National TMDL Tracking System and the former National Assessment Database into one integrated system, ATTAINS, which became operational in May 2008. ATTAINS tracks the status of all assessed waters and waterbody impairments, including impaired waterbodies. Also, EPA released the Water Quality Exchange (WQX) which provides data exchange capability to any organization that generates data of documented quality and would like to contribute that data to the national STORET data warehouse so that their data may be used in combination with other sources of data to track improvements in individual watersheds. Currently data providers must transmit data and required documentation through their own Exchange Network node. EPA rolled out a web data entry tool called WQXweb for users who have not invested in the node technology.

References:

USEPA, 2008, *EPA's 2008 Report on the Environment (Final Report)*
http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=190806

USEPA, Office of the Inspector General. 2007. *Total Maximum Daily Load Program Needs Better Data and Measures to Demonstrate Environmental Results.* Available at http://www.epa.gov/oig/reports/2007/20070919-2007-P-00036.pdf.

USEPA, Office of Water. 2006. Information Concerning 2008 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions. Available at http://www.epa.gov/owow/tmdl/2008_ir_memorandum.html,

USEPA, Office of Water. 2005. *Guidance for 2006 Assessment, Listing, and Reporting Requirements Pursuant to Sections 303(d), 305(b), and 314 of the Clean Water Act.* Available at http://www.epa.gov/owow/tmdl/2006IRG.

USEPA, Office of the Chief Financial Officer. 2003. *2003-2008 Strategic Plan: Direction for the Future*. Available at http://www.epa.gov/ocfo/plan/2003sp.pdf.

USEPA. 2003. *Draft Report on the Environment 2003*. EPA 260-R-02-006. Available at http://www.epa.gov/indicators/roe/index.htm.

USEPA, Office of Water. 2003. *Elements of a State Water Monitoring and Assessment Program.* EPA 841-B-03-003. Washington, DC. Available at www.epa.gov/owow/monitoring/elements/.

USEPA. 2002. *Consolidated Assessment and Listing Methodology – Toward a Compendium of Best Practices.* Washington, DC. Available at http://www.epa.gov/owow/monitoring/calm.html.

Government Accountability Office. 2002. *Water Quality: Inconsistent State Approaches Complicate Nation's Efforts to Identify its Most Polluted W*aters. GAO-02-186. Washington, DC.

Government Accountability Office. 2000. *Water Quality: Key EPA and State Decisions Limited by Inconsistent and Incomplete Data*. GAO-RCED-00-54. Washington, DC.

FY 2011 Performance Measures*:*

- **Number of TMDLs that are established or approved by EPA [Total TMDLs] on a schedule consistent with national policy (cumulative) (program assessment measure)**
- **Number of TMDLs that are established by States and approved by EPA [State TMDLs] on schedule consistent with national policy (cumulative) (program assessment measure)**

Note: A TMDL is a technical plan for reducing pollutants in order to attain water quality standards. The terms "approved" and "established" refer to the completion and approval of the TMDL itself.

Performance Database: The Assessment and Total Maximum Daily Load (TMDL) Tracking And ImplementatioN System (ATTAINS) is the database which captures water quality information related to these measures. ATTAINS is an integrated system capable of documenting and managing the connections between state assessment and listing decisions reported under sections 305(b) and 303(d) (i.e., integrated reporting) and completed TMDL information. This system holds information about assessment decisions and restoration actions across reporting cycles and over time until water quality standards are attained. TMDL information (found at http://iaspub.epa.gov/waters10/attains_nation_cy.control?p_report_type=T) is used to generate reports that identify waters for which EPA has approved state-submitted TMDLs and for which EPA has established TMDLs. Annual TMDL totals, spanning 1996 to the present, are available from ATTAINS on a fiscal year basis. As TMDLs and other watershed-related activities are developed and implemented, waterbodies which were once impaired will meet water quality standards. Thus these TMDL measures are closely tied to the program assessment measure, "Number of waterbody segments identified by States in 2002 as not attaining standards, where water quality standards are now fully attained." Newly attaining waterbodies will be removed from the list of impaired water segments.

Data Source: State-submitted and EPA-approved TMDLs and EPA-established TMDLs are the underlying data for these measures. Electronic and hard copies are made available by states and often linked to EPA Web sites. More specifically, the Watershed Assessment, Tracking, and Environmental ResultS system allows search for TMDL documents at http://www.epa.gov/waters/tmdl/tmdl_document_search.html.

Methods, Assumptions, and Suitability: State and EPA TMDLs are thoroughly and publicly reviewed during their development. Upon approval by EPA, relevant information from each TMDL is entered into ATTAINS by EPA Regional staff.

QA/QC Procedures: QA/QC of data is provided by EPA Regional staff and through cross-checks of ATTAINS information regarding impaired water listings, consistent with the Water Quality Management Plan (QMP). EPA requires that organizations prepare a document called a QMP that: documents the organization's quality policy; describes its quality system; and identifies the environmental programs to which the quality system applies (e.g., those programs involved in the collection or use of environmental data).

Data Quality Review: Internal reviews of data quality have revealed some inconsistencies in the methodology of data entry between EPA Regional Offices. In 2005 and 2006, EPA convened a meeting of NTTS users to discuss how to improve the database. As a result, data field definitions were clarified, the users' group was reinstituted, several training sessions were scheduled, and an ATTAINS design team is currently directing the database upgrades. One of the issues raised included the methodology used to count TMDLs. Previous methodology generated a TMDL "count" based on the causes of impairment removed from the 303(d) impaired waters list as well as the TMDL pollutant. EPA proposed to change the counting methodology to directly reflect only the pollutants given allocations in TMDLs. During a recent EPA Office of

the Inspector General review they concurred with this recommendation. This proposed change was vetted during the TMDL Program's annual meeting in March 2007 and implemented in August 2007, resulting in a cumulative net reduction of 1,577 TMDLs. Current realization of targets shows the TMDL Program continues to attain program assessment and Strategic Plan targets despite the adjustment to the counting methodology.

Data Limitations: To meet the increasing need for readily accessible CWA information, EPA continues to improve the database and oversee quality review of existing data. Data quality has been improving and will continue to improve as existing data entry requirements and procedures are being reevaluated and communicated with data entry practitioners.

Error Estimate: No error estimate is currently available for these data.

New/Improved Data Systems: See above.

References:

USEPA, Office of the Inspector General. 2007. *Total Maximum Daily Load Program Needs Better Data and Measures to Demonstrate Environmental Results.* Available at http://www.epa.gov/oig/reports/2007/20070919-2007-P-00036.pdf.

USEPA, Office of the Inspector General. 2005. *Sustained Commitment Needed to Further Advance the Watershed Approach.* Available at http://www.epa.gov/oig/reports/2005/20050921-2005-P-00025.pdf.

National Research Council, Committee to Assess the Scientific Basis of the Total Maximum Daily Load Approach to Water Pollution Reduction. 2001. *Assessing the TMDL Approach to Water Quality Management.* Washington, DC: National Academy Press.

Link to TMDL report data can be found at: http://www.epa.gov/owow/tmdl/

Link to the Watershed Assessment Tracking Environmental Results System (WATERS) can be found at: http://www.epa.gov/waters/tmdl/expert_query.html

FY 2011 Performance Measures:

- **Percentage of major dischargers in Significant Noncompliance at any time during the fiscal year (program assessment measure)**
- **Percentage of all major publicly-owned treatment works (POTWs) that comply with their permitted wastewater discharge standards (program assessment measure)**

Performance Databases: The Permit Compliance System, (PCS) tracks permit compliance and enforcement data for sources permitted under the Clean Water Act

National Pollutant Discharge Elimination System (NPDES). Data in PCS include major permittee self reported data contained in Discharge Monitoring Reports (DMR), data on permittee compliance status, data on state and EPA inspection and enforcement response.

Data Source: Permittee self reported DMR data are entered into PCS by either state or EPA Regional offices. PCS automatically compares the entered DMR data with the pollutant limit parameters specified in the facility NPDES permit. This automated process identifies those facilities which have emitted effluent in excess of permitted levels. Facilities are designated as being in Significant Noncompliance (SNC) when reported effluent exceedances are 20% or more above permitted levels for toxic pollutants and/or 40% or more above permitted levels of conventional pollutants. PCS contains additional data obtained through reports and on-site inspections, which are used to determine SNC, including: non-effluent limit violations such as unauthorized bypasses, unpermitted discharges, and pass through of pollutants which cause water quality or health problems; permit schedule violations; non-submission of DMRs; submission of DMRs 30 or more days late; and violation of state or federal enforcement orders.

Methods, Assumptions and Suitability: There are established computer algorithms to compare DMR effluent data against permitted effluent levels. The algorithms also calculate the degree of permitted effluent exceedance to determine whether toxic/conventional pollutant SNC thresholds have been reached.

QA/QC Procedures: Quality Assurance/Quality Control procedures [See references] are in place for PCS data entry. State and regional PCS data entry staff are required to take PCS training courses [See references]. Quality Management Plans (QMPs) are prepared for each Office within The Office of Enforcement and Compliance Assurance (OECA). The Office of Compliance (OC) has established extensive processes for ensuring timely input, review and certification of PCS information. OC's current QMP, effective for 5 years, was approved July 29, 2003 by the Office of Environmental Information (OEI). The required re-approval of OECA's QMP has been prepared and is in the management approval process at this time.

Data Quality Review: Information contained in PCS is required by policy to be reviewed by regional and headquarters staff for completeness and accuracy. SNC data in PCS are reviewed quarterly.

Data Limitations: Legal requirements for permittees to self report data on compliance with effluent parameters in permits generally results in consistent data quality and accuracy. EPA monitors and measures the timeliness of DMR submissions and data entry quality. National trends over the past several years show an average of 94% of DMRs is entered timely and complete. Where data entry problems are observed, OECA works directly with regions and states to improve performance, and in limited circumstances has dedicated supplemental grant resources to help regions and states correct problems. As part of ICIS-NPDES implementation OECA is working to deploy

an electronic DMR process to save resources on data entry workload and reduce data input errors.

Error Estimate: Not available

New & Improved Data or Systems: PCS was developed during the 1980s and has undergone periodic revision and upgrade since then. OECA is currently developing a modernized data system to replace PCS, utilizing modern data entry, storage, and analytical approaches. The replacement of PCS with ICIS-NPDES (Integrated Compliance Information System – NPDES), a modernized and user-friendly NPDES data system, began in June 2006 when eleven states began using the system; seven other states will be migrated to the new system in August. During phased implementation of ICIS-NPDES across the states a combination of PCS and ICIS-NPDES will be used to generate SNC data. Once fully implemented, ICIS-NPDES will be the sole source of NPDES SNC data.

References:

PCS information is publicly available at:
http://www.epa.gov/compliance/planning/data/water/pcssys.htm

FY 2011 Performance Measures:

- **Percentage of States and Territories that within the preceding three year period submitted new or revised water quality criteria acceptable to EPA that reflect new scientific information from EPA or other sources not considered in the previous standards. (program assessment measure)**
- **Percentage of submissions of new or revised water quality standards from States and Territories that are approved by EPA (program assessment measure)**

Performance Database: The Water Quality Standards Action Tracking Application (WATA), an internal tracking application managed by the Office of Science and Technology described at http://intranet.epa.gov/ost/div/shpd/wata-manual.pdf, is the performance database for these measures. The information in this system provides the baseline and performance data for these measures.

Data Source: The underlying data sources for this measure are submissions from states and territories of water quality standards to EPA pursuant to the Clean Water Act and EPA's water quality standards regulation at 40 CFR Part 131. States and territories are required to review their water quality standards at least once every three years and submit any new or revised water quality standards to EPA for review and approval. Each submission is accompanied by a letter from an appropriate official, and includes a certification by the state or territorial attorney general that the standards were duly adopted pursuant to state or territorial law.

EPA Regional Office staff members compile information from each submission and enter it into the WATA system. The information includes identifying data (name of jurisdiction, date of submission), data concerning components of the submission, and data concerning EPA's action on the submission. EPA has delegated approval and disapproval decisions to the Regional Administrator; the Regional Administrator may re-delegate the decisions to the appropriate Division Director, but no further. Approval decisions are judicially reviewable, and are accompanied by an appropriate administrative record.

Methods and Assumptions:

The Office of Science and Technology has established computation metrics in the Water Quality Standards Action Tracking Application (WATA) system to produce the baselines and performance data for both measures. These metrics are as follows:

- Percentage of State and Territorial water quality standards submissions (received in the 12 month period ending April 30th of the fiscal year) that are approved by EPA. Partial approvals receive fractional credit.

This metric considers all new or revised submissions from May 1 of the previous year through April 30 of the current year. This reporting period provides EPA Regional Offices at least five months to reach and document a valid approval decision. EPA management believes this is an adequate time for processing most submissions. A "submission" is determined by the submitting jurisdiction, as described above. The metric then searches for whether the Regional Office has made any approval decision concerning the submission. If EPA approves the submission in full by the end of the reporting period, it will be counted with an approval value of 1. If EPA disapproves all provisions of the standards, it will be counted with an approval value of 0 (zero). In some cases the Regional decision official may decide to approve some portions of the standards provisions, disapprove some portions, or defer actions on some portions. To accommodate these possibilities, and to reflect the complex nature of some submissions, the WATA system allows Regional staff to track portions of a submission as separate parts with weights corresponding to the number of actual provisions involved. When different decisions are reached on different parts or provisions of a submission, the metric calculates a fractional approval value. The fractional approval value is a number between 0 and 1, equal to the number of provisions approved, divided by the total number of provisions in the original submission. For example, if a submission contains 10 provisions and EPA approves 8 and disapproves 2, then the metric would count this as 0.8 submissions. The final performance metric is the sum of full or fractional approval values divided by the total number of submissions during the reporting period.

- Number of States and Territories that within the preceding three year period submitted new or revised water quality criteria acceptable to EPA that reflect new scientific information from EPA or other sources not considered in the previous standards

This measure utilizes a Regional Office entry in the WATA system which indicates whether a submission or submission part includes one or more new water quality criteria or revised criteria that reflect new scientific information from EPA or other sources not considered in the previous criteria. Biological criteria that are reflected explicitly in designated uses would count under this entry. If a state or territory has not adopted any such criteria, the jurisdiction can nevertheless be counted under this measure if (a) EPA has issued new or revised water quality criteria, including revisions to the published table of EPA recommended criteria at http://www.epa.gov/waterscience/criteria/wqctable, but the state has determined through a scientific assessment that such a change is not relevant for its waters, or (b) the jurisdiction could certify to EPA that it has completed a defensible scientific review of the new scientific information EPA has issued and has determined that no changes are needed to their existing water quality criteria. The metric searches for one or more qualifying submissions or submission parts for each jurisdiction during the three-year period ending five months before the end of the reporting period, and that have been approved by EPA by the end of the reporting period. For example, for FY 2011 any qualifying submissions from May 1, 2008, through April 30, 2011, that were approved by September 30, 2011, would enable the jurisdiction to be counted. Note the overlap from one reporting year to the next: a state that last made such a submittal, in, say, February 2009, could be counted in FYs 2009, FY 2010, and FY 2011 but not in FY 2012.

Suitability: These two performance measures provide important information about how well EPA and states/territories are carrying out their respective roles and responsibilities for establishing and approving up-to-date scientifically defensible WQS. The first measure describes how well EPA and states/territories are working together to set revised WQS that EPA can approve in a timely fashion. The second measure provides an indicator of how well states' WQS reflect latest scientific data.

QA/QC Procedures: States and territories conduct QA/QC of water quality standards submissions pursuant to individual state procedures. Because such submissions are subject to judicial review, the attorney general's certification described above provides assurance of the content of each submission. EPA regional staffs provide support to and interact with the jurisdictions as they develop, review, and adopt water quality standards. Each Regional Office provides data quality review of its entries in the WATA system. For example, Regional Offices generally assure that each entry is reviewed by the water quality standards coordinator, usually a senior scientist or environmental protection specialist with extensive experience in water quality standards actions. Data validation algorithms built into each entry screen also help improve data quality. In addition, a sample of entries is spot-checked by Headquarters' Office of Science and Technology staff. The Regions and Headquarters have been able to conduct the data quality reviews fairly easily because the number of submissions has averaged about 50 to 60 submissions per year in recent years, which is within the range than can be adequately reviewed with available resources.

Data Quality Review: No external reviews of the data have been conducted.

Data Limitations: Submissions may vary considerably in size and complexity. For example, a submission may include statewide water quality standards revisions, use attainability analyses for specific water bodies, site-specific criteria applicable to specific types of waters, general statewide policies, antidegradation policies or procedures, and variances. Therefore, these measures – the number of submissions approved, and the number of jurisdictions with updated scientific information contained in adopted standards – do not provide an indicator of the scope, geographic coverage, policy importance, or other qualitative aspects of water quality standards. This information would need to be obtained in other ways, such as by reviewing the content of adopted and approved standards available at http://www.epa.gov/waterscience/standards/wqslibrary/, or contacting the appropriate Regional Office or state/territorial personnel.

Error Estimate: No error estimate is available for this data.

New/Improved Data Systems: The Office of Science and Technology is continuing to enhance the existing WATA system to improve its capabilities and data quality.

References:

USEPA. May 1, 2009. *Water Quality Standards Acting Tracking Application: Users Guide.* Available at http://intranet.epa.gov/ost/div/shpd/wata-manual.pdf.

USEPA. 2000. *Water Quality Standards Regulation.* Code of Federal Regulations, 40 CFR part 131. Available at http://www.access.gpo.gov/nara/cfr/waisidx_05/40cfr131_05.html.

USEPA. August 1994. *Water Quality Standards Handbook*, 2nd edition. http://www.epa.gov/waterscience/standards/handbook/.

FY 2011 Performance Measure:

- **Estimated annual reduction of nitrogen (millions of pounds), phosphorous (millions of pounds), and sediment (tons) from nonpoint sources to waterbodies. (Section 319 funded projects only.) (program assessment measure)**

Performance Database: The Section 319 Grants Reporting and Tracking System (GRTS) is used by grant recipients (State agencies) to supply information about State NPS Management Programs and annual Section 319 funded work programs, which include watershed-based BMP implementation projects. GRTS includes information about Best Management Practices (BMPs) implemented under 319-funded watershed projects, and the NPS load reductions achieved as a result of implementation. EPA uses GRTS to compile and report information about state section 319 program projects, including load reductions for nitrogen, phosphorus, and sediment.

State reporting via GRTS in part fulfills requirements of the Clean Water Act (CWA) Sections 319(h)(11) and 319(m)(1); however, GRTS also provides EPA and other

stakeholders greater and more efficient access to data, information, and program accomplishments than would otherwise be available. Besides load reduction information, GRTS, in conjunction with WATERS (see below) provides detailed georeferencing (i.e., National Hydrography Dataset – or "NHD"-- reach addresses) for 319-funded projects, project cost information, and a host of other elements.

GRTS is also part of the Watershed Assessment, Tracking, and Environmental Results System (WATERS), which is used to provide water program information and display it spatially using a geographic information system integrated with several existing databases. These databases include the STOrage and RETrieval (STORET) database, the Assessment TMDL Tracking and ImplementatioN System (ATTAINS), the Water Quality Standards Database (WQSDB), and GRTS.

Data Source: States enter load reduction data for individual 319-funded projects into GRTS. Various watershed models are used in the States to estimate the load reductions resulting from implementation of BMPs. Two models used by many states, and directly supported by EPA, are the Spreadsheet Tool for Estimating Pollutant Loads (STEPL) model, and the "Region 5" model. States, at their discretion, may use other models or methods (e.g., AGNPs, SWAT, GWLF, etc), or may use actual water monitoring data to generate estimates of pollutant load reduction resulting from BMP implementation. The load reduction data generated by modeling and/or monitoring efforts are entered by State staff directly into the appropriate GRTS data fields.

Methods, Assumptions and Suitability: States employ two main methods to make pollutant load reduction estimates for the purpose of entering information into GRTS: 1) watershed models to estimate load reductions after watershed project BMPs are implemented, and 2) direct sampling over time of pollutants using targeted site selection. Even direct sampling methods, however, usually involve some type of modeling to separate BMP effects from other variables when determining load reductions.

EPA aggregates the load reduction data entered into GRTS to generate the national load reduction number for each pollutant. In the past, we had to calculate the annual load reduction achieved as an increment from the previous year. With each successive time period – each of which includes load reduction estimates from projects funded under more than one fiscal year grant (since BMPs are still "working" for some time after initial installation) -- the total from the previous period would be subtracted from the total of the current time period to get the incremental total. For example, our first report on national load reduction numbers in the program assessment included projects funded from FY 2002 and most of FY 2003 (FY 2002 was the first grant year for which load reduction information was mandated). For the next report we totaled load reductions for projects from FY 2002 through 2004, with a smattering of projects for FY 2005 for which information was available in GRTS. The total from the first time around was subtracted from this latter total to give us the increment.

In an effort to improve the accuracy of the annual national load reduction amount, we have modified this method of calculating the annual increment. We explicitly instruct the

States to enter their load reduction values within the year they should be reported, and to only enter new (not cumulative) load reduction amounts. Then, because the GRTS can automatically track when the State enters the load reduction in the database, we simply sum the load reductions entered within the reporting timeframes. The user can also make corrections to report the load reductions entered at the wrong time by associating a load reduction date to the value.

QA/QC Procedures: QA/QC of load reduction estimates generated by states is dependent on individual state procedures, such as state Quality Management Plans (QMPs), which are periodically reviewed and approved by EPA Regions.

EPA provides user support and training to states in the use of the STEPL and Region 5 models. EPA emphasizes that Quality Assurance Project Plans (QAPPs) should be developed (in accordance with EPA approved State QMPs) for watershed projects, especially where water quality models are being used or where monitoring is being conducted. EPA also stresses that site-specific parameters be used whenever possible for input to water quality models, as opposed to default input values provided by some modeling tools.

States have continual access and opportunity to review the information in GRTS to ensure it accurately reflects the data they entered (according to their QA procedures). EPA periodically reviews GRTS and reminds states of the critical importance of their completing mandated data elements in a timely, high-quality manner.

Data Quality Review: Data entered in GRTS are periodically reviewed by EPA Regions and Headquarters. Regional personnel also maintain hardcopies of the states work programs, watershed project implementation plans, and Annual Progress Reports. Verification of data in GRTS can be cross-checked with these documents to ensure quality, consistency, and reliability in progress reporting on an incremental (such as, year-to-year) basis, or to note any problems in data quality in GRTS. EPA frequently reviews various aggregation(s) of all the data in GRTS by our use of "ad-hoc" and standard reports available in the GRTS reporting system.

In the past, Nonpoint Source Program reporting under Section 319 had been identified as an Agency-level weakness under the Federal Managers Financial Integrity Act. The Agency's establishment and subsequent enhancements of GRTS has served to mitigate this problem by requiring states to identify the activities and results of projects funded with Section 319(h). In response to the FMFIA evaluation, EPA has been working with states and other stakeholders to improve data input and quality. We sponsor national GRTS-users group meetings each year. These meetings serve not only to meet the training needs of the user community, but also provide a forum for discussing needed enhancements to GRTS. These enhancements range from better capturing environmental results to improving consistency of data entry to facilitate state-by-state comparisons.

The CWA Sections 319(h)(11) and 319(m)(1) require States to report their Nonpoint Source Management Program (NPSMP) milestones, nonpoint source pollutant load

reductions, and water quality improvements. These sections provide the EPA Office of Water (OW) authority to require water quality monitoring and/or modeling, and to require reporting by states to demonstrate their success in reducing nonpoint source pollutant loads and improving water quality. OW has issued several guidance documents designed to improve state NPSMPs, watershed-based projects, and consistency in state progress reporting, including their use of GRTS. In September 2001, EPA issued "Modifications to Nonpoint Source Reporting Requirements for Section 319 Grants." This memorandum outlines the process for reporting in GRTS load reductions for nutrients and sediment (for applicable Section 319(h) funded projects). Our current "National Nonpoint Source Program and Grants Guidelines" (October, 2003) includes sections on all nonpoint source grant reporting requirements, including GRTS reporting. Furthermore, EPA, in consultation with the States, has established the nonpoint source program activity measures (PAMs) -- including nonpoint load reductions -- which are now part of EPA's Strategic Plan. We have also communicated (e.g., via email) to states further detailed explanations of the NPS program activity measures, expected reporting sources and dates, and results of our reviews of data input to GRTS by the States.

Data Limitations: State NPSMP work to model (and monitor) watersheds is often not integrated or coordinated with state water quality monitoring and assessment strategies, and therefore use of the data may be rather limited. Load reduction data are typically generated from the use of water quality models, and there is a great deal of uncertainty in model inputs and outputs. States generally do not apply model results to decision–making for implementing and/or revising their NPS Management Programs.

State assessments of load reductions and water quality typically include uncertainties associated with any measuring or modeling tools. Variability in the environment, as well as in state methods and application of tools limit the accuracy of data for describing load reductions and water quality at the project level. Aggregating the load reduction data up to the national measure compounds the level of uncertainty, thereby preventing the Agency from assigning a reasonable numerical confidence level to it.

Error Estimate: No error estimate is available for these data.

New/Improved Data or Systems: A significant improvement to the GRTS was the conversion from a Lotus Domino system to an Oracle database in 2005. Oracle is the standard database used by Federal agencies. Conversion to Oracle will allow GRTS to seamlessly connect with WATERS, as well as facilitate potential linkages to a variety of other databases, models, and watershed planning tools. The Oracle-based GRTS will greatly improve reporting capabilities for all end users. Reports are easily customized to fit programmatic needs of both State and EPA.

Another focus of improvement has been to simplify the georeferencing process for GRTS users. In 2008, we released a new mapping tool, which makes it much easier for States to geolocate their 319 projects and identify the impacted waterbodies. This tool links to the WATERS database, enabling linkages between 319 projects and other water program features, such as impaired waters. In addition, GRTS users and the public can query for

319 projects using a similar map interface. These improvements in mapping 319 projects have made it easier to answer questions for stakeholders, like "Where are watershed projects being developed and implemented? Are they concurrent with impaired waters and established TMDLs? Do they pursue actions necessary to reduce pollutant loads and attain water quality standards?"

We are also making efforts to ease the data entry burden on the States by offering them the flexibility of entering their data in different formats. States currently have the option to either enter their data over the web using an online form, or directly upload their information into GRTS as an XML file. Many States have expressed interest in using XML but are unfamiliar with the technology. EPA will provide training on XML at our annual User Group Meeting, and through a series of webinars. Also, since most users are familiar with Microsoft Excel, we will develop an Excel template for XML import.

Training on STEPL and the Region 5 model are ongoing in hopes of minimizing operational mistakes for State staff utilizing one or both of these models to estimate section 319 project load reductions.

References: USEPA. *Nonpoint Source Program and Grants Guidelines for States and Territories.* October 23, 2003 (http://www.epa.gov/OWOW/NPS/cwact.html).

USEPA. *Modifications to Nonpoint Source Reporting Requirements for Section 319 Grants*. September 27, 2001 (http://www.epa.gov/OWOW/NPS/cwact.html).

USEPA. GRTS. Grants Tracking and Reporting System. GRTS Web User Guide, Version 1.6 March 15, 2007.

USEPA. WATERS. Watershed Assessment Tracking and Environmental Results. (http://www.epa.gov/waters/).

USEPA. NHDPlus. National Hydrography Dataset Plus (http://www.horizon-systems.com/nhdplus/).

USEPA. STORET. Storage and Retrieval (http://www.epa.gov/storet/dbtop.html).

USEPA. NAD. National Assessment Database (http://www.epa.gov/waters/305b/).

USEPA. WQSDB. Water Quality Standards Database (http://www.epa.gov/wqsdatabase/).

USEPA. STEPL. Spreadsheet Tool for Estimating Pollutant Load (http://it.tetratech-ffx.com/stepl/).

<u>FY 2011 Performance Measures:</u>

- **Percentage of high priority EPA and State NPDES permits that are issued in**

the fiscal year (program assessment measure)

- **Percentage of high priority state NPDES permits that are issued in the fiscal year (program assessment measure)**

Performance Database:

- U.S. EPA. Permit Compliance System (PCS). [database]. Washington, DC [Office of Enforcement and Compliance Assurance]
- U.S. EPA Integrated Compliance Information System (ICIS-NPDES). [database]. Washington, DC [Office of Enforcement and Compliance Assurance]
- Electronic Permit Issuance Forecasting Tool (E-PIFT) [database]. Washington, DC [Office of Water]
- Priority Permits Data Base. [web-based database]. Washington, DC [Office of Water]
- Permit Management Oversight System (PMOS). [web-based database]. Washington, DC [Office of Water]

EPA has carried out detailed permit renewal backlog tracking with PCS data since November 1998. The Permit Compliance System (PCS) and the Integrated Compliance Information System (ICIS-NPDES) are used to determine which individual permits are current through date fields for permit issuance and expiration. To supplement the individual permit data from PCS, EPA uses the Permit Management Oversight System (PMOS) database to track the current or expired status of facilities covered under non-storm water general permits as well as to track issuance of priority permits. Prior to PMOS, the Electronic Permit Issuance Forecasting Tool (E-PIFT) was used to track non-storm water general permit facilities since January 2001.

In March 2004 a new priority permit issuance strategy was initiated under the Permitting for Environmental Results (PER) program. The priority permits issuance strategy focuses permitting activities on environmentally and administratively significant expired permits. The PMOS database is a web-based system that tracks the specific permits that each State and Region has identified as priority. States and Regions enter the permits, and EPA HQ uses PCS/ICIS-NPDES to track permit issuance status of these permits.

Data Source: EPA's Regional offices and NPDES authorized states enter data into PCS and/or ICIS-NPDES, and States and EPA's Regional offices are responsible for entering data into the PMOS. EPA's Regional offices and States also enter permit identification information into the Priority Permits database.

Methods, Assumptions and Suitability: Annually, Office of Wastewater Management (OWM) provides State and Regional authorities with a list of candidate priority permits, defined as permits that have been expired for two years or more. Beginning in FY 2008, States and Regions were permitted to add to this list additional high-priority permits that were expired less than two years or those that would expire within the fiscal year of reporting. States and Regions then use several programmatic and environmental criteria to select which of those candidate permits should be prioritized for issuance. They then

commit to issue a certain number of permits over the next fiscal year. Regions enter their commitments into PMOS. Results are confirmed using PCS/ICIS-NPDES reports.

QA/QC Procedures: The PCS and ICIS-NPDES databases are managed by the Office of Enforcement and Compliance Assurance (OECA); PMOS is a web-based system that is managed by the Office of Water (OW). EPA Headquarters (HQ) staff in OECA review data submitted by states as part of the QA/QC process. In addition, OW continues to work with States and Regions to improve the quality and completeness of the data. EPA generates state-by-state reports that list PCS/ICIS-NPDES "key data" fields, lat/long, and compliance and enforcement data, and provides these lists to NPDES states and Regions for review and cleanup. EPA is providing support to upload these data to PCS.

Data Quality Review: The Office of Inspector General (OIG) has issued several findings regarding poor PCS data quality, and PCS has been listed as an Agency-Level Weakness under the Federal Managers Financial Integrity Act since 1999. This weakness affects EPA's ability to obtain a true picture of the status of the NPDES program. Fortunately, permit event data such as the permit issuance and expiration data needed for this performance measure are generally better populated than other "key" data elements. As noted previously, OW is offering support to States for data upload, data entry, and, if necessary, data compilation to improve data quality. This has resulted in improved tracking of data, particularly industrial permits.

The replacement of PCS with ICIS-NPDES, a modernized and user-friendly NPDES data system, began in June 2006 and twenty-eight states and several territories have successfully migrated to the new system. Use of ICIS-NPDES should greatly increase state participation and data quality. Batch states (those states with their own data systems) will not be migrated to ICIS-NPDES until appropriate mechanisms are in place to transfer the data.

Data Limitations: Priority Permits data are verified and reliable. We are aware of data gaps in PCS in general, particularly for minor facilities, and of discrepancies between state databases and PCS; however, EPA's data clean-up over the past five years has significantly improved data quality. PMOS (and its precursor, E-PIFT) has enabled EPA to report on inventories and status of non-storm water facilities covered by NPDES general permits, but the data are not as comprehensive as those tracked in PCS. In addition, to date, there has been no national-level data system to track permit issuance and expiration status of facilities covered by *stormwater* general permits. In 2008, OWM is planning to improve PMOS to enable tracking of stormwater general permits and facilities covered under them.

Error Estimate: We believe that the permit renewal backlog data for major facilities is accurate within 2 percent based on input from EPA's Regional offices and states through a quarterly independent verification. For minor facilities, however, the confidence interval is less precise and probably overestimates the permit renewal backlog for minor facilities by 5 percent based on anecdotal information from EPA's Regional offices and states.

New/Improved Data or Systems: EPA headquarters has been providing contractor assistance to improve the data quality in PCS and will continue to do so. The new modernized ICIS-NPDES was rolled out in June 2006, with twenty-eight states and several territories now using the system. ICIS –NPDES will be easier to use and will improve the quality of data needed to manage the NPDES program.

References:

Information for PCS and ICIS-NPDES is publicly available at:
http://www.epa.gov/compliance/data/systems/modernization/index.html

FY 2011 Performance Measure:

- **Loading (pounds) of pollutants removed per program dollar expended (program assessment efficiency measure)**

Performance Database: Data for this measure are derived using different methods for industries subject to effluent guidelines, Publicly Owned Treatment Works (POTWs), municipal storm water and construction storm water (industrial storm water is not included nor are reductions from water quality based effluent limits). The values derived from these methods are summed to obtain the total pollutant load reductions achieved under the surface water program.[7]

To calculate the program assessment efficiency measure, the annual[8] cumulative pollutant reductions are divided by the total number of dollars devoted to the EPA Surface Water Program (SWP), grants to States under Clean Water Act (CWA) section 106, plus State 'match' dollars, annually. SWP and CWA Section 106 budget is pulled from EPA's Integrated Financial Management System (IFMS). State 'match' dollars are reported to EPA by States.

Data Sources: For industry sectors subject to **effluent guidelines,** estimated loading reductions are taken from reductions estimated in the Technical Development Document (TDD) when the effluent guideline is developed. The common components for such analyses include wastewater sampling, data collection from the regulated industry, and some amount of estimation or modeling. TDDs are available for: Pulp & Paper, Pharmaceuticals, Landfills, Industrial Waste Combustors, Centralized Waste Treatment, Transportation Equipment Cleaning, Pesticide Manufacturing, Offshore Oil & Gas, Coastal Oil & Gas, Synthetic Based Drilling Fluid, Concentrated Animal Feeding Operations, Meat and Poultry, Metal Products and Machinery, Aquaculture. States and EPA's Regional offices enter data into PCS and ICIS.

---

[7] Beginning in 2008, the values for Phase I municipal stromwater and construction stormwater were added and back-filled to 2002. POTW values were updated and back-filled based on the 2004 CWNS.
[8] The method of calculating the denominator was changed in 2008 to reflect total annual dollars, rather than cumulative dollars.

For **Publicly Owned Treatment Works (POTWs)**, trend data is taken from a detailed analysis for BOD and TSS loadings from POTWs in "Progress in Water Quality: An Evaluation of the National Investment in Municipal Wastewater Treatment," USEPA, June 2000, EPA-832-R-00-008. The report provides flow estimates, loading estimates and a distribution of treatment class for every 2 to 4 years from 1968 through 1996. In addition, the report uses data from the Clean Watershed Needs Survey (CWNS) to provide projections for 2016. EPA has also prepared a "2004 Update to Progress in Water Quality" that uses data from the 2004 CWNS to provide flow and loading estimates for the year 2000 and projections for 2025.

For **Municipal Stormwater,** estimates were derived from EPA models of the volume of storm water discharged from municipal separate storm sewer systems (MS4s) developed as part of a 1997 EPA draft report. The methodology and results of the 1997 draft report are described in "Economic Analysis of the Final Phase II Storm Water Rule", EPA, October 1999.[9]

Estimates of the sediment load present in **Construction Stormwater** is derived using a model developed by the US Army Corps of Engineers. The model uses the construction site version of the Revised Universal Soil Loss Equation (RUSLE). Uncontrolled (i.e. prior to implementation of Best Management Practices (BMPs)) and controlled (i.e. after the implementation of BMPs) sediment loadings were estimated for 15 climatic regions with three site sizes (one, three, and five acres), three soil erodability levels (low, medium, and high), three slopes (3%, 7%, and 12%), and various BMP combinations. The methodology and results are described in "Economic Analysis of the Final Phase II Storm Water Rule." As EPA develops the new Construction and Development Rulemaking, new and better sources of data may be developed that may help to refine this calculation.

Combined Sewer Overflow (CSO) loadings are estimated based on data obtained from the Clean Watershed Needs Survey and from the "Report to Congress on the Impacts and Control of Combined Sewer Overflows and Sanitary Sewer Overflows." States and EPA's Regional offices provide data for the CSO Report to Congress and the Clean Watershed Needs Survey.

Data for the program assessment denominator, i.e. the total number of dollars devoted to the EPA Surface Water Program (SWP), are assembled and updated as new data become available. EPA Surface Water Program funds and CWA Section 106 budget are initially based on the President's Budget until a final budget is adopted; it is then pulled from EPA's Integrated Financial Management System (IFMS). State 'match' dollars are reported to EPA by States; where updated data is not available, the last year of confirmed data is carried forward.

---

[9] Economic Analysis of the Final Phase II Storm Water Rule, Oct. 1, 1999, US EPA. Available at: http://www.epa.gov/npdes or http://cfpub.epa.gov/npdes/pkeyword.cfm?keywords=economic+analysis&program_id=0

Methods, Assumptions and Suitability: EPA uses the spreadsheet described above to estimate loadings. The data are aggregated across different sources to determine loading reductions at the national level. Loadings appear to be the best surrogate for determining the environmental impacts of point sources. Pollutant load reductions, along with some of the water quality improvement measures, tell the story about environmental outcomes. Pollutant reductions per dollar spent provides a snapshot of the effectiveness and efficiency of the surface water program, and comparing this over time helps to delineate a trend.

QA/QC Procedures: The loadings spreadsheets are based on information from rulemakings and policies that have undergone extensive review. The effluent guidelines follow EPA quality assurance/quality control (QA/QC) procedures.

Data Quality Reviews: The methodology for this measure was submitted for review during the program assessment process.

Data Limitations: Loadings data must be modeled rather than measured as there is inconsistent and poor data quality in the PCS data base with respect to flow and discharge monitoring, including missing data for minor facilities which has not been required to be entered. Neither monitoring nor flow data are required for certain categories of general permits. The Agency, therefore, is not able to measure actual loadings reductions for all of the approximately 550,000 facilities that fall under the NPDES program. As a result, loadings estimates are based upon models.

When the ICIS-NPDES Policy Statement is issued, the quality and quantity of Discharge Monitoring Report (DMR) data is expected to improve. This will enable development of improved methods for estimating and validating loading reductions.

Error Estimate: At this time we are unable to estimate error due to the lack of actual national level data to compare to estimates based on models.

New/Improved Data or Systems: EPA continues to evaluate and explore improved methods for calculating loadings reductions nation-wide from all sources.

References:

Clean Watershed Needs Survey 2000 [Electronic data base]. (2000). Washington, D.C. U.S. Environmental Protection Agency [Office of Wastewater Management].

"Economic Analysis of the Final Phase II Storm Water Rule." (1999). Washington, D.C. U.S. Environmental Protection Agency [Office of Wastewater Management]. Available at:
http://cfpub.epa.gov/npdes/pkeyword.cfm?keywords=economic+analysis&program_id=0

Effluent guidelines development documents are available at:
http://www.epa.gov/waterscience/guide.

Modeling databases and software being used by the Office of Water are available at:
http://www.epa.gov/water/soft.html

SWP program assessment Efficiency Measure Spreadsheet [Excel Spreadsheet]. Washington, D.C. U.S. Environmental Protection Agency [Office of Wastewater Management].

FY 2011 Performance Measure:

- **Fund utilization rate for the CWSRF (program assessment annual measure)**
- **CWSRF long-term revolving level**

Performance Database: Clean Water State Revolving Fund National Information Management
System (NIMS.)

Data Sources: Data are from reporting by municipal and other facility operators, state regulatory agency personnel and by EPA's regional staff. Data are collected and reported once yearly.

Methods, Assumptions and Suitability: Data entered into NIMS are the units of performance. These data are suitable for year-to-year comparison and trend indication.

QA/QC Procedures: EPA's headquarters and regional offices are responsible for compiling the data and querying states as needed to assure data validity and conformance with expected trends.
States receive data entry guidance from EPA headquarters in the form of annual memoranda. A generic memorandum would be titled: "Request for Annual Update of Data for the Clean Water State Revolving Fund National Information Management System, July 1, 200X through June 30, 200X."

Data Quality Reviews: EPA's headquarters and regional offices annually review the data submitted by the states. These state data are publicly available at http://www.epa.gov/owm/cwfinance/cwsrf in individual state reports. EPA's headquarters addresses significant data variability issues directly with states or through the appropriate EPA regional office. An annual EPA headquarters' "NIMS Analysis" provides detailed data categorization and comparison. This analysis is used during annual EPA regional office and state reviews to identify potential problems which might affect the performance measure, biennial reviews by EPA's headquarters of regional oversight of state revolving funds and, annual reviews by EPA's regional offices of their states' revolving funds operations.

State data quality is also evaluated during annual audits performed by independent auditors or by the appropriate regional office of the EPA Inspector General. These audits are incorporated into EPA headquarters' financial management system.

Data Limitations: There are no known limitations in the performance data, which states submit voluntarily. Erroneous data can be introduced into the NIMS database by typographic or definitional error. Typographic errors are controlled and corrected through data testing performed by EPA's contractor. Definitional errors due to varying interpretations of information requested for specific data fields have been virtually eliminated as a result of EPA headquarters' clarification of definitions. These definitions are publicly available at: http://www.epa.gov/owm/cwfinance/cwsrf. There is typically a lag of approximately two months from the date EPA asks states to enter their data into the NIMS database, and when the data are quality-checked and available for public use.

Error Estimate: Due to the rapid growth of this program, past estimates of annual performance (relative to a target), compared to actual performance data received two years later, have been accurate to an average of approximately plus or minus2 percentage points.

New/Improved Data or Systems: This system has been operative since 1996. It is updated annually, and data fields are changed or added as needed.

References:
State performance data as shown in NIMS are available by state at:
http://www.epa.gov/owm/cwfinance/cwsrf
Definitions of data requested for each data field in NIMS is available at:
http://www.epa.gov/owm/cwfinance/cwsrf
The Office of Water Quality Management Plan, July 2001 (approved September 28, 2001) addresses the quality of data in NIMS. Not publicly available.

FY 2011 Performance Measures:

- **Number of waterbodies restored or improved per million dollars of CWSRF assistance provided (program assessment efficiency measure)**
- **Number of waterbodies protected per million dollars of CWSRF assistance provided (program assessment efficiency measure)**

Performance Databases: Clean Water State Revolving Fund Benefits Reporting (CBR) Database

CBR contains state-by-state data on the environmental benefits achieved by each loan made by the 51 state CWSRFs. CBR is a new database and therefore does not contain data on all CWSRF loans since the inception of the program. CBR contains complete data on all loans made from capitalization grants received after January 1, 2005. Some states have chosen to report the environmental benefits of loans made from earlier

capitalization grants. Data is entered into CBR by states on a rolling basis; however, states must enter all loans for a given fiscal year by the end of the state fiscal year. As of July 2008, the environmental benefits of $15.8 billion in CWSRF assistance had been reported in the CBR.

CBR contains general information about each loan, including borrower, loan execution date, loan amount, repayment period and interest rate. Data on the environmental benefits of each loan include population served, wastewater volume, needs categories addressed, discharge information (i.e. ocean, surface water, groundwater, etc), permit type/number (if applicable), affected waterbody name and ID number, and affected waterbody status (impaired or meeting standards). CBR also collects information on whether each loan helps a system to achieve or maintain compliance, and whether it contributes to water quality improvement or maintenance. The designated uses of the waterbody are identified, as well as whether the loan contributes to protection or restoration of each designated use.

Data Sources: State regulatory agency personnel report and enter data into the CBR database on a rolling basis, based on state fiscal year.

Methods, Assumptions and Suitability: Data entered into CBR directly represent the units of performance for the performance measure. Data collected in the CBR database is suitable for calculating these performance and efficiency measures.

QA/QC Procedures: EPA regional offices are responsible for assuring state personnel enter all data by the end of the state fiscal year. States receive data entry guidance from EPA headquarters in the form of data definitions, available online at: http://12.170.50.10/cwbenefits/login.aspx by clicking on the "help" menu in the top right corner of the screen.

Data Quality Review: Quarterly checks of the data are performed by EPA's contractor to ensure that states are entering data in a manner consistent with data definitions. Headquarters addresses significant data variability issues directly with states.

Data Limitations: Erroneous data can be introduced into the CBR database by typographic or definitional error. Typographic errors are controlled and corrected through data testing performed by EPA's contractor. Definitional errors due to varying interpretations of information requested for specific data fields are minimized as a result of EPA headquarters' clarification of definitions. Data is entered into the system on a rolling basis due to variations in state fiscal years. This new database has been in operation for approximately one year. As a result, comprehensive data is not available for all states for years prior to 2005.

Error Estimate: As this is a new database, an error estimate is not available at this time.

New & Improved Data or Systems: This system has been operative since 2005. Data fields are changed or added as needed.

References:
Definitions of data requested for each data field in the CBR database are available at: http://12.170.50.10/cwbenefits/login.aspx by clicking on the "help" menu in the top right corner of the screen.

FY 2011 Performance Measures:

- **Percent of serviceable rural Alaska homes with access to drinking water supply and wastewater disposal. (program assessment measure)**
- **Number of homes that received improved service per $1,000,000 of State and Federal funding. (program assessment efficiency measure)**
- **Percent of project federal funds expended on time within the anticipated project construction schedule set forth in the Management Control Policy (program assessment efficiency measure)**
- **Percent of homes on tribal lands lacking access to basic sanitation**
- **Percent of homes on tribal lands lacking access to safe drinking water**
- **Percent of Alaska population served by public drinking water systems in compliance with SDWA regulatory requirements**

Performance Database: Sanitation Tracking and Reporting System (STARS), managed by the Indian Health Service (IHS), Office of Environmental Health and Engineering (OEHE), Division of Sanitation Facilities Construction (DSFC). This database has been modified to include information on water and wastewater projects in rural Alaska communities and Alaska Native Villages (ANVs). This modified database is utilized to establish funding priorities for all federal funds identified for water and wastewater infrastructure in rural Alaska including the ANV program.

Data Sources: The STARS includes data on sanitation deficiencies, Indian homes and construction projects. STARS is currently comprised of two sub-data systems, the Sanitation Deficiency System (SDS) and the Project Data System (PDS).

Methods, Assumptions and Sustainability: The SDS is an inventory of sanitation deficiencies for Indian and rural Alaska homes, ANVs and communities. It is updated annually. The identification of sanitation deficiencies can be made several ways, the most common of which follow:

- Consultation with Tribal members, community members and other Agencies
- Field visits by engineers, sanitarians, Community Health Representatives (CHRs) nurses, State of Alaska IHS or tribal heath staff
- PWSS Sanitary Surveys
- Tribal Master Plans for Development
- Telephone Surveys
- Feasibility Studies

The most reliable and preferred method is a field visit to each community to identify and obtain accurate numbers of homes with sanitation deficiencies. The number of Indian homes within the communities must be consistent among the various methods cited above. If a field visit cannot be made, it is highly recommended that more than one method be used to determine sanitation deficiencies to increase the accuracy and establish greater credibility for the data.

The PDS is a listing of funded construction projects and is used as a management and reporting tool. The PDS supports the annual calculation of the program efficiency measure.

QA/QC Procedures: Quality assurance for the Indian country water quality performance measure depends on the quality of the data in the STARS. The STARS data undergo a series of quality control reviews at various levels within the IHS and the State of Alaska.

Data Quality Reviews: The SDS data undergo a series of highly organized reviews by experienced tribal, IHS field, IHS district, State of Alaska and IHS area personnel. The data quality review consists of performing a number of established data queries and reports, which identify errors and/or inconsistencies. In addition, the top SDS projects and corresponding community deficiency profiles for each area are reviewed against their budgets. Detailed cost estimates are required for the review.

Data Limitations: The data are limited by the accuracy of reported data in STARS.

Error Estimate: The higher-level projects (those with the possibility of funding prior to the next update) must be developed to allow for program implementation in an organized, effective and efficient manner. Those SDS projects (top 20%) must have cost estimates within 10% of the actual costs.

New/Improved Data or Systems: The STARS is a web-based application and therefore allows data to be continuously updated by personnel at various levels and modified as program requirements are identified. PDS has been modified to meet 40CFR31.40 reporting requirements. In 2009 the STARS application will undergo standard ongoing support and updates to maintain database integrity, efficiency, and accuracy.

References:

Indian Health Service (IHS), Division of Sanitation Facilities (DSFC). Criteria for the Sanitation Facilities Construction Program, June 1999, Version 1.02, 3/13/2003.
http://www.dsfc.ihs.gov/Documents/Criteria_March_2003.cfm

Indian Health Service (IHS), Division of Sanitation Facilities (DSFC). Sanitation Deficiency System (SDS), Working Draft, "Guide for Reporting Sanitation Deficiencies for Indian Homes and Communities", May 2003.
http://www.dsfc.ihs.gov/Documents/SDSWorkingDraft2003.pdf

<u>FY 2011 Performance Measure</u>:

- **Percent of active dredged material ocean dumping sites that will have achieved environmentally acceptable conditions (as reflected in each site's management plan and measured through on-site monitoring programs.)**

Performance Database: Data for this measure are entered into EPA's Annual Commitment System (ACS) database by those EPA Regional offices (Regions) responsible for the management and oversight of dredged material ocean dumping sites. This performance measure will be tracked on an annual basis as a management tool for the ocean dumping program.

Data Source: EPA's Regional offices are responsible for data collection and management. Under section 102 of the Marine Protection, Research, and Sanctuaries Act (MPRSA), EPA Regions may designate ocean sites for the disposal of dredged material. The Act requires that each site have a Site Management and Monitoring Plan (SMMP), which includes, but is not limited to, a baseline assessment of the site, a consideration of anticipated use, a monitoring program, and site management conditions or practices that are necessary for protection of the aquatic environment. Each SMMP is unique to the dump site and is developed with the opportunity for stakeholder input. Based on the requirements of each SMMP, the responsible Regions may conduct monitoring surveys of the dump sites to determine benthic impacts, spatial distribution of dredged material, characterize physical changes to the seafloor resulting from disposal, pH, turbidity, and other water quality indicators. Utilizing sampling results (as necessary), EPA Regions determine if a site is achieving environmentally acceptable conditions.

Methods, Assumptions and Suitability: The required monitoring and environmentally acceptable conditions are reflected in the SMMP for each ocean dumping site, as a result the survey/sampling methodologies and assumptions will be site-specific. However, if a Region utilizes EPA's Ocean Survey Vessel (OSV) *Bold*, established procedures for use of the equipment and handling samples on the OSV *Bold* must be followed. In addition, for each survey the Region is required to submit to Headquarters a survey plan that presents types of sampling techniques, including equipment used, and how data are recorded. These data are highly suitable for tracking the performance of this measure, as they are collected for the specific purpose of determining the environmental conditions of the dredged material ocean dump sites. The periodicity of monitoring is determined by the SMMP, and is suitable for tracking this measure.

QA/QC Procedures: Regions must develop a Quality Assurance Project Plan (QAPP), as prescribed by their regional quality assurance procedures, when collecting data at an ocean dumping site. These QAPPs are also submitted to Headquarters when a Region utilizes the OSV *Bold* for a sampling survey. The QAPP outlines the procedures for collection methods, use of analytical equipment, analytical methods, quality control, and documentation and records.

Data Quality Reviews: Regions must conduct data quality reviews as determined by their quality assurance procedures and included in their QAPPs.

Data Limitations: It is still early to determine the full extent of data limitations.

Error Estimate: No error estimate is available for this data.

New/Improved Data or Systems: Reporting in FY 2007 and FY 2008 and FY 2009 did not indicate that any improvements to the collection and/or evaluation of data to support the measure were needed.

References: The Annual Commitment System is an internal EPA database that is a component of the Agency's Budget Automation System (BAS). EPA's Oceans and Coastal Protection Division has prepared a template for the Regions to use when preparing survey plans. QAPPs for those Regions responsible for ocean dumping sites may be found at the following internet sites:
EPA Region 1 - http://www.epa.gov/ne/lab/qa/pdfs/QAPPProgram.pdf
EPA Region 2 - http://www.epa.gov/region2/qa/documents.htm#qag
EPA Region 3 – http://www.epa.gov/quality/qmps.html
EPA Region 4 - http://www.epa.gov/region4/sesd/oqa/r4qmp.html
EPA Region 6 - http://www.epa.gov/earth1r6/6pd/qa/qatools.htm
EPA Region 9 - http://www.epa.gov/region9/qa/pdfs/qaprp_guidance3.pdf
EPA Region 10 - http://www.epa.gov/quality/qs-docs/g5-final.pdf

GOAL 2 OBJECTIVE 3

<u>FY 2011 Performance Measures:</u>

- **Percentage of planned risk management research products delivered to support EPA's Office of Water, Regions, water utilities, and other key stakeholders to manage public health risks associated with exposure to drinking water, implement effective safeguards on the quality and availability of surface and underground sources of drinking water, improve the water infrastructure, and establish health-based measures of program effectiveness. (program assessment measure)**
- **Percentage of planned methodologies, data, and tools delivered in support of EPA's Office of Water and other key stakeholders needs for developing health risk assessments, producing regulatory decisions, implementing new and revised rules, and achieving simultaneous compliance under the Safe Drinking Water Act. (program assessment measure)**
- **Percentage of planned outputs delivered in support of the protection of human health and ecosystems as related to designated uses for aquatic systems and the beneficial use of biosolid long-term goal (program assessment measure)**
- **Percentage of planned outputs delivered in support of the diagnostics and forecasting techniques for the protection of human health and ecosystems as**

related to designated uses for aquatic systems and the beneficial use of biosolids long-term goal (program assessment measure)

- **Percentage of planned outputs delivered in support of the 1) restore impaired aquatic systems, 2) protect unimpaired systems, 3) provide human health risk and treatment process information on the beneficial use of biosolids, and 4) forecast the ecologic, economic, and human health benefits of alternative approaches to attaining water quality standards (program assessment measure)**

Performance Database: Integrated Resources Management System (internal database)

Data Source: Data are generated based on self-assessments of completion of planned program outputs.

Methods, Assumptions and Suitability: To provide an indication of progress towards achievement of a program's long-term goals, each program annually develops a list of key research outputs scheduled for completion by the end of each fiscal year. This list is finalized by the start of the fiscal year, after which no changes are made. The program then tracks quarterly the progress towards completion of these key outputs against pre-determined schedules and milestones. The final score is the percent of key outputs from the original list that are successfully completed on-time.

QA/QC Procedures: Procedures are now in place to require that all annual milestones and outputs be clearly defined and mutually agreed upon within ORD by the start of each fiscal year. Progress toward completing these activities is monitored by ORD management

Data Quality Reviews: N/A

Data Limitations: Data do not capture the quality or impact of the research milestones and outputs being measured. However, long-term performance measures and independent program reviews are used to measure research quality and impact. Additionally, completion rates of research outputs are program-generated, though subject to ORD review.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: Drinking Water Multi-Year Plan, available at: http://epa.gov/osp/myp/dw.pdf (last accessed July 20, 2007).
Water Quality Multi-Year Plan, available at: http://epa.gov/osp/myp/wq.pdf (last accessed July 20, 2007).
Drinking Water Research Program Assessment, available at: http://www.whitehouse.gov/omb/expectmore/summary/10004371.2005.html (last accessed August 16, 2007)

Water Quality Research Program Assessment, available at:
http://www.whitehouse.gov/omb/expectmore/summary/10004306.2006.html
(last accessed August 16, 2007)

FY 2011 Performance Measure:

- **Number of peer-reviewed publications over FTE (efficiency measure)**

Performance Database: No internal tracking system.

Data Source: Data are derived from a self-produced list of program publications and financial records for FTE employees.

Methods, Assumptions and Suitability: The universe of peer-reviewed publications includes 1) journal articles, 2) books and book chapters, and 3) EPA reports, where at least one EPA author is listed or where the publication is the result of an EPA grant. If a publication includes more than one EPA author, that publication is counted only once. Materials submitted for publication but not yet published are not included. FTE are actual program full time equivalents.

QA/QC Procedures: N/A

Data Quality Reviews: All publications included in the data are peer reviewed according to EPA's Peer Review Handbook (3rd Edition).

Data Limitations: FTE data do not include extramurally-funded contributors. Additionally, data do not capture the quality or impact of the research publications. However, long-term performance measures and independent program reviews are used to measure research quality and impact.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: EPA's Peer Review Handbook, available at:
http://www.epa.gov/peerreview/pdfs/Peer%20Review%20HandbookMay06.pdf (last accessed on July 20, 2007)
Water Quality Research Program Assessment, available at:
http://www.whitehouse.gov/omb/expectmore/summary/10004306.2006.html
(last accessed August 16, 2007)

FY 2011 Performance Measure:

- **Percent variance from planned cost and schedule (program assessment efficiency measure)**

Performance Database: Integrated Resources Management System (internal database).

Data Source: Data are generated based on 1) self-assessments of progress toward completing research goals, and 2) spending data.

Methods, Assumptions and Suitability: Using an approach similar to Earned Value Management, the data are calculated by: 1) determining the difference between planned and actual performance for each long-term goal (specifically, determining what percent of planned program outputs were successfully completed on time), 2) determining the difference between planned and actual cost for each long-term goal (specifically, determining the difference between what the program actually spent and what it intended to spent), and 3) dividing the difference between planned and actual performance by the difference between planned and actual cost.

QA/QC Procedures: N/A

Data Quality Reviews: N/A

Data Limitations: Program activity costs are calculated through both actual and estimated costs when activities are shared between programs. Performance data reflects only the key program outputs, and does not include every activity completed by a program. Additionally, completion rates of research outputs are program-generated, though subject to ORD review.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: Water Quality Research Program program Assessment, available at:
http://www.whitehouse.gov/omb/expectmore/summary/10004306.2006.html
(last accessed August 16, 2007)
Drinking Water Research Program Assessment, available
at:http://www.whitehouse.gov/omb/expectmore/detail/10004371.2005.html
(last accessed August 21, 2008)

<u>FY 2011 Performance Measures:</u>

- **Percentage of WQRP program publications rated as highly cited papers (program assessment measure).**
- **Percentage of WQRP publications in high impact journals. (program assessment measure)**

Performance Database: No internal tracking system.

Data Source: Searches of Thomson Scientific's *Web of Science* and *Scopus* are conducted to obtain "times cited" data for programs' publications. Analyses are

completed using Thomson's *Essential Science Indicators (ESI)* and *Journal Citation Reports (JCR)* as benchmarks. *ESI* provides access to a unique and comprehensive compilation of essential science performance statistics and science trends data derived from Thomson's databases.

Methods, Assumptions and Suitability: For influence and impact measures, *ESI* employs both total citation counts by field and cites per paper scores. The former reveals gross influence while the latter shows weighted influence, also called impact. *JCR* is a recognized authority for evaluating journals. It presents quantifiable statistical data that provide a systematic, objective way to evaluate the world's leading journals and their impact and influence in the global research community. The two key measures used in this analysis to assess the journals in which a program's papers are published are the Impact Factor and Immediacy Index. The Impact Factor is a measure of the frequency with which the "average article" in a journal has been cited in a particular year. The Impact Factor helps evaluate a journal's relative importance, especially when compared to other journals in the same field.

QA/QC Procedures: N/A

Data Quality Reviews: N/A

Data Limitations: Analyses do not capture citations within EPA regulations and other key agency documents.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: Bibliometric Analysis for the U.S. Environmental Protection Agency/Office of Research and Development's Water Quality Research Program, available at: http://es.epa.gov/ncer/publications/bibliometrics/wq_bibliometric_2005_021308.html (last accessed on Aug 21, 2008)

GOAL 3 OBJECTIVE 1

<u>FY 2011 Performance Measure</u>:

- **Billions of pounds of municipal solid waste reduced, reused, or recycled (program assessment measure)**

Performance Database: Data are provided by EPA and the Department of Commerce.

Data Source: National estimates for municipal solid waste (MSW) recycling are developed using a materials flow methodology employing data largely from the Department of Commerce and described in the EPA report titled "Characterization of Municipal Solid Waste in the United States." The Department of Commerce collects materials production and consumption data from various industries.

Additional Agency performance data include: total pounds recycled in a year attributable to EPA FTE and contract funds as reported in EPA's Annual Commitment System (ACS), recycling achievements in EPA's recycling partnership programs, as well as the total cost to the Agency including annual recycling dollars, and FTE for HQ and the Regions.

Methods and Assumptions: Data on domestic production of materials and products are compiled using published data series. U.S. Department of Commerce sources are used, where available; but in several instances more detailed information on production of goods by end-use is available from trade associations. The goal is to obtain a consistent historical data series for each product and/or material. Data on average product lifetimes are used to adjust the data series. These estimates and calculations result in material-by-material and product-by product estimates of MSW generation, recovery, and discards.

EPA's 2011 measure focuses on the total pounds of recycling that EPA influences in the United States. EPA helps to increase the amount of materials recycled through its educational materials, technical support, direct assistance, and through recycling partnership programs.

EPA influences national recycling based on its investment, over many years, in the development and implementation of voluntary programs, as well as information tools, to motivate State and local government, business, manufacturers, and citizens to reduce the municipal solid waste generated and increase recycling. The level of national recycling is published biennially in the report "Municipal Solid Waste in the United States." The current report describes the municipal solid waste stream based on data collected yearly from 1960 through 2006.

Many State and local governments, industry and citizen groups use EPA materials to develop their recycling programs. The Agency also has a significant impact on national recycling rates through its participation in major conferences, national and trade press

efforts, and convening summits and focus groups. Additionally, EPA meets with national organizations such as the Association of State and Territorial Solid Waste Management Officials, National Recycling Coalition, and Solid Waste Association of North America to promote recycling.

The second component of the 2011 measure is comprised of EPA's annual commitments as tracked in the ACS database. In addition to efforts in support of the national recycling measure, the Agency will track and report accomplishments based on results achieved from grants, FTE-only opportunities, work assignments (if applicable), and EPA Region-specific partners.

The final component of the 2011 measure is partnership attribution. EPA's WasteWise program provides program design assistance, implementation assistance, networking opportunities, helpline and listserve support, and recognition opportunities to partners enrolled in the program. The cumulative effect and investment in voluntary partnerships contribute to the increase in the national recycling rate. EPA currently claims 25% of recycling and source reduction achievement reported by partners. As part of their enrollment in the WasteWise program, partners submit a baseline waste reduction to use as a point of comparison to measure EPA's influence.

The 2011 MSW measure focuses on EPA costs, both extramural dollars and FTE. By focusing on the Agency's specific contributions to recycling, this will more accurately represent EPA's efficiency.

Suitability: The report, including the baseline numbers, annual rates of recycling and per capita municipal solid waste generation, is widely accepted by solid waste management practitioners.

QA/QC Procedures: Quality assurance and quality control are provided by the Department of Commerce's internal procedures and systems. The report prepared by the Agency, "Characterization of Municipal Solid Waste in the United States," is reviewed by a number of experts for accuracy and soundness.

EPA's budget information and partnership programs data are subject to EPA's QA/QC procedures.

Data Quality Reviews: N/A

Data Limitations: Data limitations stem from the fact that the baseline statistics and annual rates of recycling and per capita municipal solid waste generation are based on a series of models, assumptions, and extrapolations and, as such, are not an empirical accounting of municipal solid waste generated or recycled.

In addition, the measure is contingent upon collection of accurate and up-to-date information from the recycling partnership programs.

Error Estimate: N/A. Currently, the Office of Resource Conservation and Recovery (ORCR) does not collect data on estimated error rates.

New/Improved Data or Systems: The measure represents EPA's accomplishments in promoting recycling.

References:

U.S. Environmental Protection Agency. "Municipal Solid Waste Generation, Recycling and Disposal in the United States: Facts and Figures for 2008," Office of Resource Conservation and Recovery. http://www.epa.gov/osw/nonhaz/municipal/pubs/msw2008rpt.pdf (accessed December 22, 2009).

Waste News. "Municipal Recycling Survey". Crain Communications, Inc. 2009. Available annually from wasterecyclingnews.com. http://www.wasterecyclingnews.com (accessed December 22, 2009)..

U.S. Environmental Protection Agency. "Cutting the Waste Stream in Half: Community Record-Setters Show How". Office of Solid Waste and Emergency Response. EPA-530-F-99-017, October 1999. http://www.epa.gov/osw/conserve/downloads/f99017.pdf (accessed December 22, 2009).

U.S. Environmental Protection Agency. "Evaluation of Diversion and Costs for Select Drop-Off Recycling Programs". Office of Research and Development. EPA-600-R-95-109, June 1995. http://www.epa.gov/nscep (accessed December 22, 2009).

FY 2011 Performance Measure:

- **Number of hazardous waste facilities with new or updated controls. (program assessment measure)**

Performance Database: The Resource Conservation Recovery Act Information System (RCRAInfo) is the national database which supports EPA's RCRA program.

Data Source: Data are mainly entered by the states and can be entered directly into RCRAInfo, although some choose to use a different program and then "translate" the information into RCRAInfo. Supporting documentation and reference materials are maintained in Regional and state files.

Methods and Assumptions: RCRAInfo, the national database which supports EPA's RCRA program, contains information on entities (generically referred to as "handlers") engaged in hazardous waste generation and management activities regulated under the portion of RCRA that provides for regulation of hazardous waste. RCRAInfo has several different modules, including status of RCRA facilities in the RCRA permitting universe.

Suitability: States and EPA's Regional offices generate the data and manage data quality related to timeliness and accuracy. Within RCRAInfo, the application software contains structural controls that promote the correct entry of the high-priority national components. RCRAInfo documentation, which is available to all users on-line at https://rcrainfo.epa.gov/, provides guidance to facilitate the generation and interpretation of data.

QA/QC Procedures: Even with the increasing emphasis on data quality, with roughly 10,000 units in the baseline (e.g., a facility can have more than one unit), we hear of data problems with some facilities every year, particularly with the older inactive facilities. When we hear of these issues, we work with the EPA Regional offices to see that they get resolved. It may be necessary to make a few adjustments as data issues are identified. Determination of whether or not the facility has approved controls in place is based primarily on the legal and operating status codes for each unit. Each year since 1999, in discussions with Regional offices and states, EPA has highlighted the need to keep the data that support the GPRA permitting goal current. RCRAInfo is the sole repository for this information and is a focal point for planning from the local to national level. Accomplishment of updated controls is based on the permit expiration date code and other related codes. We have discussed the need for correct entry with the Regions. The most recent version of RCRAInfo, Version 4 (V4), has many added components that will help the user identify errors in the system (Example: data gap report).

Note: Access to RCRAInfo is open only to EPA Headquarters, Regional, and authorized state personnel. It is not available to the general public because the system contains enforcement sensitive data. The general public is referred to EPA's Envirofacts Data Warehouse to obtain information on RCRA-regulated hazardous waste sites. This non-sensitive information is supplied from RCRAInfo to Envirofacts.

Data Quality Reviews: The 1995 GAO report *Hazardous Waste: Benefits of EPA's Information*
System Are Limited (AIMD-95-167, August 22, 1995,
http://www.gao.gov/archive/1995/ai95167.pdf) on EPA's Hazardous Waste Information System reviewed whether national RCRA information systems support EPA and the states in managing their hazardous waste programs. Those recommendations coincided with ongoing internal efforts to improve the definitions of data collected, and ensure that data collected provide critical information and minimize the burden on states. RCRAInfo, the current national database, has evolved in part as a response to this report. The "Permitting and Corrective Action Program Area Analysis" was the primary vehicle for the improvements made in the December 2008 release (V4).

Data Limitations: The authorized states have ownership of their data and EPA has to rely on them to make changes. The data that determine if a facility has met its permit requirements are prioritized in update efforts. Basic site data may become out-of-date because RCRA does not mandate the notification of all information changes. Nevertheless, EPA tracks the facilities by their ID numbers and those should not change even during ownership changes (*RCRA Subtitle C*

EPA Identification Number, Site Status, and Site Tracking Guidance, March 21, 2005). The baselines are composed of facilities that can have multiple units. These units may consolidate, split or undergo other activities that cause the number of units to change. We aim to have a static baseline for the total facilities tracked for GPRA, but there may be occasions where we would need to make minor baseline modifications. The larger permitting universe is carried over from one Strategic Plan to the next with minor changes (for instance, facilities referred to Superfund are removed, or facilities never regulated are removed; facilities that applied for a permit within the last strategic cycle are added). This universe is composed of facilities that were subject to permits as of 10-1-1997 and subsequent years. EPA plans to update the list of units that need "updated controls" after the end of each Strategic Plan cycle. Those facilities that need updated controls are a smaller set within the larger GPRA permitting universe tracked for strategic and annual goals.

Error Estimate: N/A. Currently ORCR does not collect data on estimated error rates.

New/Improved Data or Systems: New data quality tools, tracking, and reporting capabilities were added with V4 of RCRAInfo, deployed in December 2008. RCRAInfo allows for tracking of information on the regulated universe of RCRA hazardous waste handlers, such as facility status, regulated activities, and compliance history. The system also captures detailed data on the generation of hazardous waste by large quantity generators and on waste management practices from treatment, storage, and disposal facilities. RCRAInfo is web accessible, providing a convenient user interface for Federal, state and local managers, encouraging development of in-house expertise for controlled cost, and states have the option to use commercial off-the-shelf software to develop reports from database tables.

References:

U.S. Environmental Protection Agency. Office of Resource Conservation and Recovery. RCRAInfo website with documentation and data http://www.epa.gov/enviro/html/rcris/index.html (accessed December 22, 2009).

U.S. Government Accountability Office. "Hazardous Waste: Benefits of EPA's Information System Are Limited". AIMD-95-167, August 22, 1995. http://www.gao.gov/archive/1995/ai95167.pdf (accessed December 22, 2009).

U.S. Environmental Protection Agency. "Permitting and Corrective Action Program Area Analysis". WIN/INFORMED Executive Steering Committee, July 28, 2005.

U.S. Environmental Protection Agency. "RCRA Subtitle C EPA Identification Number, Site Status, and Site Tracking Guidance". March 21, 2005

<u>FY 2011 Performance Measures</u>:

- **Minimize the number of confirmed releases at UST facilities to 9,000 or fewer each year**

- **Increase the percentage of UST facilities that are in significant operational compliance (SOC) with both release detection and release prevention requirements by 0.5% over the previous year's target**
- **Number of annual confirmed UST releases per Federal, state, and territorial costs (program assessment efficiency measure)**

Performance Database: Designated state agencies individually maintain records for reporting state program accomplishments. A new oracle web-based system is being developed, in conjunction with OSWER's Performance Assessment Tool, for the regions, states and territories to enter their data for these performance measures.

Data Source: The data suppliers are the states and territories who sign Leaking Underground Storage Tank (LUST) prevention assistance agreements and State and Tribal Assistance Grants with EPA. Each EPA regional office manages their own states' assistance agreements. Designated state agencies submit semi-annual progress reports to the EPA Regional offices. For the Program Assessment Efficiency Performance Measure, OUST will estimate the value of this efficiency measure based on data that EPA and state agencies currently collect and maintain. The data includes the states' semi-annual activity reports, which track the number of releases confirmed each year and the number of active underground storage tanks; funding for leak prevention and matching expenditure of 25 percent for every dollar of leak prevention funding the states receive; and EPA's prevention program administration costs, such as salary, travel expenses, contracts and working capital funds.

Methods, Assumptions and Suitability: N/A

QA/QC Procedures: EPA/OUST will oversee the use of the QA/QC checklist, which identifies the QA/QC process that regional program managers should follow for each state's data submission. Regions complete the QA/QC checklist, sign it and submit it to EPA/OUST. The QA/QC checklist will be incorporated into the web-based system.

Data Quality Review: EPA's regional grants project officers and program managers provide first-level data quality reviews and oversight of the recipients' program performance measure results. EPA/OUST provides second-level data quality reviews of all data.

Data Limitations: For the semi-annual activity report, percentages reported are sometimes based on estimates and extrapolations from sample data. Data quality depends on the accuracy and completeness of state records.

Error Estimate: N/A

New/Improved Data or Systems: None.

References: *Semi-annual Report of UST Performance Measures, End of Fiscal Year 2009 – as of September 30, 2009, dated December 2009*, http://www.epa.gov/OUST/cat/ca_09_34.pdf. (accessed December 29, 2009)

FY 2011 Performance Measure:

- **Increase in the percentage of coal combustion product ash that is used instead of disposed**

Performance Database: Data to support this measure are provided by the Department of Energy and American Coal Ash Association (ACAA). EPA collects data on generation of materials (Toxic Release Inventory), but it does not maintain a database for utilization.

Data Source: The ACAA conducts an annual voluntary survey on coal combustion products (CCP) generation and recycling practices of the utility industry. Responders typically represent approximately 35-50% of the electricity generating capacity of the United States. The ACAA survey information is compared to the other sources of utilization data, including the Department of Energy's Energy Information Agency (EIA) Form 923 (Formerly 767) and other publicly available trade association data.

Methods and Assumptions: The reporting of utilization data is voluntary and requires extrapolation and integration with several sources of data. TRI data does not track end-use and does not require reporting of materials by their utilization.

Suitability: The coal combustion product recycling rate is defined as tons of CCPs recycled divided by tons of CCPs generated nationally by coal-fired electric utilities. The goal is to obtain a consistent historical data series for the generation and use of CCPSs. These data are essential to evaluate the effectiveness of beneficial use programs and activities.

QA/QC Procedures: Quality assurance and quality control for production numbers reported on EIA 923 are provided by the Department of Energy's internal procedures and systems. Data on utilization are reviewed by EPA and CCP industry experts for accuracy.

Data Quality Reviews: N/A

Data Limitations: The ACAA annual survey data are considered to be of good to excellent quality on the national level. While the ACAA survey is voluntary and covers only a portion of the industry, the DOE data enable accurate extrapolation based on well characterized electricity generating capacity. Data limitations are associated with some States and regions which may be under-represented in the survey.

Error Estimate: N/A. Currently, the Office of Resource Conservation and Recovery (ORCR) does not collect data on estimated error rates.

New/Improved Data or Systems: The current DOE Form 923 replaced the Form 767 in 2007, which necessitated adjustments in completing the ACAA survey. The ACAA survey data are now considered consistent with past years. No new data sources or collection practices are contemplated at this time.

References: American Coal Ash Association. "ACAA 2008 CCP Survey 2009." http://www.acaa-usa.org/ (accessed December 22, 2009).

FY 2011 Performance Measure:

- **Number of facilities with new or updated controls per million dollars of program cost (program assessment efficiency measure)**

Performance Database: The Resource Conservation Recovery Act Information System (RCRAInfo) is the national database which supports EPA's RCRA program and provides information on facilities under control.

Costs by the permittee are estimated through the annual cost estimates contained in the Information Collection Requests (ICR) supporting statements relevant to the RCRA Base Program. ICRs are contained in the Federal Docket Management System. Base program appropriation information is maintained in the Budget Automation System (BAS).

Data Source: The Office of Resource Conservation and Recovery (ORCR) develops ICRs and ensures they have active ICRs approved by the OMB for all of their RCRA permitting and base program information collection activities. BAS automates EPA's budget processes, including planning, budgeting, execution, and reporting. Budget data is entered at a general level by offices and regions or by the Office of the Chief Financial Officer (OCFO).

Methods and Assumptions:

Numerator – Facilities with approved or updated controls as described above; facilities under control is an outcome based measure as permits or similar mechanisms are not issued until facilities have met standards or permit conditions that are based on human health or environmental standards. Examples include sites cleaned up to a protective level; any groundwater releases controlled so no further attenuation is occurring; any remaining waste safely removed or capped (isolated); and long term controls in place to protect people and the environment at the site, if any contamination remains. An updated control, such as a permit renewal, indicates that the facility has upgraded its operations to ensure continued safe operation, minimizing the potential for releases and accidents.

Denominator – The denominator is the sum of two costs. The first is permitting costs based on Information Collection Requests for the base RCRA program. The costs will take into account recent rulemakings which impact program expenditures

The second program cost in the denominator is the input of a three year rolling average appropriation for Environmental Programs and Management (EPM) and State and Tribal Assitance Grant (STAG) program. Corrective action programs costs will not be included but will be addressed in a separate efficiency measure. A rolling average of appropriations is more appropriate since some of the facility controls depend upon past resources. Issuance time for a permit, for example, can exceed one year with public hearings and appeals. The cumulative number of facilities with controls in place is appropriate (rather than a single year's increment) because the appropriations are used to maintain facilities that already have controls in place (e.g. inspections and permit renewals) as well as to extend the number of facilities with controls.

Suitability: EPA's BAS is the primary source for budget formulation data and is considered definitive for all Agency users. RCRAInfo is also considered to be a definitive source of RCRA facility information, and much of the data contained in RCRAInfo is available nowhere else. The data are considered accurate at the regional and national levels.

QA/QC Procedures: QA/QC of the ICR costs is based on internal and external review of the data**.** BAS data undergoes quality assurance and data quality review through the Chief Financial Officer.

Data Quality Reviews: N/A.

Data Limitations: The data sources for the program costs identified in the denominator of the measure include all of the RCRA base program appropriations (e.g. RCRA Subtitle D program implementation) and not just costs for permitting. Accordingly, the measure cannot be compared with other similar government programs.

Error Estimate: N/A. Currently ORCR does not collect data on estimated error rates.

New/Improved Data or Systems: No new efforts to improve the data or methodology have been identified.

References: U.S. Environmental Protection Agency. Office of Environmental Information. Federal Docket Management System (FDMS). http://www.regulations.gov (accessed December 22, 2009).

U.S. Environmental Protection Agency. Office of the Chief Financial Officer. Budget Automation System. Internal agency operating system on EPA intranet, (accessed December 22, 2009).

<u>FY 2011 Performance Measure</u>:

- **Number of tribes covered by an integrated solid waste management plan**

Performance Database: EPA Regions have internal data systems which are appropriate for the size of the data set. As of October 2009, a nationwide total of 94 tribal integrated waste management plans have been counted in EPA's Annual Commitment System.

Data Source: EPA Regional offices enter data into their internal data systems.

Methods and Assumptions: Regional data systems reflect EPA Regional offices' evaluations of tribal integrated waste management plans and do not require any other data elements or sources. The data systems are considered to be appropriate for the minimal complexity and small size of the data set.

Suitability: The data are reviewed by EPA for data quality and periodic adjustments are made during these reviews. The data are considered to be accurate on a regional and national scale.

QA/QC: The internal EPA data set housing the specific solid waste management plans for each tribe is managed by each regional office and is under the control of each region. Also, because the data are very small in size on a region by region basis, it can be managed efficiently by each regional office and is considered to be accurate.

Data Quality Reviews: N/A.

Data Limitations: EPA Regions have ownership of this data. There are no other limitations.

Error Estimate: N/A.

New/Improved Data or Systems: During FY 2011, EPA will be compiling the regional data into a spreadsheet for national tracking purposes.

References: U.S. Environmental Protection Agency. "Five Elements of a Tribal Integrated Waste Management Plan". Memorandum from Matt Hale, Director, Office of Solid Waste.
http://yosemite.epa.gov/osw/rcra.nsf/0c994248c239947e85256d090071175f/E7661F353791AD71852573780050876E/$file/14776.pdf (accessed December 14, 2009).

<u>FY 2011 Performance Measure</u>:

- **Number of closed, cleaned up or upgraded dumps in Indian Country or other tribal lands**

Performance Database: Indian Health Service's Web Sanitation Tracking and Reporting System (w/STARS) database. This database is a subset of the Operation and Maintenance Data System (OMDS).

Data Source: EPA's Regional offices, in collaboration with IHS, report the performance data continually to the w/STARS database. The database is restricted to personnel who have specific passwords.

Methods and Assumptions: The w/STARS database contains information regarding the location, composition, use status, proximity to population, and other related dump data. Reports generated for EPA from the database focus on the status of the open dumps.

Suitability: The data are reviewed by the EPA and IHS for data quality. The data are considered to be accurate on a national scale.

QA/QC Procedures: Quality assurance and quality control relate to internal procedures for the IHS w/STARS reporting process. Access to the data system is restricted to password holders. Data generated by tribal government staff is verified and then entered by EPA or IHS staff.

Data Quality Review: N/A.

Data Limitations: The w/STARS database contains data pertaining to the open dumps located on the lands of the 572 federal recognized tribes. EPA is aware that new open dumps may be created on these lands. While EPA has access to the database, IHS has ownership of the database.

Error Estimate: N/A. Currently, the Office of Resource Conservation and Recovery (ORCR) does not collect data on estimated error rates.

New/Improved Data or Systems: EPA Regional offices and IHS staff are in the process of a significant data collection effort to update the universe of known open dumps. The initial data collection was completed in December 2009. During the past several years, IHS, in collaboration with EPA, customized the w/STARS database to better meet EPA needs and requirements. This effort is currently ongoing.

References: U.S. Department of Health and Human Services. Indian Health Service. w/STARS data are available from the IHS website, http://www.ihs.gov (accessed December 14, 2009).

GOAL 3 OBJECTIVE 2

FY 2011 Performance Measures:

- **Percent of all SPCC facilities found to be non-compliant which will be brought into compliance (program assessment measure)**
- **Percent of all FRP facilities found to be non-compliant which will be brought into compliance (program assessment measure)**

- **Gallons of oil spilled to navigable waters per million program dollars spent annually on prevention and preparedness at Facility Response Plan (FRP) facilities (program efficiency measure)**

Performance Database: The EPA Annual Commitment System (ACS) in BAS is the database for the number of inspections/exercises at SPCC and FRP facilities. Using data submitted directly by Regional staff as well as data in ACS, Office of Emergency Management (OEM) tracks in a spreadsheet national information about Regional activities at FRP facilities. Data about gallons of oil spilled are maintained in a National Response Center (NRC) database that reflects information reported to the NRC by those responsible for individual oil spills. Prevention and preparedness expenditures are tracked in the Agency's financial database. EPA will also be using its in-house SPCC/FRP Database to pull data related to inspected facilities to assist measurement tracking.

Data Source: Data concerning inspections/exercises at FRP and SPCC facilities are provided by Regional staff. Data concerning gallons of oil spilled to navigable waters are gathered from the publicly available National Response Center database. Data about program expenditures are extracted by EPA HQ from the Agency's financial database.

Methods and Assumptions: The spill/exercise data are entered by Regional staff experienced in data entry. In every case, direct data (rather than surrogates open to interpretation) are entered. The assumption for the oil program's compliance measures is that the universe will consist of all facilities that were found to be non-compliant during the course of the year. Each year thereafter, this number and the number of facilities that were brought into compliance will be determined on a cumulative basis, and the percentage calculated accordingly. The baseline for these new measures will be established during FY 2009.

Suitability: For the new Strategic Plan, EPA is proposing a focus on bringing SPCC and FRP facilities into compliance. This will necessitate national consistency in targeting inspections as well as the process to bring non-compliant facilities into compliance.

QA/QC Procedures: Data are regularly compared to similar data from the past to identify potential errors.

Data Quality Reviews: EPA regularly reviews recent data, comparing them to data gathered in the past at similar times of year and in the same Regions. Any questionable data are verified by direct contact with the Regional staff responsible for providing the data.

Data Limitations: The NRC data will reflect the extent to which those responsible for oil spills accurately report them to the NRC.

Error Estimate: Data reported by the Regions should be relatively free of error. There may be some error in the NRC data, due to the fact that some spills might not be reported

and/or some spills might be reported by more than one person. NRC and EPA procedures should identify multiple reports of the same spill, but it is not usually possible to identify an unreported spill.

New/Improved Data or Systems: There are no current plans to develop a dedicated system, to manage the various data.

References: For additional information on the Oil program, see www.epa.gov/oilspill

FY 2011 Performance Measure:

- **Score on Core NAR evaluation**

Performance Database: No specific database has been developed. Data from evaluations from each of the 10 Regions, Special Teams, and Headquarters are tabulated and stored using standard software (e.g., Word, Excel).

Data Source: The Core National Approach to Response (NAR) measures EPA's readiness for multiple significant events. Data are collected through detailed surveys of all Regional programs, EPA special teams and HQ offices. The process will include interviews with personnel and managers in each program office.

While EPA is currently prepared to respond to chemical, biological, and radiological incidents, improvement in the homeland security readiness measure will demonstrate an increased ability to respond quickly and effectively to national-scale events. The FY 2010 Core NAR target is to improve homeland security readiness by 5 points from the FY 2009 baseline performance.

Methods, Assumptions and Suitability: To ensure that the goals of the NAR are being met, EPA has developed a Core NAR evaluation. (The National Approach to Response is an Agency wide mechanism to address effective evaluation of resources.) The Core NAR evaluation criteria measures the Agency's readiness to respond to multiple, nationally significant events. EPA Headquarters, Regions, and Special Teams are evaluated during this process. The evaluation team consists of managers and staff from Headquarters, including contractor support. Once all of the evaluations are complete, a national score will be calculated based on average scores.

QA/QC Procedures: To be developed

Data Quality Review: The evaluation team will review the data (see Methods and Assumptions) during the data collection and analysis process. Additional data review will be conducted after the data have been analyzed to ensure that the scores are consistent with the data and program information. There currently is no specific database that has been developed to collect, store, and manage the data.

Data Limitations: One key limitation of the data is the lack of a dedicated database system to collect and manage the data. Standard software packages (word processing, spreadsheets) are used to develop the evaluation criteria, collect the data, and develop the accompanying readiness scores. There is also the possibility of subjective interpretation of data.

Error Estimate: It is likely that the error estimate for this measure will be small for the following reasons: the standards and evaluation criteria have been developed and reviewed extensively by Headquarters and EPA's Regional managers and staff; the data will be collected by a combination of managers and staff to provide consistency across all reviews plus an important element of objectivity in each review; the scores will be developed by a team looking across all ten Regions, Special Teams, and Headquarters, allowing for easier cross-checking and ensuring better consistency of data analysis and identification of data quality gaps.

New/Improved Data or Systems: There are no current plans to develop a dedicated system to manage the data.

References: None.

<u>FY 2011 Performance Measures</u>:

- **Number of Superfund final assessment decisions completed (program assessment measure)**
- **Number of Superfund sites with human exposures under control (program assessment measure)**
- **Number of Superfund sites with groundwater migration under control (program assessment measure)**
- **Annual number of Superfund sites with remedy construction completed (program assessment measure)**
- **Number of Superfund sites Ready for Anticipated Use Site-Wide.**
- **Human exposures under control per million dollars (program assessment efficiency measure)**
- **Annual program dollars expended per Operable Unit (OU) completing cleanup activities (Federal Facilities program assessment efficiency measure)**
- **PRP removal completions (including voluntary, AOC and UAO actions) overseen by EPA. (program assessment measure)**
- **Superfund-lead removal actions completed annually (program assessment measure)**
- **Number of Federal Facility Superfund sites where all remedies have completed construction (program assessment measure)**
- **Number of Federal Facility Superfund sites where the final remedial decision for contaminants at the site has been determined (program assessment measure)**
- **Number of Remedial Action Project Completions at Superfund NPL Sites**

Performance Database: The Comprehensive Environmental Response, Compensation, and Liability System (CERCLIS) is used by the Agency to track, store, and report Superfund site information.

Data Source: CERCLIS is an automated EPA system; headquarters and EPA's Regional offices enter data into CERCLIS on a rolling basis. The Integrated Financial Management System (IFMS) is EPA's core financial management system.

Methods and Assumptions: Except for financial information, each performance measure is a specific variable entered into CERCLIS following specific coding guidance and corresponding supporting site-specific documentation.

IFMS contains records of all financial transactions (e.g., personnel, contracts, grants, other) of Superfund appropriation resources, as distinguished by U.S. Treasury schedule codes. The Site/Project field of the IFMS account number that is assigned to every financial transaction identifies site-specific obligations. Total annual obligations include current and prior year appropriated resources, excluding Office of Inspector General (OIG) and Science and Technology transfers. Site-specific obligation data are derived using query logic that evaluates the Site/Project field of the IFMS account number.

"Projects" represent discrete actions taken to implement a site cleanup remedy as described in the Record of Decision. They are typically defined to address discrete problems, such as specific media (e.g., ground water contamination), areas of a site (e.g., discrete areas of contamination), or particular technologies (e.g., soil vapor extraction). A given remedy may contain multiple actions or projects depending on the nature of the remedy selected

Suitability: The Superfund Program's performance measures for FY 2011 are used to demonstrate program progress and reflect major site cleanup milestones from start (Final Assessment Decision) to finish (Percentage of Sites Ready for Anticipated Use). Each measure marks a significant step in ensuring human health and environment protection at Superfund sites. OMB has accepted these measures for monitoring program performance on an annual basis.

QA/QC Procedures: To ensure data accuracy and control, the following administrative controls are in place: 1) Superfund Program Implementation Manual (SPIM), the program management manual that details what data must be reported; 2) Report Specifications, which are published for each report detailing how reported data are calculated; 3) Coding Guide, which contains technical instructions to data users including Regional Information Management Coordinators (IMCs), program personnel, data owners, and data entry personnel; 4) Quick Reference Guides (QRG), which are available in the CERCLIS Documents Database and provide detailed instructions on data entry for nearly every module in CERCLIS; 5) Superfund Comprehensive Accomplishment (SCAP) Reports within CERCLIS, which serve as a means to track, budget, plan, and evaluate progress towards meeting Superfund targets and measures; 6) a historical lockout feature in CERCLIS so that changes in past fiscal year data can be changed only

by approved and designated personnel and are logged to a Change Log report, 7) the Office of Solid Waste and Emergency Response (OSWER) Quality Management Plan; and 8) Regional Data Entry Control Plans. Specific direction for these controls is contained in the Superfund Program Implementation Manual (SPIM).

CERCLIS operation and further development is taking place under the following administrative control quality assurance procedures: 1) Office of Environmental Information Interim Agency Life Cycle Management Policy Agency Directive; 2) the OSWER Quality Management Plan; 3) EPA IT standards; 4) Quality Assurance Requirements in all contract vehicles under which CERCLIS is being developed and maintained; and 5) EPA IT security policies. In addition, specific controls are in place for system design, data conversion and data capture, and CERCLIS outputs.

Data Quality Reviews: Three audits, two by the Office Inspector General (OIG) and the other by Government Accountability Office (GAO), assessed the validity of the data in CERCLIS. The OIG audit report, *Superfund Construction Completion Reporting* (No. E1SGF7_05_0102_ 8100030), dated December 30, 1997, concluded that the Agency "has good management controls to ensure accuracy of the information that is reported," and "Congress and the public can rely upon the information EPA provides regarding construction completions." The GAO report, *Superfund: Information on the Status of Sites* (GAO/RCED-98-241), dated August 28, 1998, estimated that the cleanup status of National Priority List (NPL) sites reported by CERCLIS as of September 30, 1997, is accurate for 95 percent of the sites. Another OIG audit, *Information Technology - Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Data Quality* (Report No. 2002-P-00016), dated September 30, 2002, evaluated the accuracy, completeness, timeliness, and consistency of the data entered into CERCLIS. The report provided 11 recommendations to improve controls for CERCLIS data quality. EPA has either implemented or continues to implement these recommendations.

The IG annually reviews the end-of-year CERCLIS data, in an informal process, to verify data that supports the performance measures. Typically, there are no published results.

EPA received an unqualified audit opinion by the OIG for the annual financial statements and recommends several corrective actions. The Office of the Chief Financial Officer indicates that corrective actions will be taken.

Data Limitations: The OIG audit, *Information Technology - Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Data Quality* (Report No. 2002-P-00016), dated September 30, 2002 identified some weaknesses. The Agency disagreed with the study design and report conclusions; however, the report provided 11 recommendations on improving data quality with which EPA concurred and either implemented or is implementing. The development and implementation of a quality assurance process for CERCLIS data continues. This process includes delineating data quality objectives for GPRA targets, program measures,

and regional data. The Agency has begun reporting compliance with current data quality objectives.

Error Estimate: The GAO's report, *Superfund: Information on the Status of Sites* (GAO/RECD-98-241), dated August 28, 1998, estimates that the cleanup status of National Priority List sites reported by CERCLIS is accurate for 95 percent of the sites. The OIG report, *Information Technology - Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Data Quality* (Report No. 2002-P-00016), dated September 30, 2002, states that over 40 percent of CERCLIS data on site actions reviewed was inaccurate or not adequately supported.

New/Improved Data or Systems: As a result of a modernization effort completed in 2004, CERCLIS has standards for data quality and each EPA Region's CERCLIS Data Entry Control Plan, which identifies policies and procedures for data entry,and is reviewed annually. EPA Headquarters has developed data quality audit reports and SOPs, which address timeliness, completeness, and accuracy, and has provided these reports to the Regions. Information developed and gathered in the modernization effort is a valuable resource for scoping the future redesign of CERCLIS. This redesign is necessary to bring CERCLIS into alignment with the Agency's mandated Enterprise Architecture. The first steps in this effort involved the migration of all 10 Regional databases and the Headquarters database into one single national database at the National Computing Center in RTP and the migration of Superfund Document Management System (SDMS) to RTP to improve efficiency and storage capacity. During this process SDMS was linked to CERCLIS which enabled users to easily transition between programmatic accomplishments as reported in CERCLIS and the actual document that defines and describes the accomplishments. EPA Headquarters is now scoping the requirements for an integrated SDMS-CERCLIS system, tentatively called the Superfund Enterprise Management System (SEMS). Work on SEMS started in FY 2007 and will continue through FY 2012.

SEMS will provide a common platform for major Superfund systems and future IT development. It will be constructed in part using EPA IT enterprise architecture principles and components. SEMS will provide a Superfund Program user gateway to various IT systems and information collections.

In an effort to better facilitate and capture important Superfund data, a new CERCLIS Five-Year Review Module was released June 2006. In addition, a new CERCLIS Reuse/Acreage Module was released in June 2007 to support two new performance measures. During FY 2009, CERCLIS data fields are being reviewed with the development of SEMS in mind. The enforcement module will be trimmed during FY 2010 to facilitate the data conversion which will be necessary to fully implement SEMS.

References: U.S. Environmental Protection Agency, EPA Performance and Accountability Reports, http://www.epa.gov/ocfo/par/index.htm (accessed December 30, 2009).

U.S. Environmental Protection Agency, Superfund Accomplishment and Performance Measures, http://www.epa.gov/superfund/accomplishments.htm (accessed December 30, 2009).

U.S. Environmental Protection Agency, Federal Facilities Restoration and Reuse Office – Performance measures, http://www.epa.gov/fedfac/documents/measures.htm (accessed December 30, 2009)

U.S. Environmental Protection Agency, Office of Inspector General, Superfund Construction Completion Reporting, E1SGF7_05_0102_8100030, http://www.epa.gov/oigearth/eroom.htm (accessed December 30, 2009).

U.S Environmental Protection Agency, Office of Inspector General, Information Technology - Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Data Quality, No. 2002-P-00016, http://www.epa.gov/oigearth/eroom.htm (accessed December 30, 2009).

U.S. Government Accountability Office, "Superfund Information on the Status of Sites, GAO/RCED-98-241", http://www.gao.gov/archive/1998/rc98241.pdf (accessed December 30, 2009).

U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation, *Superfund Program Implementation Manuals (SPIM)*, http://www.epa.gov/superfund/policy/guidance.htm (accessed July 30, 2009).

U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Respose, "OSWER Quality Management Plan", http://www.epa.gov/swerffrr/pdf/oswer_qmp.pdf (accessed December 30, 2009).

U.S. Environmental Protection Agency, Office of Environmental Information, EPA System Life Cycle Management Policy Agency Directive 2100.5, http://www.epa.gov/irmpoli8/ciopolicy/2100.5.pdf (accessed December 30, 2009).

U.S. Environmental Protection Agency, Office of Environmental Information, EPA IT Standards, http://basin.rtpnc.epa.gov/ntsd/itroadmap.nsf (accessed December 30, 2009).

U.S. Environmental Protection Agency, Office of Environmental Information, EPA's Information Quality Guidelines, http://www.epa.gov/quality/informationguidelines (accessed December 30, 2009).

U.S. Environmental Protection Agency, Office of Environmental Information, EPA IM/IT Policies, http://intranet.epa.gov/oeiintra/imitpolicy/policies.htm (accessed July 30, 2009).

FY 2011 Performance Measures:

- **Cumulative percentage of RCRA facilities with human exposures to toxins under control (program assessment measure)**
- **Cumulative percentage of RCRA facilities with migration of contaminated groundwater under control (program assessment measure)**
- **Cumulative percentage of RCRA facilities with final remedies constructed (program assessment measure)**
- **Number of final remedy components constructed at RCRA corrective action facilities per federal, state and private sector costs. (program assessment efficiency measure)**

Performance Database: The Resource Conservation and Recovery Act Information System (RCRAInfo) is the national database that supports EPA's RCRA program and all four corrective action performance measures.

Data Source: States and regions enter all data. With respect to meeting the human exposures to toxins controlled and releases to groundwater controlled, a "yes," "no", or "insufficient information" entry is made in the database. A separate entry is made in the database to indicate the date of remedy construction. Supporting documentation and reference materials are maintained in the Regional and state files. EPA's Regional offices and authorized states enter data on a continual basis. For the efficiency measure, federal and state costs are assembled from their respective budgets. Private sector costs are derived from Environmental Business Journal data.

Methods and Assumptions: RCRAInfo contains information on entities (generically referred to as "handlers") engaged in hazardous waste (HW) generation and management activities regulated under the portion of RCRA that provides for regulation of hazardous waste. Within RCRAInfo, the Corrective Action Module tracks the status of facilities that require, or may require, corrective actions, including information related to the four measures outlined above. Performance measures are used to summarize and report on the facility-wide environmental conditions at all RCRA Corrective Action Program's facilities. The environmental indicators are used to track the RCRA Corrective Action Program's progress in dealing with immediate threats to human health and groundwater resources. Known and suspected facility-wide conditions are evaluated using a series of simple questions and flow-chart logic to arrive at a reasonable, defensible determination. These questions were issued as a memorandum titled: *Interim Final Guidance for RCRA Corrective Action Environmental Indicators, Office of Solid Waste, February 5, 1999).* Lead regulators for the facility (authorized state or EPA) make the environmental indicator determination, but facilities or their consultants may assist EPA in the evaluation by providing information on the current environmental conditions.

The remedy construction measure tracks the RCRA Corrective Action Program's progress in moving sites towards final cleanup. Like with the environmental indicators determination, the lead regulators for the facility select the remedy and determine when the facility has completed construction of that remedy. Construction completions are collected on both an area-wide and site-wide basis for sake of the efficiency measure.

Suitability: States and regions generate the data and manage data quality related to timeliness and accuracy (i.e., the environmental conditions and determinations are correctly reflected by the data). EPA has provided guidance and training to states and regions to help ensure consistency in those determinations.

Access to RCRAInfo is open only to EPA Headquarters, Regional, and authorized state personnel. It is not available to the general public because the system contains enforcement sensitive data**.** The general public is referred to EPA's Envirofacts Data Warehouse to obtain filtered information on RCRA-regulated hazardous waste facilities.

QA/QC Procedures: Within RCRAInfo, the application software enforces structural controls that ensure that high-priority national components of the data are properly entered. RCRAInfo documentation, which is available to all users on-line, provides guidance to facilitate the generation and interpretation of data. Training on use of RCRAInfo is provided on a regular basis, usually annually, depending on the nature of systems changes and user needs. The latest version of RCRAInfo, Version 4 (V4), was released in December 2008 and has many added components that will help the user identify errors in the system.

Data Quality Reviews: GAO's 1995 Report on EPA's Hazardous Waste Information System (http://www.access.gpo.gov/su_docs/fdlp/pubs/study/studyhtm.html) reviewed whether national RCRA information systems support EPA and the states in managing their hazardous waste programs. Recommendations coincided with ongoing internal efforts (WIN/Informed) to improve the definitions of data collected, ensure that data collected provide critical information and minimize the burden on states. EPA's Quality Staff of the Office of Environmental Information conducted a quality systems audit in December 2003. The audit found the corrective action program satisfactory.

Data Limitations: No data limitations have been identified for the performance measures. As discussed above, the performance measure determinations are made by the authorized states and EPA Regions based on a series of standard questions and entered directly into RCRAInfo. EPA Corrective Action sites are monitored on a facility-by-facility basis and the QA/QC procedures identified above are in place to ensure data validity. For the efficiency measure, private sector costs are not publicly available. Estimates of these costs are derived from Environmental Business Journal data.

Error Estimate: N/A. Currently, the Office of Resource Conversation and Recovery (ORCR) does not collect data on estimated error rates.

New/Improved Data or Systems: EPA has successfully implemented new tools for managing environmental information to support federal and state programs, replacing the old data systems (the Resource Conservation and Recovery Information System and the Biennial Reporting System) with RCRAInfo. RCRAInfo allows for tracking of information on the regulated universe of RCRA hazardous waste handlers, such as facility status, regulated activities, and compliance history. The system also captures

detailed data on the generation of hazardous waste from large quantity generators and on the waste management practices of treatment, storage, and disposal facilities. RCRAInfo is web-accessible, providing a convenient user interface for federal, state and local managers, encouraging development of in-house expertise for controlled cost, and using commercial off-the-shelf software to develop reports from database tables.

References: U.S. Government Accounting Office Report to Congress. "Study to Identify Measures Necessary for a Successful Transition to a More Electronic Federal Depository Library System", June 1996.
http://www.access.gpo.gov/su_docs/fdlp/pubs/study/studyhtm.html (accessed December 22, 2009).

FY 2011 Performance Measures:

- **Number of LUST cleanups completed that meet risk-based standards for human exposure and groundwater migration. (program assessment measure)**
- **Number of LUST cleanups completed that meet risk-based standards for human exposure and groundwater migration in Indian country.**

Performance Database: Designated state agencies individually maintain records for reporting state program accomplishments. A new oracle web-based system is being developed, in conjunction with OSWER's Performance Assessment Tool, for the regions, states and territories to enter their data for these performance measures.

Data Source: The data suppliers are the states and territories who sign Leaking Underground Storage Tank (LUST) Corrective Action assistance agreements with EPA and the regions who provide assistance to the Tribes. Each EPA regional office manages their own states' assistance agreements. For the program assessment efficiency measure, OUST will estimate the value of this efficiency measure based on data that EPA and state agencies currently collect and maintain. Cleanup dollars are estimated from available information reported to states and this total is recognized as incomplete given the lack of publicly available information on private cleanup expenditures

Methods, Assumptions and Suitability: The cumulative number of confirmed releases where cleanup has been initiated and where the state has determined that no further actions are currently necessary to protect human health and the environment, includes sites where post-closure monitoring is not necessary as long as site specific (e.g., risk based) cleanup goals have been met. Site characterization, monitoring plans and site-specific cleanup goals must be established and cleanup goals must be attained for sites being remediated by natural attenuation to be counted in this category. (See http://www.epa.gov/OUST/cat/PMDefinitions.pdf.)

QA/QC Procedures: EPA/OUST will oversee the use of the QA/QC checklist, which identifies the QA/QC process regional program managers should follow for each state's data submission. Regions complete the QA/QC checklist, sign it and submit it to EPA/OUST. The QA/QC checklist will be incorporated into the web-based system.

Data Quality Review: EPA's regional grants project officers and regional program managers provide first-level data quality reviews and oversight of their recipients' program performance measure results. EPA/OUST provides second-level data quality reviews of all data.

Data Limitations: Data quality depends on the accuracy and completeness of state records.

Error Estimate: N/A

New/Improved Data or Systems: Web-based Oracle system accessed through EPA's portal.

References: *Semi-annual Report of UST Performance Measures, End of Fiscal Year 2009 – as of September 30, 2009, dated December 2009*; http://www.epa.gov/OUST/cat/ca_09_34.pdf (accessed on December 29, 2009)

FY 2011 Performance Measures:

- **Refer to DOJ, settle or write off 100% of Statute of Limitations (SOLs) cases for SF sites with total unaddressed past costs equal to or greater than $200,000 and report value of costs recovered**

- **Percentage of Superfund sites at which settlement or enforcement action taken before the start of RA.**

Performance Database: The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) is an automated, fully modernized EPA system that is used to capture and report on all essential program and enforcement performance information. CERCLIS is the Superfund program's primary repository of program, enforcement planning, and accomplishment data. CERCLIS contains national removal, site assessment, remedial, Federal facility, and enforcement program data for hazardous waste sites.

Data Source: EPA's regional offices are responsible for entering detailed site-specific information into CERCLIS, e.g., the status of cleanups, target and measure accomplishments, and resource planning and use information. EPA Headquarters routinely pulls and reviews CERCLIS data in order to effectively manage the Superfund program, evaluate progress towards reaching program performance goals and measures, and to report Superfund program accomplishments to internal and external stakeholders.

Methods, Assumptions and Suitability: There are no analytical or statistical methods used to derive this information. Headquarters pulls accomplishment data associated with targets and measures from CERCLIS on a quarterly basis using SCAP (Superfund

Comprehensive Accomplishments Plan) and Enforcement reports that provide summary and detailed site information.

QA/QC Procedures: To ensure data accuracy and control, various administrative controls have been established within the Superfund Program Implementation Manual (SPIM). The SPIM is a planning document that defines program management priorities, procedures, and practices for the Superfund Program. The SPIM also provides standardized and common definitions for program planning and reporting for the following areas:
1. Report Specifications are contained in CERCLIS reports indicating how reported data are pulled and displayed;
2. A Coding Guide contains technical instructions for data users such as Regional Information Management Coordinators (IMCs), program personnel, data owners, and data input personnel;
3. Quick Reference Guides (QRG) are available in the CERCLIS Documents Database and provide detailed data entry instructions for most CERCLIS modules;
4. Superfund Comprehensive Accomplishment (SCAP) and Enforcement reports are used to track, budget, plan, and evaluate progress towards meeting Superfund targets and measures; and 5. A historical lockout feature is provided in CERCLIS to ensure that any changes to past fiscal year data can only be made by approved personnel and are recorded within a Change Log report. These controls are contained in the Superfund Program Implementation Manual (SPIM) Fiscal Year 2008/2009 (http://www.epa.gov/superfund/action/process/spim08.htm).

CERCLIS operation and development is managed by the following administrative control and quality assurance procedures:
1. Office of Environmental Information Interim Agency Life Cycle Management Policy Agency Directive 2100.5, (http://www.epa.gov/irmpoli8/ciopolicy/2100.5.pdf);
2. The Office of Superfund Remediation and Technology Innovation Quality Management Plan, (http://www.epa.gov/swerffrr/pdf/oswer_qmp.pdf)
3. Agency platform, software, and hardware standards, (http://basin.rtpnc.epa.gov/ntsd/itroadmap.nsf);
4. Quality Assurance Requirements in all contract vehicles under which CERCLIS is being developed and maintained, (http://www.epa.gov/quality/informationguidelines); and
5. Agency security procedures, (http://basin.rtpnc.epa.gov/ntsd/ITRoadMap.nsf/Security?OpenView).
In addition to the above, specific controls are in place for system design, data conversion, data capture, and CERCLIS outputs.

Data Quality Review: The IG annually reviews the end-of-year CERCLIS data, in an informal process, to verify the data supporting the performance measure. Typically, there are no published results.

Data Limitations: None

Error Estimate: NA

New/Improved Data or Systems: None

References: Office of Site Remediation Enforcement (OSRE) Quality Management Plan, approved October 2, 2007.

GOAL 3 OBJECTIVE 3

FY 2011 Performance Measures:

- **Percentage of planned outputs delivered in support of the manage material streams, conserve resources and appropriately manage waste long-term goal (program assessment measure)**
- **Percentage of planned outputs delivered in support of the mitigation, management and long-term stewardship of contaminated sites long-term goal (program assessment measure)**

Performance Database: Integrated Resources Management System (internal database).

Data Source: Data are generated based on self-assessments of completion of planned program outputs.

Methods, Assumptions and Suitability: To provide an indication of progress towards achievement of the Land Preservation and Restoration Research Program's long-term goals, the Land program annually develops a list of key research outputs scheduled for completion by the end of each fiscal year. This list is finalized by the start of the fiscal year, after which no changes are made. The program then tracks quarterly the progress towards completion of these key outputs against pre-determined schedules and milestones. The final score is the percent of key outputs from the original list that are successfully completed on-time.

QA/QC Procedures: Procedures are now in place to require that all annual outputs be clearly defined and mutually agreed upon within ORD by the start of each fiscal year. Progress toward completing these activities is monitored by ORD management

Data Quality Reviews: N/A

Data Limitations: Data do not capture the quality or impact of the research outputs being measured. However, long-term performance measures and independent program reviews are used to measure research quality and impact. Additionally, completion rates of research outputs are program-generated, though subject to ORD review.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: Contaminated Sites Multi-Year Plan, available at: http://www.epa.gov/osp/myp/csites.pdf (last accessed on July 20, 2007)
Resource Conservation and Recovery Act (RCRA) Multi-Year Plan, available at: http://www.epa.gov/osp/myp/rcra.pdf (last accessed on July 20, 2007)
Land Protection and Restoration Research Program Assessment, available at: http://www.whitehouse.gov/omb/expectmore/summary/10004305.2006.html (last accessed August 16, 2007)

FY 2011 Performance Measure:

- **Average time (in days) for technical support centers to process and respond to requests for technical document review, statistical analysis and evaluation of characterization and treatability study plans. (Efficiency Measure)**

Performance Database: No internal tracking system.

Data Source: Data are generated based on technical support centers' tracking of timeliness in meeting customer needs.

Methods, Assumptions and Suitability: The dates of requests, due dates, response time, and customer outcome feedback are tabulated for the Engineering, Ground Water, and Site Characterization Technical Support Centers.

QA/QC Procedures: N/A

Data Quality Reviews: N/A

Data Limitations: N/A

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: Land Protection and Restoration Research Program Assessment, available at: http://www.whitehouse.gov/omb/expectmore/summary/10004305.2006.html (last accessed August 16, 2007)

FY 2011 Performance Measures:

- **Percentage of Land research publications rated as highly cited papers (program assessment measure).**
- **Percentage of Land research publications in high impact journals. (program assessment measure)**

Performance Database: No internal tracking system.

Data Source: Searches of Thomson Scientific's *Web of Science* and *Scopus* are conducted to obtain "times cited" data for programs' publications. Analyses are completed using Thomson's *Essential Science Indicators (ESI)* and *Journal Citation Reports (JCR)* as benchmarks. *ESI* provides access to a unique and comprehensive compilation of essential science performance statistics and science trends data derived from Thomson's databases.

Methods, Assumptions and Suitability: For influence and impact measures, *ESI* employs both total citation counts by field and cites per paper scores. The former reveals gross influence while the latter shows weighted influence, also called impact. *JCR* is a recognized authority for evaluating journals. It presents quantifiable statistical data that provide a systematic, objective way to evaluate the world's leading journals and their impact and influence in the global research community. The two key measures used in this analysis to assess the journals in which a program's papers are published are the Impact Factor and Immediacy Index. The Impact Factor is a measure of the frequency with which the "average article" in a journal has been cited in a particular year. The Impact Factor helps evaluate a journal's relative importance, especially when compared to other journals in the same field.

QA/QC Procedures: N/A

Data Quality Reviews: N/A

Data Limitations: Analyses do not capture citations within EPA regulations and other key agency documents.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: Bibliometric Analysis for the U.S. Environmental Protection Agency/Office of Research and Development's Land Protection and Restoration Research Program, available at: http://es.epa.gov/ncer/publications/bibliometrics/remediation_bibliometric_2005_021308.html (last accessed on Aug 21, 2008)

GOAL 4 OBJECTIVE 1

FY 2011 Performance Measure:

- **Contract cost reduction per study for assay validation efforts in the Endocrine Disruptor Screening Program. (program assessment efficiency measure)**

Performance Database: EPA will measure the contract cost reduction per study for assay validation efforts in the Endocrine Disruptor Screening Program (EDSP) by comparing the cost per study from a previous contract to the cost of a newer multiple awards contract. The newer multiple awards contract involves competition for individual work assignments among two vendors in an effort to provide increased flexibility in both the economic and scientific aspects of the contract. In addition, assays that have now been standardized may be competed on a fixed price, rather than level of effort basis, which will lead to reduced costs for the government.

This efficiency measure must be used in conjunction with the program's annual performance measure (cumulative number of assays validated) to obtain a complete picture of program performance. This is consistent with direction received during the FY 2006 program assessment review of EPA's Endocrine Program - to have efficiency measures and annual performance measures, that when taken together, give a full picture of the program.

Data Source: Information will be obtained from contract documents and stored in spreadsheets by OSCP personnel responsible for managing the contracts.

Methods and Assumptions: The baseline average cost per study was calculated based on contract costs from a previous EDSP contract. A laboratory study was defined as conduct of an assay with a single chemical in a single lab, and represents standardized study costs based on a mix of *in vitro* and *in vivo* studies, as well as detail review papers. The baseline average cost per study was $62,175 in 2006. The measure of efficiency will be based on similar data from the newer multiple award contract and judged based on the target of a 1% cost reduction per year for three (3) years.

Suitability: The majority of funds allocated to the EDSP are spent on laboratory studies conducted by contractors. As a result, a measure based on the contract costs is a suitable measure of efficiency for this program.

QA/QC Procedures: Costs for products generated by scientific labs are used for this efficiency measure. OPPTS's Office of Science Coordination and Policy (OSCP) maintains spreadsheets to track contract expenditures by study. These spreadsheets are periodically checked against contract records and EPA contracts databases (i.e., Data Financial Warehouse).

Data Quality Review: Data generated from these spreadsheets, for the purposes of this efficiency measure, will be independently reviewed for accuracy before submitting information on this measure.

Data Limitations: In general, there is a data lag of approximately 9-24 months due to the variation in length and complexity of the lab studies, and for time required for review, analysis and reporting of data.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: EPA Website; EPA Annual Report; Endocrine Disruptor Screening Program Proposed Statement of Policy, Dec. 28, 1998; Endocrine Disruptor Screening and Testing Advisory Committee (EDSTAC) Final Report (EPA/743/R-98/003); EPA Contract # 68-W-01-023.

FY 2011 Performance Measure:

- **Annual number of hazard characterizations completed for HPV chemicals**

Performance Database: EPA uses a reporting spreadsheet called "HPV_HC_tracking_date.xls"" to track the number of completed Screening Level Hazard Characterization Reports. The spreadsheet is located on the OPPT secure "I" share drive. This information is supplemented and aligned twice a year with an international database of chemicals sponsored internationally through Screening Information Data Sets (SIDs) Initial Assessment Meetings. Hazard characterizations are made publicly available through OPPT's High Production Volume Information System (HPVIS).

Data Source: The Screening Level Hazard Characterization Reports are completed by EPA staff based on submissions from chemical sponsors, and are completed for both U.S. HPVs and international SIDS chemicals. Each screening level hazard characterization document represents a thorough review by qualified EPA personnel of the information provided by the submitter. Once a report is completed, as determined by senior scientist and management review, the spreadsheet is updated with the chemical name and date of completion.

Methods and Assumptions: This measure analyzes and supplements data received through HPV challenge. An assessment of adequacy is made for HPV chemicals defined as approximately 2,450 chemicals (1400 US Sponsored chemicals, 850 International sponsored chemicals, and 200 Original Organization for Economic Cooperation and Development (OECD) SIDS Initial Assessment Report (SIARs)). The measure is a count of completed reports which are then posted on EPA's website. Note, some hazard

characterizations may update older documents. In these cases, credit is given for most recent update, while reducing previous year count.

Suitability: This output measure supports the overall goal of reducing risk from HPV chemicals and is suitable for year to year as well as quarter to quarter comparisons. Hazard screening is an important step in reducing risk and represents a key priority for the existing chemicals program. The data collected in support of this measure are suitable for use in performance measurement because they supply critical information used by EPA in setting targets and conducting measurements under the measure.

QA/QC Procedures: OPPT has in place a signed Quality Management Plan ("Quality Management Plan for the Office of Pollution Prevention and Toxics; Office of Prevention, Pesticides and Toxic Substances," November 2008).

Data Quality Reviews: Recent GAO reviews found that EPA does not routinely assess the risks of all existing chemicals and faces challenges in obtaining the information necessary to do so.
EPA has taken several steps to respond to these reviews including more aggressive efforts to collect data, continued efforts to assess data through hazard characterizations, and increased emphasis on risk management activities for chemicals of concern.

Data Limitations: None.

Error Estimate: Not applicable. No models, assumptions or statistical methods are applied.

New/Improved Data or Systems:

References:

GAO-05-458: Chemical Regulation: Options Exist to Improve EPA's Ability to Assess Health Risks and Manage Its Chemical Review Program, June 2005

GAO-06-1032T: Chemical Regulation: Actions Are Needed to Improve the Effectiveness of EPA's Chemical Review Program, August 2006

GAO-09-271: High Risk Series- An update. Transforming EPA's Processes for Assessing and Controlling Toxic Chemicals January 2009.

<u>FY 2011 Performance Measure:</u>

- **Millions of dollars in termite structural damage avoided annually by ensuring safe and effective pesticides are registered/reregistered and available for termite treatment (program assessment measure)**

Performance Database: Baseline data on the number of owner-occupied structures is available from US Census Housing data. Estimates of the extent of termiticide use and termite-related damage are available from several industry and academic sources.

Data Source: Baseline data are derived from several sources, including U.S. Census data, surveys conducted by the pest control industry, and academic publications.

Methods, Assumptions and Suitability: This measure is representative of the explicit statutory mandate of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) to ensure the availability of pesticides to permit their societal benefits. An important role of the National Pesticide Program is to prevent harm and preserve a level of public protection.

Pesticides are the primary means to treat or prevent termite infestation. These pesticides are not available for use to treat or prevent this problem unless the National Pesticide Program evaluates their safety and allows them into the marketplace through the Registration or Registration Review programs. Timely and effective licensing actions are required for homeowners to have access to the benefits of these pesticides and avoid the significant economic loss from termite structural damage.

Termites are one of the most economically important insect pests in the United States. Approximately 1.5 million homes are treated for termite infestations each year. Homeowners insurance can help recover losses from fires, storms, and earthquakes, but it is almost impossible to carry insurance against termite infestation and damage. This measure will utilize data that estimate the number of homes that suffer termite-related damage on an annual basis, the value of this damage, the number and frequency of termiticide treatments, and an estimate of the number of treated homes that would have received termite damage absent the use of pesticide control measures.

Through this measure, the Agency will evaluate the extent of termiticide use to protect owner-occupied housing units, average termite damage on a per housing unit basis, and an estimate of the termite structural damage avoided as a result of having safe and effective termite control products available for use.

QA/QC Procedures: EPA adheres to its approved Quality Management Plan in ensuring the quality of the data used in this measure. Academic research undergoes strict peer-review prior to publication. The Agency will work with non-governmental providers of data to ensure that quality data are used in developing this measure.

Data Quality Reviews: Staff and management of the Office of Pesticide Programs will perform the data quality reviews under the leadership of our QA/QC officers.

Data Limitations: This measure continues to be refined. Currently available data were not collected for performance accountability purposes and may lack precision. Non-pesticide treatment actions may account for some structural damage avoided.

Error Estimate: Error estimates for established surveys are documented by these organizations in their survey reports.

New/Improved Data or Systems: This measure will utilize existing data as well as new data developed from industry and academic research.

References: Clausen, C.A. and F. Green. 2002. Home wreckers in search of moisture. Techline. USDA Forest Service, Forest Products Laboratory, II-5. http://www.fpl.fs.fed.us/documnts/techline/ii-5.pdf

Gold, R.E., M.E. Merchant, and G.J. Glenn. Undated. How to select a termite control service. The Texas A&M University System, Texas Agricultural Extension Service. L-1785

LSU AgCenter. 2005. Termite Facts and Figures. Louisiana State University. http://www.lsuagcenter.com/en/environment/insects/Termites/formosan_termites/Termite+Facts+and+Figures.htm

Strayhorn, C.K. 1997. Homeowners beware. Window on State Government. Texas Comptroller of Public Accounts. Fiscal Notes, August 1997. http://www.cpa.state.tx.us/comptrol/fnotes/fn9708.html

Su, N.-Y. 2002. Novel technologies for subterranean termite control. Sociobiology 40(1):91-101.

Williams, L.H. and R. V. Smythe. 1979. Estimated losses caused by wood products insects during 1970 for single-family dwellings in 11 Southern States. U.S. Department of Agriculture Forest Service, Research paper SO-145.

FY 2011 Performance Measure:

- **Billions of dollars in crop loss avoided by ensuring that effective pesticides are available to address pest infestations. (program assessment measure)**

Performance Database: To determine the value of potential crop loss avoided from the use of pesticides, baseline and future data are collected on crop market prices, crop production, total acres grown, acres treated with pesticides, and the percentage of crop yield loss avoided as a result of the use of pesticides.

Data Source: Baseline data on crop market prices, crop production, and total acres grown are from United States Department of Agriculture (USDA) databases, while the percentage of potential yield loss without pesticides is estimated by Biological and Economic Analysis Division (BEAD) scientists based on published and unpublished studies. The number of acres treated with the pesticides is based on data submitted by State Departments of Agriculture.

Methods, Assumptions and Suitability: The potential average AEL (avoided economic loss) per emergency use granted is based on the actual acres for which the pesticide is used. Data are available on yield losses without the emergency pesticide uses and the actual acres treated with the pesticides allowed under the emergency exemptions. The method for estimating this value involves calculating the potential crop loss avoided based on the acres treated with the pesticides, per acre crop production and prices received, and potential yield without the pesticides. In an attempt to measure the magnitude of this potential crop loss avoided, the value is measured as a percent of state production in value and national production in value.

The United States (U.S.) has a large cropland, productive soils, and a variety of favorable agricultural climates. These factors contribute to and enable the U.S. to be a uniquely large and productive agricultural producer. The value of agricultural crop production in the U.S. totaled $239 billion[1] in 2006. Major field crops in value in 2007 were corn ($52 billion), soybeans ($27 billion), wheat ($14 billion), and cotton ($5 billion), while tomatoes ($2.2 billion), apples ($2.4 billion), and strawberries ($1.7 billion) are major fruit/vegetable crops in value. (USDA, 2008)

American agricultural production far outweighs domestic consumption and the U.S. is one of the World's largest agricultural exporters, worth approximately $82 billion in FY2007 (over one quarter of total U.S. agricultural crop production). In order to be competitive in the world market and to provide sufficient market supply for American consumers, U.S. farmers need to be able to use pesticides for pest control as long as they do not present significant risks to human health or the environment (USDA/ERS, 2008).

QA/QC Procedures: EPA adheres to its approved Quality Management Plan in ensuring the quality of the data derived from States, and USDA. The data used for the outcome measure is based on well-established QA/QC procedures found in *Data Quality Assessment: A Reviewer's Guide* (QA/G-9R)[2] (PDF 61pp, 225K), http://www.epa.gov/quality/dqa.html, which provides guidance on assessing data quality criteria and performance specifications.

Data Quality Review: The measure will utilize USDA/NASS methods of collecting and analyzing data.

Data Limitations: This measure is under development. Data limitations will be characterized during developmental stages of the measure and a complete evaluation will be provided in the Agency's annual Performance and Accountability Report.

Error Estimate: USDA provides discussion of analytical methods and associated variability estimates in its chemical use publications. For example, see the Agricultural Chemical Distribution Tables section, Survey and Estimation Procedure section and Reliability section of the USDA publication Agricultural Chemical Usage 2005 Field Crops Summary

[1] The value received by farmers was $239 billion in 2006

New/Improved Data or Systems: This measure will utilize existing data and data systems.

References:
USDA data sources include: United States Department of Agriculture (USDA), National Agricultural Statistics Service (NASS). Agricultural Chemical Usage.
http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1001

United States Department of Agriculture (USDA), National Agricultural Statistics Service (NASS). Agricultural Statistics. http://www.usda.gov/nass/pubs/agstats.htm

FY 2011 Performance Measure:

- **Percent of urban watersheds that do not exceed the National Pesticide Program aquatic life benchmarks for three key pesticides of concern (diazinon, chlorpyrifos and malathion) (program assessment measure)**

Performance Database: Baseline data are obtained from the United States Geological Survey (USGS) National Water-Quality Assessment (NAWQA) program's 2006 report: Pesticides in the Nation's Streams and Ground Water, 1992-2001 (http://ca.water.usgs.gov/pnsp/). Future data will be compiled from future reports.

Data Source: Baseline data are derived from the USGS National Water-Quality Assessment (NAWQA) program's 2006 report: Pesticides in the Nation's Streams and Ground Water, 1992-2001. USGS is currently developing sampling in its second cycle (cycle II) from 2002-2012, Data are available to the public on USGS-NAWQA website from the (http://water.usge.gov/nawqa). USGS is currently developing sampling plans for 2013 – 2022. Future data will be available from USGS as it is made available on public websites.

Methods, Assumptions and Suitability: Water quality is a critical endpoint for measuring exposure and risk to the environment. It is a high-level measure of our ability to reduce exposure from key pesticides of concern. This measure evaluates the reduction in water concentrations of pesticides as a means to protect aquatic life. Reduced water column concentration is a major indicator of the efficacy of risk assessment, risk management, risk mitigation and risk communication actions. It will illuminate program progress in meeting the Agency's strategic pesticide and water quality goals.

The goal is to develop long-term consistent and comparable information on the amount of pesticides in streams, ground water, and aquatic ecosystems to support sound management and policy decisions. USGS-NAWQA data can help inform EPA of the long-term results of its risk management decisions based on trends in pesticide concentrations. Monitoring plans call for bi-yearly sampling in 8 urban watersheds; and sampling every four years in a second set of 9 urban watersheds. The sampling frequency for these sites will range from approximately 13 to 26 samples per year depending on the

size of the watershed and the extent of pesticide use period. Sampling frequency is seasonally weighted so more samples are collected when pesticide use is expected to be highest. USGS is currently developing sampling plans for 2013 – 2022.

QA/QC Procedures: EPA adheres to its approved Quality Management Plan in ensuring the quality of the data obtained from USGS. The data that will be used for the outcome measure is based on well-established QA-QC procedures in the USGS-NAWQA program (http://ca.water.usgs.gov/pnsp/rep/qcsummary/ and http://water.usgs.gov/owq/FieldManual/index.html).

Data Quality Review: The measure will utilize USGS NAWQA data. USGS is preeminent in the field of water quality sampling. Since 1991, the USGS NAWQA program has been collecting and analyzing data and information in major river basins and aquifers across the Nation. The program has undergone periodic external peer-review (http://dels.nas.edu/water/monitoring.php).

Data Limitations: This measure is under development. Data limitations will be characterized during developmental stages of the measure and a complete evaluation will be provided in the NAWQA 2011 "Cycle II" Study Report. EPA will request that USGS add additional insecticides to their sampling protocols to establish base line information for newer products that have been replacing the organophosphates (e.g., the synthetic pyrethroids). Although the USGS has performed a reconnaissance of pyrethoids occurrence is bed sediment, there is not currently a comprehensive monitoring strategy.

Error Estimate: The USGS database provides estimates of analytical methods and associated variability estimates (http://ga.water.usgs.gov/nawqa/data.qa.html).

New/Improved Data or Systems: This measure will utilize existing data and data systems.

References: USGS National Water-Quality Assessment (NAWQA) program's 2006 report: Pesticides in the Nation's Streams and Ground Water, 1992-2001.

The NAWQA 2011 "Cycle II" Study Report does not exist at this time – the sampling is in progress, thus there is no citation at this time. USGS has not published their sampling plan. There will be a USGS report in the 2011 timeframe.

FY 2011 Performance Measure:

- **Percent reduction in moderate to severe incidents for six acutely toxic agricultural pesticides with the highest incident rate (program assessment measure)**

Performance Database: Most of the nation's Poison Control Centers (PCCs) participate in a national data collection system known as the National Poisoning Data System (NPDS). Among the types of exposures reported are pesticide related incidents in both

residential and occupational settings. The data collected include date of call, age, gender, location of exposure, route of exposure, substance exposed to, route of exposure, initial symptom assessment, treatment received and an evaluation of the medical outcome. Symptoms are categories as minor, moderate, or major with criteria for each category.

Data Source: NPDS, formerly known as the Toxic Exposure Surveillance System (TESS), is one of the most comprehensive sources of surveillance data on poisonings in the United States. NPDS is a uniform database of PCCs, which are members of the American Association of Poison Control Centers (AAPCC), and are distributed throughout the United States. The database was established in 1985 and now includes information on more than 36 million exposure cases. In 2006, 61 PCCs received more than 4 million cases, including more than 2.4 million human exposure cases and 1.4 million informational calls.

NPDS is a valuable public health resource and has been utilized to identify hazards, develop education priorities, guide clinical research, and identify chemical and bioterrorism incidents. As a result, NPDS has helped prompt product reformulations, recalls, and bans, support regulatory actions, and provide post-marketing surveillance of new drugs.[2]

Each individual PCC provides 24-hour emergency medical information on the diagnosis and treatment of poisonings. The calls are managed primarily by AAPCC-certified Specialists in Poison Information (SPIs), who are typically pharmacists and nurses that have managed at least 2,000 calls. SPIs are required to complete detailed electronic medical records for both exposure and informational calls. The electronic medical records include general demographic information, including age, gender, location of exposure, and more detailed information if an exposure may have occurred, including suspected substance, reason for exposure, route of exposure, management site, symptoms, and medical outcome. To assist SPIs and ensure database uniformity, many of the fields included in the electronic medical records use categories that have been defined by the AAPCC. For example, SPIs characterize the medical severity of possible exposures using the medical outcome field, which includes the AAPCC-defined categories “None,” “Minor,” “Moderate,” “Major,” or “Death.” Additionally, the records may also contain several open fields, which allow SPIs to record additional information that may be relevant to the treatment and diagnosis of each case.

Methods, Assumptions and Suitability: We assume resources will continue to be available for the Agency to purchase the data and that adequate resources will be available at the local level to continue to fund the centers. The reduction in poisoning incidents is expected to result from mitigation measures made during the reregistration, from greater availability of lower risk alternative products resulting from the Agency’s reduce risk registration process, from the continued implementation of worker protection enforcement and training.

---

[2] Bronstein AC, DA Spyker, LR Cantilena, J Green, BH Rumack, SE Heard. 2006 Annual Report of the American Association of Poison Control Centers’ National Poison Data System. *Clinical Toxicology* (2007) 45, 815–917.

QA/QC Procedures: PCCs must be certified by the American Association of Poison Control Centers (AAPCC). To be certified a PPC must have a board certified physician on call at all times, have AAPCC certified specialists available to handle all calls, have a comprehensive file of toxicology information readily available, maintain Standard Operating Procedures (SOPs), keep records on all cases and have an ongoing quality assurance program. In addition, EPA staff screen each case before analyzing the data set.

Data Quality Review: EPA conducts regular case reviews and audits to assure quality assurance of data collected. Also, as mentioned above, EPA staff reviews each case before entering into its database.

Data Limitations: Because PCC participation is voluntary and the available resources vary from year to year, the data contains uncertainty.

Error Estimate: Because the incidents are self-reported, there is a potential bias in the data. However, there is no reason to believe that the bias will change from year to year

New/Improved Data or Systems: Not known at this time.

References: Poison Control Centers TESS (Toxic Exposure Surveillance System)
http://www.aapcc.org/poison1.htm

FY 2011 Performance Measure:

- **Improve or maintain a rate of incidents per 100,000 potential risk events in population occupationally exposed to pesticides (program assessment measure)**

Performance Database: Most of the nation's Poison Control Centers (PCCs) participate in a national data collection system known as the National Poisoning Data System (NPDS). Among the types of exposures reported are pesticide related exposures in both residential and occupational settings. The data collected include date of call, age, gender, location of exposure, route of exposure, substance exposed to, initial symptom assessment, treatment received and an evaluation of the medical outcome. Symptoms are categorized as minor, moderate, or major with standard criteria for each category.

Data Sources:

Health Incident Data:
NPDS, formerly known as the Toxic Exposure Surveillance System (TESS), is one of the most comprehensive sources of surveillance data on poisonings in the United States. NPDS is a uniform database of PCCs, which are members of the American Association of Poison Control Centers (AAPCC), and are distributed throughout the United States. The database was established in 1985 and now includes information on more than 36

million exposure cases. In 2006, 61 PCCs received more than 4 million cases, including more than 2.4 million human exposure cases and 1.4 million informational calls.

NPDS is a valuable public health resource and has been utilized to identify hazards, develop education priorities, guide clinical research, and identify chemical and bioterrorism incidents. As a result, NPDS has helped prompt product reformulations, recalls, and bans, support regulatory actions, and provide post-marketing surveillance of new drugs.[3]

Each individual PCC provides 24-hour emergency medical information on the diagnosis and treatment of poisonings. The calls are managed primarily by AAPCC-certified Specialists in Poison Information (SPIs), who are typically pharmacists and nurses that have managed at least 2,000 calls. SPIs are required to complete detailed electronic medical records for both exposure and informational calls. The electronic medical records include general demographic information, including age, gender, location of exposure, and more detailed information if an exposure may have occurred, including suspected substance, reason for exposure, route of exposure, management site, symptoms, and medical outcome. To assist SPIs and ensure database uniformity, many of the fields included in the electronic medical records use categories that have been defined by the AAPCC. For example, SPIs characterize the medical severity of possible exposures using the medical outcome field, which includes the AAPCC-defined categories "None," "Minor," "Moderate," "Major," or "Death." Additionally, the records may also contain several open fields, which allow SPIs to record additional information that may be relevant to the treatment and diagnosis of each case.

Data from the NPDS database are used for the number of occupational incidents - numerator. Specifically, it includes occupational incidents from exposures to disinfectants, algecides and conventional pesticides, including those with multiple active ingredients and where no active ingredient is identified.

The number of potential risk events in the population occupationally exposed to pesticides - the denominator - is calculated from several sources. The estimate of agricultural field workers is from the Department of Labor's National Agricultural Workers Survey. Department of Labor's Bureau of Labor Statistics captures employment characteristics for the national workforce. The denominator also uses EPA/OPP's annual report of Certified Applicators, and an estimate for the number of field entries by farmworkers from the 1992 Regulatory Impact Analysis for the Agricultural Worker Protection Standard.

Methods, Assumptions and Suitability:
This performance measure is based on the annual number of occupational pesticide incidents. A critical assumption is that EPA's pesticide program's efforts have a direct impact on the decline of pesticide incidents and that additional external factors have no

[3] Bronstein AC, DA Spyker, LR Cantilena, J Green, BH Rumack, SE Heard. 2006 Annual Report of the American Association of Poison Control Centers' National Poison Data System. *Clinical Toxicology* (2007) 45, 815–917.

effect on the number of pesticide incidents (e.g.; all influences on occupational incidents arise from the program's efforts). From recent assessments, we do believe that occupational poisonings are declining and that OPP's actions contribute significantly to the reduction.

Calculation Description:

For the numerator :
Universe of Occupationally Exposed Individuals:

1. Certified Applicators = 1,100,000
2. "Under the Supervision" Applicators (Assume 4 X CA) = 4,000,000
3. Other Occupational Pesticide Users = 2,500,000*

* = Bureau of Labor Statistics calculates there are 50,000,000 employees in non-agricultural fields that we believe utilize pesticides as part of their business (e.g., healthcare support; food preparation; building & grounds cleaning & maintenance; production; etc.). We assume that 5% of those employees apply pesticides.

4. Agricultural Farmworkers = 1,800,000

Potential Pesticide Risk Events:

For occupational users (Groups #1 - 3 above), we assume every pesticide application has the potential to create a pesticide incident with adverse health effects. We conservatively estimate each individual in those groups makes 4 pesticide applications per year. Therefore,

7,600,000 occupational users X 4 applications/year = 30,400,000 Potential Pesticide
Risk Events/Year

Agricultural Farmworkers spend an average of 105 days/year in the field (1992 Regulatory Impact Analysis for the Agricultural Worker Protection Standard). We assume that 5% of field entries present potential risk from pesticide exposure. Therefore,

105 days per/year X 5% = 5.25 Potential Pesticide Risk Events/Year/Farmworker
5.25 X 1,800,000 Ag Farmworkers = 9,450,000 Potential Pesticide Risk Events/Year

30,400,000 + 9,450,000 = 39,850,000 Total Potential Pesticide Risk Events/Year

Occupational Pesticide Incidents:

The Poison Control Centers' Toxic Exposure Surveillance System recorded there were an average of 1388 occupational pesticide incidents with adverse health impacts in 2001 – 2003, the most recent data available.

RATE OF INCIDENTS PER POTENTIAL PESTICIDE RISK EVENTS PER YEAR

$$\frac{\text{1388 occupational pesticide incidents per}}{\text{39,850,000 potential pesticide risk events/year}} = \text{3.5 incidents per 100,000 potential pesticide risk events/year}$$

QA/QC Procedures: PCCs must be certified by the American Association of Poison Control Centers (AAPCC). To be certified a PPC must have a board certified physician on call at all times, have AAPCC certified specialists available to handle all calls, maintain a comprehensive file of toxicology information, maintain SOPs, retain case records, and have a quality assurance program.

Data Quality Review: For the incident data, regular case reviews and audits are scheduled to assure quality assurance of data collected by the Poison Centers. All data in the NPDS system is subject to quality assurance requirements.

Data Limitations: Experts believe pesticide poisonings are under-reported to surveillance sources, for reasons, including the symptoms of pesticide poisoning generally are difficult to identify; there are few biomarkers for pesticides; and because the exposed individual may not seek medical care or report their illness. Additionally, not all states require mandatory physician reporting, and those that do may have difficulty enforcing that requirement.

The denominator data for non-agricultural workers is from 2004; more recent BLS data were not available.

Error Estimate: The number of potential risk events/year is most likely underestimated, because we used conservative estimates in estimating the potential number of events. For example, we estimated only 4 applications per year per individual which is likely to be a very low estimate.

New/Improved Data or Systems: Not known at this time.

References:

American Association of Poison Control centers: http://www.aapcc.org/poison1.htm

Department of Labor's National Agricultural Workers Survey: http://www.dol.gov/asp/programs/agworker/naws.htm

Department of Labor's Bureau of Labor Statistics: Occupational Employment and Wages, November 2004: http://www.bls.gov/news.release/archives/ocwage_11092005.pdf

EPA/OPP's annual report of Certified Applicators: http://www.epa.gov/oppfead1/safety/applicators/data.htm

1992 Regulatory Impact Analysis for the Agricultural Worker Protection Standard

FY 2011 Performance Measure:

- **Reduced cost per pesticide occupational incident avoided (program assessment efficiency)**

Performance Database:

Health Incident Data
Poison Control Centers' Toxic Exposure Surveillance System (PCC/TESS)

The Association of American Poison Control Centers (AAPCC) began collecting data for the purpose of identifying the leading hazards to humans from poisoning and to provide resources for the management of these exposures.

Poison Control Centers are usually run by a hospital or university. Approximately 99% of the nation's Poison Control Centers (PCCs) send incident data to the Toxic Exposure Surveillance System (TESS), the national data collection system started in 1983. Each PCC receives a minimum of 10,000 calls annually. About 13% of calls are from health care providers treating patients and 87% of calls are from individuals who need assistance in managing an exposure to poison. From 1993-1996, 92% of reported exposures occurred in a residential setting. PCC collects data on exposures to any substance and pesticide poisonings make up about 3% of all cases. PCCs submit data to TESS 2 to 4 times per year.

Cost Data
Cost estimates are based on the President's budget and State and Regional Assistance Grants funding documents.

Data Source:

Health Incident Data
Poison Control Centers' Toxic Exposure Surveillance System (PCC/TESS)

Most cases in TESS are submitted by certified PCCs through their staff, and are received from the public.

Methods, Assumptions and Suitability: This efficiency measure is based on the annual number of occupational pesticide incidents. A critical assumption is that EPA's pesticide program's efforts have a direct impact on the decline of pesticide incidents and that additional external factors have no effect on the number of pesticide incidents (e.g.,all influences on occupational incidents arise from the program's efforts). From recent assessments, we do believe that occupational poisonings are declining and that OPP's actions contribute significantly to the reduction.

Calculation:

$$\frac{\text{Worker Safety Resources (\$)}}{\text{Pesticide Occupational Incidents Avoided}} = \text{Cost /Pesticide Occupational Incident Avoided}$$

Worker Safety Resources = Value of extramural and Full Time Employee (FTE) Resources from the President's Budget request identified as supporting EPA Headquarters worker protection activities; and State and Regional Assistance Grants (STAG) monies. It does not include headquarters resources for worker protection in the Registration/Re-Registration/Registration Review programs, because would result in double-counting. Regional resources for field programs are in the form of FTEs, which are parsed differently into worker protection, water quality, and strategic agricultural initiatives by the Regions depending on their priority objectives. These data are not currently available. An additional complication is the fact that states provide substantial funding for these programs as well, and their contribution is not included here.

For recent years, annual STAG funds for worker safety (C&T and WP) total $6.6M. The President's Budget has remained relatively constant at $2.7M for Agricultural Worker Protection and $2.7M for Pesticide Applicator per year, for an average of $12M as the numerator in the baseline calculation.

Pesticide Occupational Incidents Avoided = Using pesticide incident data from Poison Control Centers' Toxic Exposure Surveillance System, OPP established a baseline for average incidents per year. Use of an average of three years is appropriate to account for inconsequential fluctuations in the counts.

This measure will be tracked as follows: we will review annual occupational incident data and compare it with the rolling average for the baseline. If the average number of incidents from the most recent three years is below the baseline, the difference will be the incidents avoided for use in the calculation.

QA/QC Procedures: Most cases in TESS are submitted by certified PCC. Certification of the PCC requires that there be board certified physicians with expertise in toxicology on-call at all times, poison information specialists available to handle calls, access to a major medical library, guidelines for follow-up of each case to determine the patient's final disposition or medical outcome. Taken together these criteria help to assure the quality of the data.

Each Poison Control Center uses standard format for data collection. Standard data elements include location of victim at the time of exposure, substance exposed to, route of exposure, initial symptom assessment, and evaluation of medical outcome after case follow up. Cases with symptoms are categorized by severity as minor, moderate, or major.

Data Quality Review: Trained PCC specialists review the case data and, based on the information provided and their knowledge of toxicology, doses, and timing of exposure, ascertain whether the incident was caused by pesticides.

Data Limitations: Experts believe pesticide poisonings are under-reported to surveillance sources, for reasons, including the symptoms of pesticide poisoning generally are difficult to identify; there are few biomarkers for pesticides; and because the exposed individual may not seek medical care or report their illness. Additionally, not all states require mandatory physician reporting, and those that do may have difficulty enforcing that requirement.

Error Estimate: As mentioned above, under-reporting is believed to be a problem in all pesticide incident data sets. There are a number of widely-ranging estimates for the amount of under-reporting, ranging from 25% to as much as a factor of a thousand.

New/Improved Data or Systems: OPP collects pesticide incident data under FIFRA section 6(a)2. FIFRA is the Federal Insecticide, Fungicide and Rodenticide Act; the statute which governs the program functions. Section 6(a)2 is mandatory reporting required of the registrants (registrants are those who have or seek registration of their pesticide products). However, details important to this measure are not routinely captured in this data set. We hope to improve the internal data systems that capture incidents reported by the regulated community. Currently, data are difficult to use and may not have needed detail. If these data were available, they could potentially be used to complement or replace the PCC/TESS data, depending on their quality.

References: none

<u>FY 2011 Performance Measure:</u>

- **Percent reduction in concentrations of pesticides detected in general population (program assessment measure)**

Performance Database: The Agency will use the Centers for Disease Control's (CDC's) National Health and Nutrition Examination Survey (NHANES) data from 1999-2002 as the baseline. For this measure, the Agency intends to report on the changes in potential organophosphate pesticide exposure, based on levels of the non-specific organophosphate dialkyl phosphate metabolites and the chlorpyrifos-specific metabolite 3,5,6-Trichloro-2-pyridinol at the 50th percentile. The Agency selected the 50th percentile because it is a central tendency value with smaller inherent variability than higher percentiles. However, the Agency recognizes that an accurate estimate of the 50th percentile cannot be calculated if 50 percent of the observations are below the LOD. Therefore, the Agency may adopt an alternative approach, such as selecting the 75th percentile, if a sufficient number of observations are not above the LOD.

Data Sources: NHANES (see above)

Methods, Assumptions and Suitability: The NHANES data were selected because the surveys provide a statistically representative data set for the entire U.S. population. It is an ongoing program, with funding from numerous cooperating Federal agencies. The data are based on measurement of chemical levels in blood and urine.

QA/QC Procedures: This large scale survey is performed in strict compliance with CDC QA/QC procedures.

Data Quality Review: The measure will utilize NHANES data. NHANES is a major program of the National Center for Health Statistics (NCHS). NCHS is part of the Centers for Disease Control and Prevention (CDC), U.S. Public Health Service, and has the responsibility for producing vital and health statistics for the Nation. The National Center for Health Statistics (NCHS) is one of the Federal statistical agencies belonging to the Interagency Council on Statistical Policy (ICSP). The ICSP, which is led by the Office of Management and Budget (OMB), is composed of the heads of the Nation's 10 principal statistical agencies plus the heads of the statistical units of 4 non-statistical agencies. The ICSP coordinates statistical work across organizations, enabling the exchange of information about organization programs and activities, and provides advice and counsel to OMB on statistical activities. The statistical activities of these agencies are predominantly the collection, compilation, processing or analysis of information for statistical purposes. Within this framework, NCHS functions as the Federal agency responsible for the collection and dissemination of the Nation's vital and health statistics. Its mission is to provide statistical information that will guide actions and policies to improve the health of the American people.

To carry out its mission, NCHS conducts a wide range of annual, periodic, and longitudinal sample surveys and administers the national vital statistics systems.

As the Nation's principal health statistics agency, NCHS leads the way with accurate, relevant, and timely data. To assure the accuracy, relevance, and timeliness of its statistical products, NCHS assumes responsibility for determining sources of data, measurement methods, methods of data collection and processing while minimizing respondent burden; employing appropriate methods of analysis, and ensuring the public availability of the data and documentation of the methods used to obtain the data. Within the constraints of resource availability, NCHS continually works to improve its data systems to provide information necessary for the formulation of sound public policy. As appropriate, NCHS seeks advice on its statistical program as a whole, including the setting of statistical priorities and on the statistical methodologies it uses. NCHS strives to meet the needs for access to its data while maintaining appropriate safeguards for the confidentiality of individual responses.

Three web links to background on data quality are below:
http://www.cdc.gov/nchs/about/quality.htm
http://www.cdc.gov/nchs/data/nhanes/nhanes_01_02/lab_b_generaldoc.pdf#search=%22quality%20control%20NHANES%22

http://www.cdc.gov/nchs/data/nhanes/nhanes_03_04/lab_c_generaldoc.pdf#search=%22quality%20NHANES%22

Data Limitations: Some limitations include that not all pesticides are included, it is a measure of exposure instead of risk, and there is a time-lag between EPA actions and the CDC's analysis of the data.

Error Estimate: There is the potential of identifying metabolites that comes from both a pesticide and another source.

New/Improved Data or Systems: Not known at this time.

References: Third National Report on Human Exposure to Environmental Chemicals 2005, CDC/National Center for Environmental Health/Environmental Health Laboratory http://www.cdc.gov/nchs/about/nhanes

FY 2011 Performance Measure:

- **Average cost and average time to produce or update an Endangered Species Bulletin (program assessment efficiency)**

Performance Database: The Bulletins Live! application is enabled by a multi-user relational database system that maintains a permanent archive with dates of the draft and final content for each endangered species protection Bulletin that is created or updated in the system. When the Bulletins Live! application is made available to the public, EPA will take over the complete Bulletin production process, which is currently carried out by the United States Geological Survey (USGS) staff through an Interagency Agreement (see below). Additionally, tracking and summary reporting of all endangered species mitigation actions including the time between which a decision is made to issue a Bulletin and its availability to the public will be made available as a part of the OPP "PRISM" information system that is planned for development in FY 2007. This system will track the staff working on mitigation development and bulletin production, and the time spent on these activities, allowing for a calculation of the cost per bulletin issued with Bulletins Live!

Data Source: The data necessary to track progress towards the targets for this measure are currently being collected by EPA. The Bulletins are being developed for EPA by the U.S. Geological Survey (USGS) Cartography and Publishing Program under an Interagency Agreement (IAG) with OPP. The data will be collected annually through the end-of-year report under the Interagency Agreement (IAG). The baseline year will be 2004 cost and time averages ($4000.00 and 100 hours per Endangered Species Bulletin production or update).

Methods, Assumptions and Suitability: These Bulletins are a critical mechanism for ensuring protection of endangered and threatened species from pesticide applications

Bulletins are legally enforceable extensions to pesticide labels that include geographically specific use limitations for the protection of endangered species. The faster the Bulletins can be developed, the earlier the protections are available to endangered and threatened species. Similarly, the less it costs to produce the Bulletins, the more Bulletins can be produced within available budget and the greater the impact on saving endangered and threatened species.

This measure is calculated as follows:

> 100 – [(Sum of the costs to produce or update Endangered Species Bulletins in current 12 month period/number of bulletins produced or updated in the same 12 month period)/(Sum of the costs to produce or update Endangered Species Bulletins in previous 12 month period) X 100] This is intended to be a measure that captures improvements in current year cost per bulletin vs. previous year cost per bulletin.
>
> 100 – [(Sum of the time in hours to produce or update Endangered Species Bulletins in current 12 month period/number of bulletins produced or updated in the same 12 month period)/(Sum of the time in hours to produce or update Endangered Species Bulletins in previous 12 month period/number of bulletins produced or updated in the previous 12 month period) X 100]

QA/QC Procedures: EPA adheres to its approved Quality Management Plan to ensure the overall quality of data in the Bulletins Live! system. Bulletins pass through a multi-level quality control and review process before being released to the public. After the initial Bulletin is created by trained staff in the Endangered Species Protection Program, the draft is automatically routed in the system to a senior staff member who reviews the information in the Bulletin as a quality control check. After this Agency review, Bulletins are then subject to review and comment by Regional and State regulatory partners responsible for different aspects of the field implementation program and Bulletin enforcement.

Data Quality Reviews: Data quality reviews for the Bulletins themselves are ongoing through the QA/QC methodology described above. Data quality reviews for components of the measure (time per bulletin and cost per bulletin) will be carried out by the Project Officers who manage the Bulletins Live! and PRISM systems.

Data Limitations: N/A

Error Estimate: N/A

New/Improved Data or Systems: The web-based Bulletins Live! system will facilitate the expedited production and delivery of endangered species protection Bulletins as compared to the 2004 baseline.

References:

Endangered Species Protection Program website and Bulletins Live!: http://www.epa.gov/espp; QMP: Quality Management Plan for the Office of Pesticides Program, February 2006; Endangered Species Act.

FY 2011 Performance Measure:

- **Reduce cost per acre using reduced risk pest management practices compared to the grant and/or contract funds expended on environmental stewardship (program assessment efficiency)**

Performance Database: Strategic Agricultural Initiative (SAI) database contains the SAI grants funds and acreage data. We are going to track the number of acres, by particular crop, under reduced risk pest management that was funded as part of a grant and/or contract. This database is currently on the web site of our cooperator, the American Farmland Trust. Eventually, Pesticide Environmental Stewardship Program (PESP) data will be included. PESP data are those reported to EPA in grant reports. We look at the adoption rate of reduced risk pesticides and compare it to the cost of the grant. The performance data are the acres impacted by the project verses the amount of grant or contract funds.

Data Source: Reports from grantees and contractors will be used as well as available databases to track the adoption of safer pest management practices. Such data sources include the USDA National Agricultural Statistics Service's surveys, Doane Marketing Research data, and pesticide usage records provided by user groups. Agricultural pesticide user groups who are members of PESP frequently report their use of safer pest management practices as part of their annual reports

Methods, Assumptions and Suitability: Each grantee or contractor is required to provide reports on their project including the success of adoption of safer pest management practices. For SAI grants, the SAI Coordinator in each of the 10 EPA Regional Offices enters the results from the SAI grants into the SAI database. The SAI Coordinator at EPA Headquarters encourages the Regional Coordinators to do this in a timely fashion. EPA Headquarters' Project Officer of the PESP grant serves the same function, making sure interim and final reports are provided to EPA without delay. EPA will track the adoption of new practices using publicly and commercially available databases, such as those described above. At times, data also are available on the adoption of a particular biopesticide or other reduced risk pesticide from the registrant of that product or from a user group that is adopting the new technology. This data can be very useful in tracking adoption in the early stages or in cases where little data is available, such as for minor crops. Data supplied by registrants can be compared to information supplied to EPA under Section 7 of FIFRA to identify major errors, but it would be hard to identify minor errors or flaws in the data.

QA/QC Procedures: EPA QA/QC procedures are followed for each grant and/or contract where environmental data is being collected. Part of the Agency's Quality Management Plan requires that grantees and/or contractors have a QA/QC program in

place before the grant/contract is awarded. A staff member, typically the project officer for the grant or contract, typically often conducts onsite visits every year to ensure QA/QC procedures is being followed. Typically, field trials and demonstrations are visited by the Regional SAI Coordinators or the EPA grantee for PESP work. Data from other internal and external sources, where available, will be used to determine the validity of the information provided by registrants and grower groups.

Data Quality Reviews: Staff and management of the Environmental Stewardship Branch and the Regional SAI Coordinators will perform data quality reviews under the leadership of program QA/QC officers.

Data Limitations: Major pesticide usage surveys will likely miss minor usages. Voluntary reporting by grantees and grower groups on the use of their reduced risk pest management practices introduces more error/bias than if a statistically valid sample were taken. However, funding and managing this kind of sample survey will be a challenge.

Error Estimate: Error estimates for established databases such as Doane and NASS surveys are documented by these organizations in their survey reports. Audits of grants are intended to reduce errors, but best estimates may be relied upon when statistically valid samples are not available.

New/Improved Data or Systems: EPA will improve the existing SAI database by including PESP data or will create a comparable database to track the PESP data.

References:http://www.epa.gov/oppbppd1/PESP/and
http://www.aftresearch.org/sai/collaborations

FY 2011 Performance Measures:

- **Percent of decisions completed on time (on or before PRIA or negotiated due date)**
- **Maintain timeliness of Section 18 Emergency Exemption Decisions**

Performance Database: The Pesticide Registration Improvement Act (PRIA) of 2003 established .pesticide registration service fees for registration actions. The Pesticide Registration Improvement Renewal Act (PRIA 2), effective October 1, 2007, reauthorized the PRIA for five more years until 2012. The PRIA 2 legislation increased the number of actions covered by fees, modified the payment process and application in-processing. The category of action, the amount of pesticide registration service fee, and the corresponding decision review periods by year are prescribed in these statutes. Their goal is to create a more predictable evaluation process for affected pesticide decisions, and couple the collection of individual fees with specific decision review periods. They also promote shorter decision review periods for reduced-risk applications. PRISM (Pesticide Registration Information System) consolidates various pesticides program databases. It is maintained by the EPA and track regulatory data submissions and studies, organized by scientific discipline, which are submitted by the registrant in support of a

pesticide's registration. All registration actions received under the PRIA and PRIA 2 are entered and tracked in PRISM. In addition to being entered into PRISM, Section 18 actions are also tracked in a separate database which is used to populate a searchable web page linked to the main Office of Pesticide Programs web page. S18 timeliness was reported on a FY basis for the first time in FY 2005.

Data Source: PRISM, Section 18 database

Methods, Assumptions and Suitability: The measures are program outputs which represent the program's statutory requirements to ensure that pesticides entering the marketplace are safe for human health and the environment, and when used in accordance with the packaging label present a reasonable certainty of no harm. In addition, under PRIA and PRIA 2 , there are specific timelines, based on the type of registration action, by which the Agency must make a decision. These laws do allow the decision due date under PRIA to be negotiated to a later date, after consultation with and agreement by the submitter of the application. The timeliness measure represents the Agency's effectiveness in meeting these PRIA timelines.

QA/QC Procedures: All registration actions must employ sound science and meet the Food Quality Protection Act (FQPA) safety standards. All risk assessments are subject to public and scientific peer review. The office adheres to its Quality Management Plan (Nov. 2006) in ensuring data quality and that procedures are properly applied.

Data Quality Review: The Agency employs continuous monitoring of the status of PRIA decisions. Numerous internal Agency meeting continue to monitor workload and compliance with PRIA due dates. Throughout the pesticide registration program, weekly meetings are held to review the status of pending decisions, due date extensions, and refunds; to identify potential issues and target their resolution; to resolve fee category questions; and to coordinate schedules with science support organizations. Senior managers review justifications and make final decisions to extend of negotiate a PRIA due date and whether or not to issue a "PRIA Determination to Not Grant" a registration. On a bi-monthly basis, progress in meeting PRIA due dates and the short term pending workload are evaluated across all involved organizations and periodically shared with stakeholder groups.

Data Limitations: None **known**

Error Estimate: N/A

New/Improved Data or Systems: Reports developed in Business Objects (using PRISM as the data source) allow senior management to more effectively track the workload (e.g., pending actions with upcoming PRIA due dates, actions for which the PRIA date appears to have passed etc.) and ensure that PRIA or negotiated due dates are met.

References:
http://www.epa.gov/pesticides/fees/

FIFRA Sec 3(c)(5); FFDCA Sec 408(a)(2); Food Quality Protection Act (FQPA) 1996; Pesticide Registration Improvement Act (PRIA) 2003; Pesticide Registration Improvement Renewal Act (PRIA 2) 2007

FY 2011 Performance Measure:

- **Number of Product Reregistration Decisions**
- **Number of pesticide registration review dockets opened**
- **Number of pesticide registration review final work plans completed**

Performance Database: OPP's Reevaluation process includes Product Reregistration and Registration Review. The Product Reregistration process is scheduled to be completed in 2014, while the Registration Review process will be in full operation at that time. Major milestones are tracked in the Pesticide Registration Information System (PRISM). PRISM is maintained by EPA and tracks regulatory data submissions and studies, organized by scientific discipline, which are submitted by the registrant in support of a pesticide's registration review. Actions are entered in PRISM as they occur and reported on a fiscal year basis. In addition manual counts are maintained by the office.

Data Source: EPA's Pesticides Program, PRISM, and Manual Systems.

Methods, Assumptions and Suitability: The measures are program outputs which represent the program's statutory requirements to ensure that approved pesticides remain safe for human health and the environment. While program outputs do not directly measure risk reduction, they do reflect progress made toward reducing risk. In 1988, Congress amended the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) requiring EPA to evaluate all pesticides registered prior to November 1984 to assure that they meet current safety standard and are supported with high quality data. The review of all the active ingredients (AIs) was completed in October 2008. Over the next five years, registrants will be required to submit product specific data and new product labels to comply with the decisions on the AIs. OPP's review and approval (or cancellation) process of each individual product label is referred to as Product Reregistration. Product Reregistration is scheduled for completion in 2014. The Food Quality Protection Act of 1996 directed EPA to establish a Registration Review program with the goal of reviewing all registered pesticides, AIs and products, on a 15-year cycle to ensure that they continue to meet the standards of registration. EPA issued the final rule in 2006 and began implementing the program in 2007. Under the rule, EPA posts registration review schedules and these will provide a baseline for expected AI case dockets that will be opened for the next three year cycle and for decisions expected over the next several years. The first step of Registration Review is to open a public docket for each pesticide case entering the process to show the public what the Agency knows about the AI and seek comment. When comments are evaluated and data needs are finalized, OPP posts a Final Work Plan (FWP) for each AI case. Although the docket openings and the FWPs are tracked, both steps require notable resources to complete.

QA/QC Procedures: All registrations must be based on sound science and meet the Food Quality Protection Act (FQPA) safety standard. All risk assessments are subject to public and scientific peer review. In addition, OPP management reviews and signs new documents before being placed in the docket or posted on EPA's website.

Data Quality Review: Management reviews the program counts and signs off on the decision document.

Data Limitations: None known.

Error Estimate: N/A. There are no errors associated with count data.

New/Improved Data or Systems: EPA recently constructed a module in PRISM tracking major Registration Review milestones. This module enhances tracking capabilities and is an important management tool.

References: EPA Website: http://www.epa.gov/oppsrrd1/registration_review/ ("Registration Review: A Periodic Look at Old Pesticides");

FY 2011 Performance Measure:

- **Percentage of agricultural acres treated with reduced-risk pesticides (program assessment measure)**

Performance Database: EPA uses an external database, Doane Marketing Research (DMR) data, for this measure. The data have been reported for trend data since FY 2001 on an FY basis.

Data Source: Primary source is Doane Marketing Research, Inc. (a private sector research database). The database contains agricultural pesticide usage information by pesticide, year, crop use, acreage and sector.

Methods, Assumptions and Suitability: A reduced-risk pesticide must meet the criteria set forth in Pesticide Registration Notice 97-3, September 4, 1997. Reduced-risk pesticides include those which reduce the risks to human health; reduce the risks to non-target organisms; reduce the potential for contamination of groundwater, surface water, or other valued environmental resources; and/or broaden the adoption of integrated pest management strategies or make such strategies more available or more effective. In addition, biopesticides are generally considered safer (and thus reduced-risk). EPA's statistical and economics staff review data from DMR. Information is also compared to prior years for variations and trends as well as to determine the reasons for the variability.

DMR sampling plans and QA/QC procedures are available to the public at their website. More specific information about the data is proprietary and a subscription fee is required. Data are weighted and a multiple regression procedure is used to adjust for known disproportionalities (known disproportionality refers to a non proportional sample, which

means individual respondents have different weights) and ensure consistency with USDA and state acreage estimates.

QA/QC Procedures: All registration actions must employ sound science and meet the Food Quality Protection Act (FQPA) new safety standard. All risk assessments are subject to public and scientific peer review. DMR data are subject to extensive QA/QC procedures, documented at their websites. In ensuring the quality of the data, EPA's pesticide program adheres to its Quality Management Plan (QMP), approved November, 2006.

The main customers for the DMR pesticide usage data are the pesticide registrants. Since those registrants know about sales of their own products, they have an easy way to judge the quality of Doane provided data. If they considered the quality of the data to be poor, they would not continue to purchase the data.

Data Quality Review: The DMR data are subject to extensive internal quality review, documented at the website. EPA's statistical and economics staff review data from DMR. Information is also compared to prior years for variations and trends as well as to determine the reasons for the variability. For some crops and states, comparisons are also made with a more limited pesticide usage database from the National Agricultural Statistics Service of the United States Department of Agriculture (USDA).

Data Limitations: DMR data are proprietary; thus in order to release any detailed information, the Agency must obtain approval from the company. There is a data lag of approximately 12-18 months, due to the collection of data on a calendar year (CY) basis, time required for DMR to process data, lead time for EPA to purchase and obtain data, plus the time it takes to review and analyze the data within the office's workload.

Error Estimate: Error estimates differ according to the data/database and year of sampling. This measure is compiled by aggregating information for many crops and pesticides. While considerable uncertainty may exist for a single pesticide on a single crop, pesticide use data at such a highly aggregated level are considered quite accurate. DMR sampling plans and QA/QC procedures are available to the public at their website. More specific information about the data is proprietary and a subscription fee is required. Data are weighted and multiple regression procedure is used to adjust for known disproportionalities and ensure consistency with USDA and state acreage estimates.

New/Improved Data or Systems: These are not EPA databases; thus improvements are not known in any detail at this time.

References: EPA Website; EPA Annual Report; Annual Performance Plan and Annual Performance Report, http://www.ams.usda.gov/science/pdp/download.htm; Doane Marketing Research, Inc.: http://www.doanemr.com; http://www.usda.gov/nass/pubs and http://www.usda.nass/nass/nassinfo; FFDCA Sec 408(a)(2); EPA Pesticide Registration Notice 97-3, September 4, 1997; Endangered Species Act.

FY 2011 Performance Measure:

- **Percent of agricultural watersheds that do not exceed the National Pesticide Program aquatic life benchmarks for two pesticides of concern (azinphos-methyl and chlorpyrifos.)**

Performance Database: Baseline data are obtained from the United States Geological Survey (USGS) National Water-Quality Assessment (NAWQA) program's 2006 report: Pesticides in the Nation's Streams and Ground Water, 1992-2001 (http://ca.water.usgs.gov/pnsp/). Future data will be compiled from future reports.

Data Source: Baseline data are derived from the USGS National Water-Quality Assessment (NAWQA) program's 2006 report: Pesticides in the Nation's Streams and Ground Water, 1992-2001. USGS is currently developing sampling in its second cycle (cycle II) from 2002-2012. Data are available to the public on the USGS-NAWQA website from the (http://water.usgs.gov/nawqa/). USGS is currently developing sampling plans for 2013 – 2022. Future data will be available from USGS as it is made available on public websites.

Methods, Assumptions and Suitability: Water quality is a critical endpoint for measuring exposure and risk to the environment. It is a high-level measure of our ability to reduce exposure from key pesticides of concern. This measure evaluates the reduction in water concentrations of pesticides as a means to protect aquatic life. Reduced water column concentration is a major indicator of the efficacy of risk assessment, risk management, risk mitigation and risk communication actions. It will illuminate program progress in meeting the Agency's strategic pesticide and water quality goals.

The goal is to develop long-term consistent and comparable information on the amount of pesticides in streams, ground water, and aquatic ecosystems to support sound management and policy decisions. USGS-NAWQA data can help inform EPA of the long-term results of its risk management decisions based on trends in pesticide concentrations. Monitoring plans call for yearly monitoring in 8 agricultural watersheds; bi-yearly sampling in 3 agricultural dominated watersheds; and sampling every four years in a second set of 25 agricultural watersheds. The sampling frequency for these sites will range from approximately 13 to 26 samples per year depending on the size of the watershed and the extent of pesticide use period. Sampling frequency is seasonally weighted so more samples are collected when pesticide use is expected to be highest. USGS is currently developing sampling plans for 2013 – 2022.

QA/QC Procedures: EPA adheres to its approved Quality Management Plan in ensuring the quality of the data obtained from USGS. The data that will be used for the outcome measure is based on well-established QA-QC procedures in the USGS-NAWQA program (http://ca.water.usgs.gov/pnsp/rep/qcsummary/ and http://water.usgs.gov/owq/FieldManual/index.html).

Data Quality Review: The measure will utilize USGS NAWQA data. USGS is preeminent in the field of water quality sampling. Since 1991, the USGS NAWQA program has been collecting and analyzing data and information in major river basins and aquifers across the Nation. The program has undergone periodic external peer-review (http://dels.nas.edu/water/monitoring.php).

Data Limitations: These data continue to be evaluated and data limitations will be characterized during developmental stages of the measure and a complete evaluation will be provided in the NAWQA 2011 "Cycle II" Study Report. EPA has requested that USGS add additional insecticides to their sampling protocols to establish base line information for newer products that have been replacing the organophosphates (e.g., the synthetic pyrethroids). Although the USGS has performed a reconnaissance of pyrethoids occurrence in bed sediment, there is not currently a comprehensive monitoring strategy.

Error Estimate: The USGS database provides estimates of analytical methods and associated variability estimates (http://ga.water.usgs.gov/nawqa/data.qa.html).

New/Improved Data or Systems: This measure will utilize existing data and data systems.

References: USGS National Water-Quality Assessment (NAWQA) program's 2006 report: Pesticides in the Nation's Streams and Ground Water, 1992-2001.

The NAWQA 2011 "Cycle II" Study Report does not exist at this time – the sampling is in progress, thus there is no citation at this time.

FY 2011 Performance Measure:

- **Percent reduction of children's exposure to rodenticides**

Performance Database:
Most of the nation's Poison Control Centers (PCCs) participate in a national data collection system known as the National Poisoning Data System (NPDS). Among the types of exposures reported are pesticide related incidents in both residential and occupational settings. The data collected include date of call, age, gender, location of exposure, route of exposure, substance exposed to, initial symptom assessment, treatment received and an evaluation of the medical outcome.

Data Sources:
NPDS, formerly known as the Toxic Exposure Surveillance System (TESS), is one of the most comprehensive sources of surveillance data on poisonings in the United States. NPDS is a uniform database of PCCs, which are members of the American Association of Poison Control Centers (AAPCC), and are distributed throughout the United States. The database was established in 1985 and now includes information on more than 36

million exposure cases. In 2006, 61 PCCs received more than 4 million cases, including more than 2.4 million human exposure cases and 1.4 million informational calls.

NPDS is a valuable public health resource and has been utilized to identify hazards, develop education priorities, guide clinical research, and identify chemical and bioterrorism incidents. As a result, NPDS has helped prompt product reformulations, recalls, and bans, support regulatory actions, and provide post-marketing surveillance of new drugs.[4]

Each individual PCC provides 24-hour emergency medical information on the diagnosis and treatment of poisonings. The calls are managed primarily by AAPCC-certified Specialists in Poison Information (SPIs), who are typically pharmacists and nurses and have managed at least 2,000 calls. SPIs are required to complete detailed electronic medical records for both exposure and informational calls. The electronic medical records include general demographic information, including age, gender, location of exposure, and more detailed information if an exposure may have occurred, including suspected substance, reason for exposure, route of exposure, management site, symptoms, and medical outcome. To assist SPIs and ensure database uniformity, many of the fields included in the electronic medical records use categories that have been defined by the AAPCC. For example, SPIs characterize the medical severity of possible exposures using the medical outcome field, which includes the AAPCC-defined categories "None," "Minor," "Moderate," "Major," or "Death." Additionally, the records may also contain several open fields, which allow SPIs to record additional information that may be relevant to the treatment and diagnosis of each case. The information recorded by SPIs is managed by each PCC and then uploaded to NPDS every one to sixty minutes, creating a real-time national exposure surveillance system. For this measure, all confirmed exposures involving children less than six-years old are included, regardless of medical outcome or severity.

Methods, Assumptions and Suitability: OPP assumes resources will continue to be available for the Agency to purchase the data and that adequate resources will be available at the local level to continue to fund the centers. The reduction in exposures is expected to result from mitigation measures made as part of OPP's re-evaluation programs, from greater availability of lower risk alternative products resulting from the Agency's reduce risk registration process, from the continued implementation of worker protection enforcement and training.

QA/QC Procedures: PCCs must be certified by the American Association of Poison Control Centers (AAPCC). To be certified a PPC must have a board certified physician on call at all times, have AAPCC certified specialists available to handle all calls, have a comprehensive file of toxicology information readily available, maintain Standard Operating Procedures (SOPs), keep records on all cases and have an ongoing quality assurance program. In addition, EPA staff screen each case before analyzing the data set.

---

[4] Bronstein AC, DA Spyker, LR Cantilena, J Green, BH Rumack, SE Heard. 2006 Annual Report of the American Association of Poison Control Centers' National Poison Data System. *Clinical Toxicology* (2007) 45, 815–917.

Data Quality Review: EPA conducts regular case reviews and audits to assure quality assurance of data collected. Also, as mentioned above, EPA staff reviews each case before entering into its database.

Data Limitations: Because PCC participation is voluntary and the available resources vary from year to year, the data contains uncertainty.

Error Estimate: Because the incidents are self-reported, there is a potential bias in the data. However, there is no reason to believe that the bias will change from year to year

New/Improved Data or Systems: Not known at this time.

References: Poison Control Centers National Poisoning Data System (NPDS)
http://www.aapcc.org/poison1.htm

FY 2011 Performance Measure:

- **Annual number of chemicals with final Acute Exposure Guideline Levels (AEGLs) values (program assessment)**

Performance Database: Performance is measured by the annual number of chemicals with Final AEGL values as recorded in the AEGL Chemical Status sans Structure Access 2000 database containing the approval dates for final AEGL values. The results are calculated on a fiscal year basis.

Data Source: EPA manages a Federal Advisory Committee Act (FACA) committee that reviews short term exposure values for extremely hazardous chemicals. The supporting data, from both published and unpublished sources and from which the AEGL values are derived, are collected, evaluated, and summarized by FACA Chemical Managers and contractors (currently Oak Ridge National Laboratory's scientists – this work has shifting to a competed contract. Proposed AEGL values are published for public comment in the Federal Register. After reviewing public comment, interim values are presented to the AEGL Subcommittee of the National Academy of Sciences (NAS) for review and comment. After review and comment resolution, the National Research Council under the auspices of the National Academies (NAS) publishes the values as final. Although proposed AEGLs are not considered final until so designated by the NAS, the proposed values are suitable for many purposes. This performance measure is tied to final values because EPA has completed work in developing proposal AEGL values. EPA's contract gives us more control over finalizing AEGL values. In FY2009 and almost exclusively in FY2011, in-house and financial resources will increasingly be devoted to finalizing AEGL chemicals through the NAS.

Methods and Assumptions: The work of the National Advisory Committee's Acute Exposure Guideline Levels (NAC/AEGL, formally chartered under the Federal Advisory

Committee Act) adheres to the 1993 U.S. National Research Council/National Academies of Sciences (NRC/NAS) publication *Guidelines for Developing Community Emergency Exposure Levels for Hazardous Substances*. NAC/AEGL, in cooperation with the National Academy of Sciences' Subcommittee on AEGLs, has developed standard operating procedures (SOPs), which are followed by the program. These have been published by the National Academy Press and are referenced below. The number of AEGL values approved as "final" by the NAC/AEGL FACA Committee represents the measure of performance. The data meet the standards in the QMP and the outcomes are reviewed by senior management.

Suitability: This output measure supports the long term goal of assigning proposed Acute Exposure Guideline Levels for all priority chemicals by 2011.

QA/QC Procedures: OPPT has in place a signed Quality Management Plan ("Quality Management Plan for the Office of Pollution Prevention and Toxics; Office of Prevention, Pesticides and Toxic Substances," November 2008) Like the 2003 QMP, it will ensure the standards and procedures are applied to this effort. QA/QC procedures, specific to AEGLs, include public comment via the Federal Register process; review and approval by the FACA committee; and review and approval by the NAS/AEGL committee and their external reviewers.

Data Quality Review: Not applicable. The counts used as a basis for this measure are fully transparent.

Data Limitations: No specific data limitations have been identified with respect to the information relied upon in developing or reporting this measure.

Error Estimate: Not applicable. This measure does not require inferences from statistical samples and therefore there is no estimate of statistical error.

New/Improved Data or Systems: Access databases, spreadsheets and other files are maintained and improved on an ongoing basis.

References: Standing Operating Procedures for Developing Acute Exposure Guideline Levels for Hazardous Chemicals, National Academy Press, Washington, DC 2001 (http://www.nap.edu/books/030907553X/html/). NRC (National Research Council). 1993. Guidelines for Developing Community Emergency Exposure Levels for Hazardous Substances. Washington, DC: National Academy Press.
AEGL Program website at http://www.epa.gov/oppt/aegl

FY 2011 Performance Measures:

- **Percent of children (aged 1-5 years) with elevated blood lead levels (> 10 ug/dL) (program assessment measure)**

- **Percent difference in the geometric mean blood level in low-income children 1-5 years old as compared to the geometric mean for non-low income children 1-5 years old. (program assessment measure)**
- **Percent of children (aged 1-5 years) with elevated blood lead levels (> 5 ug/dL)**

Performance Database: Data from the Centers for Disease Control and Prevention's (CDC) National Health and Nutrition Examination Survey (NHANES) is recognized as the primary database in the United States for national blood lead statistics. NHANES is a probability sample of the non-institutionalized population of the United States. Data are collected on a calendar year basis, and are currently released to the public in two year sets. Blood lead levels are measured for participants who are at least one year old. The survey collects information on the age of the participant at the time of the survey.

Data Source: The National Health and Nutrition Examination Survey is a survey designed to assess the health and nutritional status of adults and children in the U.S. The survey program began in the early 1960s as a periodic study, and continues as an annual survey. The survey examines a nationally representative sample of approximately 5,000 men, women, and children each year located across the U.S. CDC's National Center for Health Statistics (NCHS) is responsible for the conduct of the survey and the release of the data to the public. NCHS and other CDC centers publish results from the survey, generally in CDC's Morbidity and Mortality Weekly Report (MMWR), but also in scientific journals. In recent years, CDC has published a National Exposure report based on the data from the NHANES. The most current National Report on Human Exposure to Environmental Chemicals was released July 2005, and is available at the Web site http://www.cdc.gov/exposurereport/. More recent performance results were published in a March 2009 Pediatrics journal article. http://pediatrics.aappublications.org/cgi/content/abstract/123/3/e376 Performance results will be updated as new peer reviewed NHANES data is published either in the official CDC report on human exposure to environmental chemicals or other journal articles as the data become available.

Methods and Assumptions: Detailed interview questions cover areas related to demographic, socio-economic, dietary, and health-related questions. The survey also includes an extensive medical and dental examination of participants, physiological measurements, and laboratory tests. Specific laboratory measurements of environmental interest include: metals (e.g. lead, cadmium, and mercury), VOCs, phthalates, organophosphates (OPs), pesticides and their metabolites, dioxins/furans, and polyaromatic hydrocarbons (PAHs). NHANES is unique in that it links laboratory-derived biological markers (e.g. blood, urine etc.) to questionnaire responses and results of physical exams. For this performance measure, NHANES has been recognized as the definitive source. Estimates of the number of children 1-5 years with an elevated blood lead level based on NHANES have been published by CDC (See http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5420a5.htm). Analytical guidelines issued by NCHS provide guidance on how many years of data should be combined for an analysis. The NHANES data directly estimate the values included in the two performance measures and are nationally recognized as the best source of this data. This

data source measures blood levels in the same units (i.e., ug/dL) and at standard detection limits.

Suitability: The first measure supports the long-term goal of eliminating childhood lead poisoning as a public health concern by the year 2010 and continuing to maintain the elimination of childhood lead poisoning over time. The second measure examines the disparities of blood lead levels in low-income children compared to non low-income children and uses this measure to track progress towards EPA's long-term goal of eliminating childhood lead poisoning in harder to reach vulnerable populations.

QA/QC Procedures: Background documentation is available at the NHANES Web site at http://www.cdc.gov/nchs/nhanes.htm. The analytical guidelines are available at the Web site http://www.cdc.gov/nchs/about/major/nhanes/nhanes2003-2004/analytical_guidelines.htm.

Data Quality Reviews: CDC follows standardized survey instrument procedures to collect data to promote data quality, and data are subjected to rigorous QA/QC review. Additional information on the interview and examination process can be found at the NHANES web site at http://www.cdc.gov/nchs/nhanes.htm.

Data Limitations: NHANES is a voluntary survey and selected persons may refuse to participate. In addition, the NHANES survey uses two steps, a questionnaire and a physical exam. There are sometimes different numbers of subjects in the interview and examinations because some participants only complete one step of the survey. Participants may answer the questionnaire but not provide the more invasive blood sample. Special weighting techniques are used to adjust for non-response. Seasonal changes in blood lead levels cannot be assessed under the current NHANES design. Because NHANES is a sample survey, there may be no children with elevated blood lead levels in the sample, but still some children with elevated blood lead levels in the population.

Error Estimate: Because NHANES is based on a complex multi-stage sample design, appropriate sampling weights should be used in analyses to produce estimates and associated measures of variation. Recommended methodologies and appropriate approaches are addressed in the analytical guidelines provided at the NHANES Web site http://www.cdc.gov/nchs/about/major/nhanes/nhanes2003-2004/analytical_guidelines.htm.

New/Improved Data or Systems: NHANES has moved to a continuous sampling schedule, scheduled release of data, and scheduled release of National Exposure reports by CDC.

References: 1) the NHANES Web site, http://www.cdc.gov/nchs/nhanes.htm; 2) the Third National Report on Human Exposure to Environmental Chemicals Web site, http://www.cdc.gov/exposurereport/; 3) Morbidity and Mortality Weekly Report (MMWR) article with the most recent estimate of the number of children with elevated

blood lead levels, http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5420a5.htm; 4) NHANES Analytical Guidelines,http://www.cdc.gov/nchs/about/major/nhanes/nhanes2003-2004/analytical_guidelines.htm.

FY 2011 Performance Measure:

- **Annual percentage of lead-based paint certification and refund applications that require less than 20 days of EPA effort to process (program assessment efficiency measure)**
- **Cumulative number of certified Renovation, Repair and Painting (RRP) Firms**

Performance Database: The National Program Chemicals Division (NPCD) in the Office of Pollution Prevention and Toxics (OPPT) maintains the Federal Lead-Based Paint Program (FLPP) database. Records are maintained for both the abatement and Renovation Repair and Painting programs in States where the program is directly implemented by EPA.

Processing abatement applications: The FLPP electronic database contains applications for certification by individuals and firms and applications for accreditation by training providers in states and tribal lands administered by the Federal lead abatement program. The database provides a record of all applications for certification or accreditation for Federally-managed lead programs and the actions on those applications including final decisions and the multiple steps in the process used for measurement. The database is augmented by hard copy records of the original applications. EPA uses an Oracle Discoverer application to query the database to collect measurable performance data.

RRP Firms: The FLPP database was recently expanded to also track the certification of firms for Renovation Repair and Painting where EPA directly implements the program. EPA uses an Oracle Discoverer application to query the database to collect measurable performance data.

Data Source:
Processing Abatament applications: The FLPP database is available internally to EPA Headquarters, the federal program contractors and Regional lead program staff who process the applications or oversee the processing. The database is maintained on EPA servers at the National Computer Center (NCC) located in Research Triangle Park (RTP), North Carolina. Access to the database is granted by the Lead, Heavy Metals, and Inorganics Branch (LHMIB) in NPCD. Overall maintenance of the database and periodic improvements are handled by a contractor, currently HeiTech Corporation, located in Landover, Maryland. Data entry of application data is conducted by a second contractor, currently Optimus Corporation, located in Silver Spring, Maryland. Optimus Corporation maintains the file of the original applications. Each EPA Regional office maintains a file of copies of the original applications for that region.

RRP firms: As of October, 2009 firms apply for certification through EPA. However, as States become authorized to administer their own RRP programs, States will be responsible for the authorization of firms in their state. EPA will collect data on the numbers of firms certified in each authorized state as part of the Agency's oversight of authorized programs through semi-annual reports from grantees.

Methods and Assumptions:
Processing abatement applications- Each complete application for certification or accreditation in Federally-managed states and tribal lands is processed (approximately 3000 per year). Certification is issued if all criteria are met. Some applications may be returned to the applicant or withdrawn by the applicant. For the applications that are fully processed, the length of time for EPA processing can be determined from date fields in the FLPP database. Accordingly, a census of all the fully processed applications for certification is periodically conducted, and the percentage of applications that took more than the prescribed number of days (e.g., 20) of EPA effort to process is computed based on this census. The census is conducted every six months, and the annual percentage calculated appropriately from the six month percentages. The data used to estimate this performance measure directly reflect all information that has been recorded pertaining to certification applications and are the most acceptable for this requirement. The data meet the standards in the QMP and the outcomes are reviewed by senior management.

RRP firms: The above methods and assumptions apply to the lead abatement program. On March 31, 2008, EPA issued a new rule (Renovation, Repair, and Painting Program Rule or RRP rule) aimed at protecting children from lead-based paint hazards. The rule requires contractors and construction professionals that work in pre-1978 housing or child-occupied facilities to follow lead-safe work practice standards to reduce potential exposure to dangerous levels of lead for children in places they frequent. In April, 2009, training providers may begin applying to EPA for accreditation to provide renovator or dust sampling technician training. Persons seeking certification as renovators or dust sampling technicians may take accredited training as soon as it is available. In October, 2009, firms may begin applying to EPA for certification to conduct renovations. Beginning in April, 2010, renovations in target (pre-1978) housing and child-occupied facilities must be conducted by certified renovation firms, using renovators with accredited training, and following the work practice requirements of the rule.

For 2011, EPA will be reviewing and adjusting performance measures for both the abatement program and the RRP program as appropriate.

Suitability:
Processing abatement applications: This measure tracks EPA Headquarters and Regional effort in processing lead-based paint certification and refund applications for the abatement program. This measure reflects an integral part of the Lead Program and ensures proper training for lead-based professionals. Data are available mid-year and end-of-year and enable the program to demonstrate program efficiencies and enhance accountability.

RRP firms: This measure tracks total impact of the RRP regulation via establishment of a cadre of certified firms available for Remodeling work throughout the country. In October, 2009, firms may begin applying to EPA for certification to conduct renovations. Beginning in April, 2010, renovations in target (pre-1978) housing and child-occupied facilities must be conducted by certified renovation firms, using renovators with accredited training, and following the work practice requirements of the rule.

QA/QC Procedures: OPPT has in place a signed Quality Management Plan ("Quality Management Plan for the Office of Pollution Prevention and Toxics; Office of Prevention, Pesticides and Toxic Substances," November 2008). Like the 2003 QMP, it will ensure the standards and procedures are applied to this effort. In addition, NPCD has an approved Quality Management Plan in place, dated July 2008. Applications and instructions for applying for certification and accreditation are documented and available at the Web site http://www.epa.gov/lead/pubs/traincert.htm. Documentation for the FLPP database is maintained internally at EPA and is available upon request.

Data Quality Reviews: The FLPP database is an internal EPA database, maintained for the purpose of processing and tracking applications. The database is interactive, and operational usage in processing applications by Headquarters and the Regional offices provides ongoing internal quality reviews. Further, EPA periodically checks contractors' data entry quality.

Data Limitations: Processing abatement applications: Applications that were returned to the applicant or withdrawn by the applicant are not captured in the database queries and are out of scope for this performance measure. While the report is based on a census, it generates some duplicative data, which must be removed manually. Efforts are made to remove all duplicative data, while preserving valid data. However, because this is a non-automated process, a small amount of human error is possible. Some variability occurs due to unique conditions that vary by Region. Some Regions consistently process applications in less time than others. This variability may be due to factors such as badge printing capabilities and economies of scale. Efforts are currently being made to automate this report.

RRP firms: Data are estimates from firm certification applications received either directly by EPA or through EPA authorized State programs and reported to EPA Regional offices.

Error Estimate: Processing abatement applications: There is little or no sampling error in this performance measure, because it is based on a census of all applicable records.

RRP firms: Statistical approaches are generally not used across the program and therefore error estimates are not available.

New/Improved Data or Systems: The FLPP database is currently undergoing improvements to track individual certifications and training provider accreditations for the Renovation, Repair and Painting (RRP) program.

As additional states report RRP firms data to EPA Regional offices, we will consider automating this process through the addition of the Regional Annual Commitment System (ACS) measure. This may not be needed until 2012 or future years.

References: 1) Quality Management Plan for National Program Chemicals Division, June 2008; 2) FLPP database documentation; 3) URL for Applications and Instructions, http://www.epa.gov/lead/pubs/traincert.htm.

FY 2011 Performance Measures:

- **Annual reduction in the production-adjusted risk-based score of releases and transfers of Inventory Update Reporting (IUR) chemicals from manufacturing facilities (program assessment measure)**

Performance Database: The Risk Screening Environmental Indicators (RSEI) Model feeds this measures and uses annual reporting from individual industrial facilities along with a variety of other information to evaluate chemical emissions and other waste management activities. RSEI incorporates detailed data from EPA's Toxics Release Inventory (TRI) and Integrated Risk Information System, the U.S. Census, and many other sources. Due to a two year TRI data lag, most recent performance data are only available for FY 2007 and earlier. The data are based on calendar year.

Data Source: The RSEI model incorporates data on chemical emissions and transfers and facility locations from EPA's Toxics Release Inventory; chemical toxicity data from IRIS; facility location data from EPA's Facility Registry System (FRS); stack data from EPA's AIRS Facility Subsystem and National Emissions Trends Database and the Electric Power Research Institute; meteorological data from the National Climatic Data Center; stream reach data from EPA's Reach File 1 Database; stream discharge data from EPA's Permit Compliance System (PCS) and Integrated Compliance Information System (ICIS); data on drinking water systems from EPA's Safe Drinking Water Information System; fishing activity data from U.S. Fish and Wildlife; exposure factors from EPA's Exposure Factor Handbook; and population data from the U.S. Census Bureau.

Methods and Assumptions: The RSEI Model generates unique, unitless, numerical values, known as "Indicator Elements" using the factors pertaining to surrogate dose, toxicity and exposed population for each release-exposure event. Indicator Elements are risk-related measures generated for every possible combination of reporting facility, chemical, release medium, and exposure pathway (inhalation or ingestion). Together these values form the building blocks to describe exposure scenarios of interest. Indicator Elements are like index numbers that can be compared to one-another but do not reflect *actual* risk, and are proportional to the modeled relative risk of each release (incrementally higher numbers reflect greater estimated risk). These Indicator Elements are summed in various ways to represent the risk-related results for releases users are interested in assessing. RSEI results are for comparative purposes and are only meaningful when compared to other scores produced by RSEI. These data are acceptable

for use in performance measurement as they are national data reflecting releases and transfers of chemicals from manufacturing facilities.

The Toxics Release Inventory covers multiple industries including manufacturing, metal and coal mining, electric utilities and commercial hazardous waste treatment. The measure only looks at releases from the manufacturing sector to most closely represent the sector over which IUR-related efforts will be effective. Currently, there are close to 650 chemicals found in the TRI, however, only about a third of those (approximately 237) are IUR chemicals of concern in RSEI. In order to generate a RSEI score the chemicals need toxicity data. Therefore, of the approximate 237 TRI chemicals in RESI, some were excluded that did not have toxicity weights, reducing the number of chemicals included in the measure to just below 200.

Suitability: This RESI measure supports the long term goal to reduce the RSEI index for IUR chemicals of concern 45% by 2011. This measure provides a suitable year to year comparison against this goal and looks specifically at the reduction of risk for the subset of TRI chemicals that are also IUR chemicals. The year to year comparison can reveal trends in the risk from IUR chemicals over time. Despite a two year lag in TRI data, annual comparisons of RSEI IUR results can reveal trends in chemical risk over time. Further, depending on how the user wishes to aggregate data, RSEI can also address trends nationally, regionally, by state or smaller geographic areas.

QA/QC Procedures: OPPT has in place a signed Quality Management Plan ("Quality Management Plan for the Office of Pollution Prevention and Toxics; Office of Prevention, Pesticides and Toxic Substances," November 2008) and a specific Plan for the model ("Quality Assurance Project Plan Risk Screening Environmental Indicators Model Version 2.1.6", which applies to the 2.2.0 version of RSEI) will ensure that those standards and procedures are applied to this effort. The 2008 QMP will assure that those standards and procedures are applied to this effort. Additionally, because TRI facilities self-report release data and occasionally make errors TRI has quality control functions and an error-correction mechanism for reporting such mistakes. Finally during each RSEI update, the output data are checked against TRI data for consistency, and the results are compared against previous years' RSEI results.

Data Quality Reviews: RSEI depends upon a broad array of data resources, each of which has completed a data-specific quality review process managed by the providers of the data sources. RSEI includes data from the many sources listed in "Data Sources", above. All data are collected for regulatory or programmatic purposes and are of sufficient quality to be used by EPA, other Federal agencies, and state regulatory agencies. Over the course of its development, RSEI has been the subject of three reviews by EPA's Science Advisory Board (SAB). The RSEI model has undergone continuous upgrading since the 1997 SAB Review. Toxicity weighting methodology was completely revised and subject to a second positive review by SAB (in collaboration with EPA's Civil Rights program); air methodology was revised and groundtruthed using New York data to demonstrate high confidence; water methodology has been revised in collaboration with EPA's Water program. When the land methodology has been reviewed

and revised, EPA will have completed its formal, written response to the 1997 SAB Review.

Data Limitations: RSEI relies on facility-specific data (for parameters such as stack height, discharge stream reach, location) from EPA data sources. Where such data are not available, default assumptions are used, or in some cases, the release is not modeled. Offsite releases (from transfers of toxic chemicals) are particularly affected by a lack of reported TRI data, and while RSEI addresses this through a process that optimizes the available data, the data are limited and of uneven quality. In addition, toxicity data are not available for some of the less-toxic TRI chemicals. Releases to water are not available for Alaska, Hawaii, Puerto Rico and U.S. territories, and some releases to water (for reporting facilities and offsite facilities) may not be modeled because of inadequate coverage in the stream reach data. It should also be noted that TRI data include releases only from TRI-reportable facilities for TRI-reportable chemicals. It does not include all releases from reporting facilities or all releases of TRI-reportable chemicals. TRI data may also have errors that are not corrected in the standard TRI QC process.

Error Estimate: In developing the RSEI methodology, both sensitivity analyses and groundtruthing studies have been used to address model accuracy (www.epa.gov/oppt/rsei/). For example, groundtruthing of the air modeling performed by RSEI compared to site-specific regulatory modeling done by the state of New York showed virtually identical results in both rank order and magnitude. However, the complexity of modeling performed in RSEI, coupled with un-quantified data limitations, limits a precise estimation of errors that may either over- or under-estimate risk-related results.

New/Improved Data or Systems: The program regularly tracks improvements in other Agency databases (e.g., Safe Drinking Water Information System and Reach File databases) and incorporates updated data into the RSEI databases. Such improvements can also lead to methodological modifications in the model. For the 2.2.0 update, the air dispersion model used by RSEI is being updated to the Office of Air's recommended model, AERMOD. Additionally, corrections in TRI reporting data for all previous years are captured by the annual updates to the RSEI model databases. EPA is now using data from the FRS to assign geographic locations to TRI facilities.

References: The methodologies used in RSEI were first documented for the 1997 review by the EPA Science Advisory Board. The Agency has provided this and other updated technical documentation on the RSEI Home Page.

U.S. EPA Office of Pollution Prevention and Toxics, Risk Screening Environmental Indicators Model (RSEI) Home Page. Internet: http://www.epa.gov/opptintr/rsei/
U.S. EPA Office of Pollution Prevention and Toxics, Risk Screening Environmental Indicators Model, Peer Reviews. Internet: http://www.epa.gov/oppt/rsei/pubs/faqs.html
U.S. EPA Office of Pollution Prevention and Toxics, RSEI Methodology Document. Internet: http://www.epa.gov/opptintr/rsei/pubs/method2004.pdf
U.S. EPA Office of Pollution Prevention and Toxics, RSEI User's Manual. Internet: http://www.epa.gov/opptintr/rsei/pubs/users_manual.pdf

U.S. EPA Office of Pollution Prevention and Toxics, RSEI Fact Sheet,. Internet: http://www.epa.gov/opptintr/rsei/pubs/factsheet_v2-1.pdf

FY 2011 Performance Measure:

- **Percent of new chemicals or organisms introduced into commerce that do not pose unreasonable risks to workers, consumers or environment**

Performance Database: Implementation of this measure will require the use of several EPA databases: Confidential Business Information Tracking System (CBITS), (Management Information Tracking System) MITS, (Pre-manufacture Notice) PMN Lotus Notes, (PMN) CBI Local Area Network (LAN), 8(e) database for new chemicals called ISIS, and the Focus database. The following information from these databases will be used collectively in applying this measure:
• CBITS: Tracking information on Pre-Manufacture Notices (PMNs) received;
• MITS: Captures NCP regulatory dispositions and maintains NCP workflow for new chemicals;
PMN Lotus Notes: Records PMN review and decision, assessment reports on chemicals submitted for review. New workflow system for new chemicals submitted since August 2008.
• PMN CBI LAN: Records documenting PMN review and decision, assessment reports on chemicals submitted for review before August 2008. In addition, the information developed for each PMN is kept in hard copy in the Confidential Business Information Center (CBIC);
• ISIS: Data submitted by industry under the Toxic Substances Control Act (TSCA) Section 8(e). TSCA 8(e) requires that chemical manufacturers, processors, and distributors notify EPA immediately of new (e.g. not already reported), unpublished chemical information that reasonably supports a conclusion of substantial risk. TSCA 8(e) substantial risk information notices most often contain toxicity data but may also contain information on exposure, environmental persistence, or actions being taken to reduce human health and environmental risks. It is an important information-gathering tool that serves as an early warning mechanism;
• Focus Database: Rationale for decisions emerging from Focus meeting, including decisions on whether or not to drop chemicals from further review.

Measurement results are calculated on a fiscal-year basis and draw on relevant information received over the 12-month fiscal year.

Data Source: The Office of Pollution Prevention and Toxics (OPPT) is responsible for the implementation of the TSCA. The office will compare data submitted under TSCA Section 8(e) with previously-submitted new chemical review data (submitted under TSCA Section 5 and contained in the PMN). This comparison will determine the number of instances in which EPA's current PMN review practices would have failed to prevent the introduction of new chemicals or microorganisms into commerce which pose an unreasonable risk to workers, consumers or the environment. Inconsistencies between the

8(e) and previously-submitted new chemical review data will be evaluated by applying the methods and steps outlined below to determine whether the inconsistencies signify an "unreasonable risk."

Methods and Assumptions: EPA's methods for implementing this measure involve determining whether EPA's current PMN review practices would have failed to prevent the introduction of chemicals or microorganisms into commerce that pose an unreasonable risk to workers, consumers or the environment, based on comparisons of 8(e) and previously-submitted new chemical review data. The "unreasonable risk" determination is based on consideration of (1) the magnitude of risks identified by EPA, (2) limitations on risk that result from specific safeguards applied, and (3) the benefits to industry and the public expected to be provided by the new chemical substance. In considering risk, EPA looks at anticipated environmental effects, distribution and fate of the chemical substance in the environment, patterns of use, expected degree of exposure, the use of protective equipment and engineering controls, and other factors that affect or mitigate risk. The following are the steps OPPT will follow in comparing the 8(e) data with the previously-submitted new chemical review data:

1. Match all 8(e) submissions in the 8(e) database with associated TSCA Section 5 notices. TSCA Section 5 requires manufacturers to give EPA a 90-day advance notice (via a pre-manufacture notice or PMN) of their intent to manufacture and/or import a new chemical. The PMN includes information such as specific chemistry identity, use, anticipated production volume, exposure and release information, and existing available test data. The information is reviewed through the New Chemicals Program to determine whether action is needed to prohibit or limit manufacturing, processing, or use of a chemical.
2. Characterize the resulting 8(e) submissions based on the PMN review phase. For example, were the 8(e) submissions received: a) before the PMN notice was received by EPA, b) during the PMN review process, or c) after the PMN review was completed?
3. Review of 8(e) data focusing on 8(e)s received after the PMN review period was completed.
4. Compare hazard evaluation developed during PMN review with the associated 8(e) submission.
5. Report on the accuracy of the initial hazard determination.
6. Revise risk assessment to determine if there was an unreasonable risk based on established risk assessment and risk management guidelines and whether current PMN Review practices would have detected and prevented that risk.

Suitability: The databases used and the information retrieved are directly applicable to this measurement and therefore suitable for measurement purposes. This measure supports the New Chemical program's goal to ensure that new chemicals introduced into commerce do not pose unreasonable risks to workers, consumers, or the environment. This measure provides a suitable year to year comparison against this goal because supporting data and analysis are conducted on an annual basis, directly linking to this long-term goal.

QA/QC Procedures: OPPT has in place a signed Quality Management Plan ("Quality Management Plan for the Office of Pollution Prevention and Toxics; Office of Prevention, Pesticides and Toxic Substances," November 2008. Like the 2003 QMP, it will ensure the standards and procedures are applied to this effort.

Data Quality Reviews: Information developed in the course of measurement will be presented to senior management within OPPT to address potential concerns related to technical outcomes and to provide quality oversight. In addition, the National Pollution Prevention and Toxics Advisory Council (NPPTAC), external experts who offer advice, information and recommendations to OPPT, provided comments on this measure.

Data Limitations: There are some limitations of EPA's review which result from differences in the quality and completeness of 8(e) data provided by industry; for example, OPPT cannot evaluate submissions that do not contain adequate information on chemical identity. The review is also affected in some cases by a lack of available electronic information. In particular the pre-1996 PMN cases are only retrievable in hard copy and may have to be requested from the Federal Document Storage Center. This may introduce some delays to the review process.

Error Estimate: Not applicable. This measure does not require inferences from statistical samples and therefore there is no estimate of statistical error. OPPT will review all 8(e) submissions received in the year with corresponding previously-submitted new chemical review data, and not a sample of such submissions.

New/Improved Data or Systems: OPPT is currently developing the integrated, electronic Manage Toxic Substances (MTS) system that will provide real time access to prospective PMN review.

References: OPPT New Chemicals Program
http://www.epa.gov/opptintr/newchems/, TSCA Section 8(e) – Substantial Risk
"Quality Management Plan for the Office of Pollution Prevention and Toxics; Office of Prevention, Pesticides and Toxic Substances;" June 2003.

<u>FY 2011 Performance Measures</u>:

- **Percent reduction from baseline year in cost of managing PMN submissions through the Focus meeting as a percentage of baseline year cost (program assessment efficiency measure)**

Performance Databases: EPA will rely on several principal databases to facilitate implementation of the TSCA Section 8(e) and new chemical submission efficiency measures:

- Confidential Business Information Tracking System (CBITS): CBITS allows users to access basic identifying and status information on each hard copy 8(e) notification and new chemical submission to EPA, track receipt of each hard copy

submission as well as requests for copies of submissions or information therein, and to obtain data on number of hard copy submissions and requests for copies per fiscal year. CBITS is a paper system which will eventually be phased out in favor of MTS database (see below).

- Manage Toxic Substances (MTS) database: This is a new system that, when applied to 8(e) notifications and new chemical submissions in FY 2008, will enable users to receive, process, and store electronic submissions of 8(e) notifications and new chemical submissions information, and accommodate subsequent searches and retrievals performed by EPA or contractor staff. The system will provide data on the number of electronic submissions per fiscal year and the number of searches and retrievals conducted electronically by accessing scanned documents.

Data Sources: The sources of data for this performance measure are the 8(e) notifications and new chemical submissions and the information summarized in the databases described above. No external data sources play a direct role in the calculation of measurement results, although the 8(e) notifications often make reference to external data sources in which the reported 8(e) information originally appeared.

Methods and Assumptions: The efficiency measure "Average cost of TSCA Section 8(e) processing and searches" is calculated by: (1) defining the baseline year (FY 2007) and developing baseline information expressed as the average time required to conduct 8(e) processing and searches in the baseline year; (2) converting average time to average cost measurements; (3) setting appropriate targets for outyears, reflecting increasing levels of efficiency; and (4) conducting actual measurements for fiscal years beginning with FY 2009, after electronic submissions, processing and searches begin. These steps can be summarized individually as follows:

(1) <u>Obtain baseline data:</u> FY 2008 baseline data were obtained for each of five distinct sub-measures that are combined additively to produce the single efficiency measure described here. These sub-measures and the associated average handling times for 8(e)'s are: (a) average time spent sorting mail for 8(e)'s in the Confidential Business Information Center (CBIC) – 5 minutes per 8(e); (b) average time spent processing 8(e)'s in the CBIC – 10 minutes per 8(e); (c) average time searching the CBITS and/or MTS databases – 20 minutes per 8(e); (d) average time spent retrieving 8(e)'s from the CBIC – 25 minutes per 8(e); and (e) average time spent retrieving 8(e)'s off the shelf and replacing them – 2 minutes per 8(e). Collectively, these sub-measures represent the complete activity profile for 8(e) processing and searches. The time estimates are based on interviews with key staff conducted by the program.

(2) <u>Convert average time baseline to average cost</u>: For sub-measures that describe tasks performed by EPA staff, average time estimates have been converted to average cost by taking the standard hourly rate for a biologist at grade 14, step 1; dividing by 60 to express the hourly rate in minutes; and multiplying the result by the average time estimate (in minutes), yielding the average cost per 8(e). Similar calculations are performed for sub-measures that

describe contractor tasks, except that the hourly rate is obtained from actual experience under the applicable contract.

(3) Set targets for fiscal years: The gradual expansion of electronic reporting and scanning is the main factor driving the targeted improvement in the measure. Target setting is based on what is considered reasonable and achievable. Targets are expressed, preliminarily, as the expected percentage increase in electronic submissions or scanned 8(e)s from the baseline fiscal year and the amount of time required for handling of such materials.

(4) Conduct measurements: The final step in the measurement process is to perform the actual measurements for specific fiscal years. This is done by consulting the databases described earlier to determine the actual proportion of submissions and searches/retrievals that are electronic and the proportion that are non-electronic, and inserting these data into the appropriate average cost formula. For instance, with respect to the average sorting time measure, one substitutes the actual proportion of non-electronic submissions for the target of .95 and the actual proportion of electronic submissions for the target of .05, leaving all other numbers in the formula the same.

There are a number of facts and assumptions underlying the preceding methodology: (a) Baseline 8(e) submissions and searches are all conducted non-electronically; (b) The overall number of submissions and search requests will remain static over the three-year period; (c) Possible increases in contractor and EPA staff costs are disregarded; and (d) for the average time searching CBITS/MTS sub-measure, the cost of electronic searches is proportional to search time (i.e., 20 minutes / 5 minutes = baseline cost divided by 4 = $12.40/4 = $3.10). For the other sub-measures, the average time and average cost are zero. Note: Item (a) can be considered a fact, while items (b)-(d) are assumptions.

The calculation is the nearly the same for new chemical submissions. Just substitute "new chemical submissions" for "8(e)" above. The sub-measures and the associated average handling times for new chemical submissions are slightly modified. They are: (a) average time spent sorting and processing mail for new chemical submissions in the Confidential Business Information Center (CBIC) – 35 minutes per new chemical submission; and (b) average time searching and retrieving new chemical submissions – 45 minutes per new chemical submission. Collectively, these sub-measures represent the complete activity profile for new chemical submission processing and searches. The time estimates are based on interviews with key staff conducted by the program.

The performance measures are suitable efficiency measures because average cost takes into account all expenses involved. The sub-measures exhaust all activities which contribute to process and the associated costs. The data collected and analyzed represent the costs of 8(e) and new chemical processing and are the most acceptable data available for this measure. All data meet the QMP requirements and outcomes are reviewed by OPPT senior management.

Suitability: The indicators selected are suitable and appropriate because they reflect expected cost savings stemming from automation of the new chemical submission and

8(e) notification and review process. This represents EPA's progress toward its goal of improving program efficiency.

QA/QC Procedures: OPPT has in place a signed Quality Management Plan ("Quality Management Plan for the Office of Pollution Prevention and Toxics; Office of Prevention, Pesticides and Toxic Substances," November 2008. Like the 2003 QMP, it will ensure the standards and procedures are applied to this effort.

Data Quality Review: Information developed in the course of measurement will be presented to senior management within OPPT to address potential concerns related to technical outcomes and to provide quality oversight.

Data Limitations: No specific data limitations have been identified with respect to the information relied upon in developing or reporting these measures.

Error Estimate: Not applicable. The measures do not require inferences from statistical samples and therefore there is no estimate of statistical error.

New/Improved Data or Systems: As mentioned above, the development and deployment of the new MITS (Manage Toxic Substances) database will enable users to track electronic submissions and handling of 8(e) and new chemical information. The system will provide data on the number of electronic submissions per fiscal year and the number of searches and retrievals conducted electronically by accessing scanned documents.

References: http://www.epa.gov/opptintr/tsca8e/

FY 2011 Performance Measure:

- **Conduct 400 Risk Management Plan audits and inspections**

Performance Database: The EPA Annual Commitment System (ACS) is the database for the number of risk management plan (RMP) audits.

Data Source: OSWER's Office of Emergency Management implements the Risk Management Program under Clean Air Act section 112(r). Facilities are required to prepare Risk Management Plans (RMPs) and submit them to EPA. In turn, EPA Headquarters (HQ) provides appropriate data to each Region and delegated State so that they have the RMP data for their geographical area. The Regions and delegated States conduct audits. About ten States have received delegation to operate the RMP program. These delegated States report audit numbers to the appropriate EPA Regional office so it can maintain composite information on RMP audits.

Methods and Assumptions: Regions enter data into the Agency's Annual Commitment System. HQ prepares an annual report. Data are count data and not open to interpretation.

Suitability: The subobjective's goal is to reduce chemical risks at facilities and in communities. Under the authority of section 112(r) of the Clean Air Act, the Chemical Accident Prevention Provisions require facilities that produce, handle, process, distribute, or store certain chemicals to develop a Risk Management Program, prepare a Risk Management Plan (RMP), and submit the RMP to EPA The purpose of this performance measure is to ensure that facilities that are required to have risk management plans do indeed have plans and are available in case of an incident.

QA/QC Procedures: Data are collected from states by EPA's Regional offices, and reviewed at the time of Regional data entry. Data are regularly compared to similar data from the past to identify potential errors.

Data Quality Review: Data quality is evaluated by both Regional and Headquarters' personnel.

Data Limitations: Data quality is dependent on completeness and accuracy of the data provided by state programs and the EPA Regional offices.

Error Estimate: Not calculated.

New/Improved Data or Systems: N/A

Reference: N/A

FY 2011 Performance Measure:

- **Number of countries completing phase out of leaded gasoline**
- **Number of countries introducing low sulfur in fuels**

Performance Database: UNEP Partnership Clearinghouse; This performance measure tracks the number of countries that have phased out lead in gasoline. EPA works with the United Nations Environment Programme (UNEP) and other partners in the global Partnership for Clean Fuels and Vehicles to document the phase out of leaded gasoline and the reduction of sulfur levels in fuels worldwide. UNEP manages the Partnership Clearinghouse, which tracks the status of lead phase-out efforts and the status of sulfur reduction efforts in each country. The Partnership Clearinghouse also documents and verifies each country's implementation of lead phase out and sulfur reduction programs. The Partnership's data on lead phase-out can be found on the Partnership website at: http://www.unep.org/PCFV/Data/data.htm#leaded. The Partnership's data on sulfur levels in fuels, by country, can be found on the Partnership website at: http://www.unep.org/PCFV/Data/data.htm#sulphur

Data Source: The United Nations Environment Programme serves as the Clearinghouse for the Partnership for Clean Fuels and Vehicles and maintains a database of the status of country lead-phase out. Information from the database is posted on the Partnership

website and updated periodically by UNEP -- at least every 6 months. UNEP collects the data from public and private sector partners and contacts government and industry experts in each country for verification before the data are posted. This data collection and cross-checking provide the best currently available information on country lead phase-out status and levels of sulfur.

Methods, Assumptions and Suitability: There currently is no available database on international leaded gasoline sales data or market penetration of alternative fuels, nor is there any international database on sulfur levels in fuels. Because of this gap, the Partnership made the decision to track the number of countries that have phased out lead and reduced sulfur because the data are more easily verifiable. The Partnership has recently added the capacity to provide summary date from a commercially available fuel quality database to verify lead and sulfur levels in fuels. The database has limited country coverage. The samples are taken using internationally-acceptable quality control and assurance procedures. The data will be used to verify the PCFV database.

QA/QC Procedures: Experts at the Partnership for Clean Fuels and Vehicles verify the information in the Partnership Clearinghouse by contacting key people from industry and government within each country. The fuel quality database used to verify lead and sulfur levels in fuels uses internationally-acceptable quality control and assurance procedures.

Data Quality Reviews: N/A

Data Limitations: There currently is no available database on leaded gasoline sales data or market penetration of alternative fuels. The Partnership made the decision to track the number of countries that have phased out lead and reduced sulfur in fuels, because the data are more easily verifiable. Fuel changes and lead phase- out are implemented in different ways in different countries, mostly by legislation. But having the legislation in place does not mean that lead has been eliminated from gasoline. Many countries have set dates for lead phase-out and sulfur reduction; however the Partnership tracks actual progress toward implementation. . The fuel quality database has limited country coverage and represents spot-sampling of fuels, not a statistically valid average of fuel quality in a country. The data will be used in conjunction with other available information to update the PCFV database and verify progress under the Partnership.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: For additional information on the Partnership for Clean Fuels and Vehicles, see the Partnership website at http://www.unep.org/PCFV

For more information concerning the database for phase-out of leaded gasoline, see

http://www.unep.org/PCFV/Data/data.htm#leaded

For additional information on sulfur levels, see
http://www.unep.org/PCFV/Data/data.htm#sulphur

GOAL 4 OBJECTIVE 2

FY 2011 Performance Measures:

- **Brownfields properties assessed (program assessment measure)**
- **Number of properties cleaned up using Brownfields funding**
- **Jobs leveraged from Brownfields activities**
- **Billions of dollars of cleanup and redevelopment funds leveraged at Brownfields properties. (program assessment measure)**
- **Acres of Brownfields made ready for reuse (program assessment measure)**
- **Acres of Brownfields made ready for reuse per million dollars (program assessment efficiency measure)**

Performance Database: The Assessment Cleanup and Redevelopment Exchange System (ACRES) tracks the performance information for the above measures.

Key fields related to performance measures include, but are not limited to:

Property Acreage
Assessment Completion Date
Cleanup Required
Cleanup Completion Date
Institutional Controls Required
Institutional Controls in Place/Date
Engineering Controls Required
Engineering Controls in Place/date
Funding Leveraged
Jobs Leveraged

Performance measure data is tracked by fiscal year and will not be available for the FY 2010 PAR; data will be available for the FY 2011 PAR.

Data Source: Data are extracted from quarterly reports and property profile forms (http://www.epa.gov/brownfields/pubs/rptforms.htm) prepared by assessment, cleanup, revolving loan fund (RLF), job training, and State and Tribal 128 Voluntary Response Program cooperative agreement award recipients. Information on Targeted Brownfields Assessments (TBA) is collected from EPA Regions.

Methods, Assumptions and Suitability: Cooperative agreement recipients report performance data in quarterly reports and property profile forms. Data are reviewed by Regional EPA grant managers to verify activities and accomplishments. Given the

reporting cycle and the data entry/QA period, there is typically a several month data lag for ACRES data.

Note that accomplishments reported by Brownfields Assessment Grantees, Brownfields Cleanup Grantees, Brownfields RLF Grantees, Regional TBAs, and State and Tribal 128 Voluntary Response Program Grantees all contribute towards these performance measures. "Number of Brownfields properties assessed" is an aggregate of assessments completed with Assessment Grant funding, Regional TBA funding, and State and Tribal 128 Voluntary Response Program funding. “Number of Brownfields properties cleaned up” is an aggregate of properties cleaned up by RLF Grantees, Cleanup Grantees, and State and Tribal 128 Voluntary Response Program Grantees. "Number of Acres Made Ready for Reuse" is an aggregate of acreage assessed that does not require cleanup and acreage cleaned up as reported by Assessment Grantees, Regional Targeted Brownfields Assessments, Cleanup Grantees, RLF Grantees, and State and Tribal 128 Voluntary Response Program Grantees for which any required institutional controls are in place. “Number of cleanup and redevelopment jobs leveraged” is the aggregate of jobs leveraged by Assessment, Cleanup, RLF and State and Tribal 128 Voluntary Response Program Grantees. “Amount of cleanup and redevelopment funds leveraged at Brownfields properties” is the aggregate of funds leveraged by Assessment, Cleanup, RLF, and State and Tribal 128 Voluntary Response Program Grantees.

QA/QC Procedures: Data reported by cooperative award agreement recipients are reviewed by EPA Regional grant managers for accuracy and to ensure appropriate interpretation of performance measure definitions. Reports are produced monthly with detailed data trends analysis.

Data Quality Reviews: No external reviews.

Data Limitations: All data provided voluntarily by grantees.

Error Estimate: NA

New/Improved Data or Systems: The Brownfields Program has updated, launched and phased-in an online reporting form in FY 2009 to improve data collection and to expand the community of grantees completing the form.

References: U.S. Environmental Protection Agency, “Investing in Partnership, Possibility and People: A Report to Stakeholders from the US EPA Brownfields Program”, Office of Brownfields and Land Revitalization, November 2005, http://www.epa.gov/brownfields/news/stake_report.htm (accessed August 15, 2009).

U.S. Environmental Protection Agency, “Brownfields Assessment Pilots/Grants”, Office of Brownfields and Land Revitalization, http://www.epa.gov/brownfields/assessment_grants.htm (accessed August 15, 2009).

U.S. Environmental Protection Agency, "Brownfields Cleanup Revolving Loan Fund Pilots/Grants", Office of Brownfields and Land Revitalization, http://www.epa.gov/brownfields/rlflst.htm (accessed August 15, 2009).

U.S. Environmental Protection Agency, "Brownfields Job Training Pilots/Grants", Office of Brownfields and Land Revitalization, http://www.epa.gov/brownfields/job.htm (accessed August 15, 2009).

U.S. Environmental Protection Agency, "Brownfields Cleanup Grants", Office of Brownfields and Land Revitalization, http://www.epa.gov/brownfields/cleanup_grants.htm (accessed August 15, 2009).

FY 2011 Performance Measures:

- **Number of additional homes provided safe drinking water in the Mexican border area that lacked access to drinking water in 2003 (program assessment annual measure)**
- **Number of additional homes provided adequate wastewater sanitation in the Mexican border area that lacked access to wastewater sanitation in 2003 (program assessment annual measure)**
- **Loading of Biochemical Oxygen Demand removed (million pounds/year) from the US-Mexico border area since 2003**
- **Additional people served per million dollars (US and Mexico federal expenditures) (program assessment efficiency measure)**
    - **The program is currently reviewing alternative efficiency measures.**

Performance Database: No formal EPA database. Performance is tracked and reported quarterly by the Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADBank). Data fields are population served by and homes connected to potable water and wastewater collection and treatment systems resulting from the completion of certified projects.

Data Source: Data sources to establish the baseline include U.S. population figures from the 2000 U.S. Census and Mexican population figures from CONAGUA. Data on population served and homes connected by "certified" water/wastewater projects are estimated and reported by BECC and NADBank and reflected in EPA project completion schedules for certified projects.

Methods, Assumptions and Suitability: Summation of population served and homes connected by "certified" water/wastewater projects from BECC and NADBank as reflected in EPA project completion schedules.

QA/QC Procedures: EPA Headquarters is responsible for evaluation of reports from BECC and NADBank on drinking water and wastewater sanitation projects. Regional representatives attend meetings of the certifying and financing entities for border projects

(BECC and NADBank) and conduct site visits of projects underway to ensure the accuracy of information reported.

Data Quality Reviews: Regional representatives attend meetings of the certifying and financing entities for border projects (BECC and NADBank) and conduct site visits of projects underway to ensure the accuracy of information reported.

Data Limitations: None.

Error Estimate: The error estimate is the same rate accepted by the U.S. Census.

New/Improved Data or Systems: None.

References:

U.S. Department of Commerce, Bureau of the Census, (Washington, DC: U.S. Department of Commerce, 1990). *Instituto Nacional de Estadistica, Geografia y Informatica, Aguascalientes*, Total Population by State (1990).

Border Environment Cooperation Commission (BECC), Cd Juarez, Chih, and North American Development Bank (NADBank), (San Antonio, TX, 2002).

GOAL 4 OBJECTIVE 3

FY 2011 Performance Measures:

- **Acres of habitat protected or restored in National Estuary Program (NEP) study areas (program assessment measure)**
- **Program dollars per acre of habitat protected or restored (program assessment efficiency measure)**
- **Number of acres restored and improved under the 5-star, NEP, 319 and great waterbody programs (cumulative)**

Performance Database: The Office of Wetlands Oceans and Watersheds has developed a standardized format for data reporting and compilation, defining habitat protection and restoration activities and specifying habitat categories. The key field used to calculate annual performance is habitat acreage. Annual results have been reported since 2000 for the NEP (results are calculated on a fiscal year basis).

Information regarding habitat protection is accessible on a web page that highlights habitat loss/alteration, as well as the number of acres protected and restored by habitat type http://www.epa.gov/owow/estuaries/pivot/overview/intro.htm. This allows EPA to provide a visual means of communicating NEP performance and habitat protection and restoration progress to a wide range of stakeholders and decision-makers.

Data Source: NEP documents such as annual work plans, which report on NEP achievements during the previous year, annual progress and State of the Bay reports, and

implementation tracking materials are used to document the number of acres of habitat restored and protected. Each year, the NEPs and Regions validate the data. Then the NEPs input them into a database NEPORT which is managed by EPA. EPA annually aggregates the data provided by each NEP to arrive at a national total for the entire Program. EPA is confident that the annually-reported data are as accurate as possible. In addition, every three years EPA conducts a program evaluation of each NEPs progress implementing its management plan; the teams conducting those evaluations review the three-year habitat data as part of the comprehensive evaluation process.

Methods, Assumptions and Suitability:
The term "restored and protected" is a general term that describes a range of activities and is interpreted broadly to include: creation of habitat, acquisition of sites for the purpose of protection, conservation easements and deed restrictions, increasing submerged aquatic vegetation coverage, increasing the number of permanent shellfish bed openings, and increasing the amount of anadromous fish habitat. There is not necessarily a direct correlation between the number of habitat acres restored and protected and ecosystem health, nor is habitat quantity or quality the only indicator of ecosystem health. But, habitat acreage is an important measure of on-the-ground progress made toward meeting the EPA annual goal of protecting and restoring habitat in NEP study areas. EPA has defined and provided examples of protection and restoration activities for purposes of tracking and reporting measures (see citation for the PIVOT website in references below.)

The NEP "Habitat Acres Protected or Restored" efficiency measure is calculated by dividing the total ocean and coastal protection program dollars by the total NEP acres protected or restored. The measure is based on habitat data collected by the NEPs as described above and reported in the annual habitat measure, and the total amount of program dollars. That amount is: (1) the sum of the NEP/Coastal budget (including the additional funds for Long Island Sound and Puget Sound (2) the Marine Pollution budget, and (3) the program match as reported by the NEPs.

QA/QC Procedures: Primary data are prepared by the staff of the NEP based on their own reports and from data supplied by other partner agencies/organizations that directly engage in habitat protection and restoration. EPA requests that the NEPs follow EPA guidance to prepare their reports. The EPA Regions and Headquarters then confirms the individual NEP and national totals. EPA actions are consistent with data quality and management policies.

Data Quality Review: No audits or quality reviews have been conducted.

Data Limitations: Current data limitations include: (1) information that may be reported inconsistently across the NEPs because they may interpret the meaning of "protection and restoration" differently; (2) acreage amounts may be miscalculated or incorrectly reported, and (3) acreage may be double-counted i.e., the same parcel may also be counted more than one partner, or the same parcel may be counted more than once because it has been restored several times over a period of years. Also habitat restored

and protected may not directly correlate to overall improvements in the health of that habitat (particularly in the year of reporting); rather, habitat acreage protected and restored is only one indicator of habitat health and of on-the-ground progress made by the NEPs.

Error Estimate: No error estimate is available for this data.

New/Improved Data or Systems: EPA developed an on-line reporting system--NEPORT—that makes it possible for NEPs and EPA to track habitat projects. Also, NEPs provide latitude and longitude data (where possible) for each protection and restoration project. These data are then mapped to highlight where projects are located in each NEP study area. Not only does this help each NEP and EPA precisely identify project sites, but it also makes it possible for NEPs and EPA to validate NEPORT data, and highlights where different partners may be double counting acreage.

References: Aggregate national and regional data for this measurement, as well as data submitted by each NEP, is displayed numerically, graphically, and by habitat type in the Performance Indicators Visualization and Outreach Tool (PIVOT). PIVOT data are publicly available at http://www.epa.gov/owow/estuaries/pivot/overview/intro.htm. The Office of Water Quality Management Plan (July 2002) is available on the Intranet at http://intranet.epa.gov/ow/informationresources/quality/qualitymanage.html

FY 2011 Performance Measure:

- **Percent of goal achieved in restoring, protecting or enhancing 240 acres of coastal habitat from the 2008 baseline of 1,199 acres [Long Island Sound]**

Performance Database: The Office of Wetlands Oceans and Watersheds (OWOW) has developed a standardized format for data reporting and compilation, defining habitat protection and restoration activities and specifying habitat categories. The key field used to calculate annual performance is habitat acreage. Annual results have been reported since 2000 for the National Estuary Program (NEP) (results are calculated on a fiscal year basis). The EPA Long Island Sound Office (LISO) requires the states of New York and Connecticut, which are Long Island Sound Study Management Conference partners, to collect and report acres of habitat restored and protected as required by the NEP. The states use internal project tracking systems to gather, summarize and report restoration and protection data to LISO, which, in turn, enters the data into the OWOW habitat information system.

Data Source: NEP documents such as annual work plans (which contain achievements made in the previous year), annual progress reports and other implementation tracking materials, are used to document the number of acres of habitat restored and protected. EPA is confident that the data presented are as accurate as possible. The EPA Long Island Sound Office (LISO) reviews the information prior to reporting. In addition, EPA LISO conducts regular reviews of state habitat restoration work to help ensure that

information provided in these documents is accurate, and progress reported is in fact being achieved.

Methods, Assumptions and Suitability: Measuring the number of acres of habitat restored and protected may not directly correlate to improvements in the health of the habitat reported or of the estuary overall, but it is a suitable measure of on-the-ground progress. Habitat acreage does not necessarily correspond one-to-one with habitat quality, nor does habitat (quantity or quality) represent the only indicator of ecosystem health. Nevertheless, habitat acreage serves as an important surrogate and a measure of on-the-ground progress made toward EPA's annual performance goal of habitat protection and restoration for LIS. EPA has defined and provided examples of protection and restoration activities for purposes of measure tracking and reporting (see citation for the PIVOT website in references below.) "Restored and protected" is a general term used to describe a range of activities. The term is interpreted broadly to include created areas, protected areas resulting from acquisition, conservation easement or deed restriction, submerged aquatic vegetation coverage increases, permanent shellfish bed openings, and anadromous fish habitat increases.

QA/QC Procedures: Primary data are prepared by the state and federal staff of the LISS Habitat Restoration Team based on their own reports and from data supplied by other partnering agencies/organizations (that are responsible for implementing the action resulting in habitat protection and restoration). The LISS staff are requested to follow EPA guidance to prepare their reports, and to verify the numbers. EPA actions are consistent with data quality and management policies.

Data Quality Review: No audits or quality reviews have been conducted yet.

Data Limitations: Current data limitations include: information that may be reported inconsistently (based on different interpretations of the protection and restoration definitions), acreage that may be miscalculated or misreported, and acreage that may be double counted (same parcel may also be counted by partnering/implementing agency or need to be replanted multiple years). In addition, measuring the number of acres of habitat restored and protected may not directly correlate to improvements in the health of the habitat reported (particularly in the year of reporting), but is rather a measure of on-the-ground progress made by the NEPs.

Error Estimate: No error estimate is available for this data.

New/Improved Data or Systems: The LISS has developed a new data system to report and track habitat restoration data from the LISS. This database is publicly available on the LISS website at http://www.longislandsoundstudy.net/habitarestoration/projects/Search.aspx. The database provides information about completed and potential habitat restoration projects: Site Name, Project Title, Town, Project Description, Water Body, Habitat Type, Targeted Fish Species, Cause of Degradation, HRI Goal, Restoration Technique, Acres, Miles, Map Images, Other Embedded Documents, Project Status , Funding Sources, Project

Partners, Project Completed, Completion Date. The site locations are also mapped to highlight where these projects are located in the LISS study area.

An on-line reporting system—NEPORT-- has been developed for the NEPs' use that assists in tracking habitat projects. EPA has taken steps to align NEPORT data fields with those of the National Estuarine Restoration Inventory (NERI) and with the EPA's wetlands net gain goal.

References: See V&V for National Estuary Program for PIVOT and NEPORT.

Results of Long Island Sound habitat restoration efforts are documented in the biennial reports, *Sound Health*, and *Protection and Progress*, and the annual LISS Comprehensive Conservation and Management Plan Implementation Tracking Report, available at: http://www.longislandsoundstudy.net/publications.htm#reports. The database of habitat restoration projects is publicly available on the LISS website at http://www.longislandsoundstudy.net/habiatrestoration/projects/Search.aspx

FY 2011 Performance Measure:

- **Percent of goal achieved in reducing trade-equalized (TE) point source nitrogen discharges to Long Island Sound from the 1999 baseline of 59,146 TE lbs/day.**

Performance Database: The Permit Compliance System, (PCS) tracks permit compliance and enforcement data for sources permitted under the Clean Water Act National Pollutant Discharge Elimination System (NPDES). Data in PCS include: major permittee self-reported data contained in Discharge Monitoring Reports (DMR); data on permittee compliance status; data on state and EPA inspection and enforcement response. The states of Connecticut and New York are required, as part of their delegated NPDES permit programs, to periodically monitor and test effluent for appropriate pollutants, including nitrogen, complete DMRs and enter this information into PCS.

Data Source: Permittee self-reported DMR data are entered into PCS by state offices, which are delegated to implement the NPDES program. PCS automatically compares the entered DMR data with the pollutant limit parameters specified in the facility NPDES permit. This automated process identifies those facilities which have emitted effluent in excess of permitted levels. Facilities are designated as being in Significant Noncompliance (SNC) when reported effluent exceedances are 20% or more above permitted levels for toxic pollutants and/or 40% or more above permitted levels of conventional pollutants. PCS contains additional data obtained through reports and on-site inspections, which are used to determine SNC, including: non-effluent limit violations such as unauthorized bypasses; unpermitted discharges; and pass through of pollutants which cause water quality or health problems; permit schedule violations; non-submission of DMRs; submission of DMRs 30 or more days late; and violation of state or federal enforcement orders.

Methods, Assumptions and Suitability: There are established computer algorithms to compare DMR effluent data against permitted effluent levels. The algorithms also calculate the degree of permitted effluent exceedance to determine whether toxic/conventional pollutant SNC thresholds have been reached. Nitrogen waste load allocations (WLA) are specified in the December 2000 *A Total Maximum Daily Load (TMDL) Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound* that was prepared by the states of New York and Connecticut and approved by EPA in conformance with Section 303(d) of the Clean Water Act. The TMDL nitrogen WLAs are included in the NPDES (state-delegated) permits issued by the states for dischargers to Long Island Sound.

QA/QC Procedures: State offices have documentation of the design, construction and maintenance of the databases used for the performance measures, showing they conform to EPA's PCS standards for point source data. Quality Assurance/Quality Control procedures are in place for PCS data entry. State and Regional PCS data entry staff are required to take PCS training courses. Quality Management Plans (QMPs) are prepared for each Office within The Office of Enforcement and Compliance Assurance (OECA). The Office of Compliance (OC) has established extensive processes for ensuring timely input, review and certification of PCS information.

Data Quality Review: Information contained in PCS is required by policy to be reviewed by regional and headquarters= staff for completeness and accuracy. SNC data in PCS are reviewed quarterly.

Data Limitations: Legal requirements for permittees to self-report data on compliance with effluent parameters in permits generally results in consistent data quality and accuracy. EPA monitors and measures the timeliness of DMR submissions and data entry quality. National trends over the past several years show an average of 94% of DMRs is entered timely and complete. Where data entry problems are observed, OECA works directly with regions and states to improve performance, and in limited circumstances has dedicated supplemental grant resources to help regions and states correct problems.

Error Estimate: There may be errors of omission, in classification, documentation or mistakes in the processing of data.

New & Improved Data or Systems: PCS was developed during the 1980's and has undergone periodic revision and upgrade since then. OECA is currently developing a modernized data system to replace PCS, utilizing modern data entry, storage, and analytical approaches. The replacement of PCS with ICIS-NPDES (Integrated Compliance Information System – NPDES), a modernized and user-friendly NPDES data system, began in June 2006 when eleven states began using the system; seven other states will be migrated to the new system in August. During phased implementation of ICIS-NPDES across the states a combination of PCS and ICIS-NPDES will be used to generate

SNC data. Once fully implemented, ICIS-NPDES will be the sole source of NPDES SNC data.

References: Nitrogen TMDL:
http://www.ct.gov/dep/cwp/view.asp?a=2719&q=325604&depNav_GID=1654
http://www.longislandsoundstudy.net/publications.htm#reports
PCS information is publicly available at:
http://www.epa.gov/compliance/planning/data/water/pcssys.htm

FY 2011 Performance Measure:

- **Percent of goal achieved in reopening 50 river and stream miles to diadromous fish passage from the 2008 baseline of 124 miles [Long Island Sound]**

Performance Database: The LISS has developed a new data system to report and track habitat restoration data from the LISS. The database is publically available on the LISS website at http://www.longislandsoundstudy.net/habiatrestoration/projects/Search.aspx. The database provides information about completed and potential habitat restoration projects: Site Name, Project Title, town, Project Description, Water Body, Habitat Type, Targeted Fish Species, Cause of Degradation, HRI Goal, Restoration Technique, Acres, Miles, Map Images, Other Embedded Documents, Project Status, Funding Sources, Project Partners, Project Completed, Completion Date. The site locations are also mapped to highlight where these projects are located in the LISS study area.

Currently, the Connecticut Department of Environmental Protection and the New York State Department of Environmental Conservation track and report fish passage projects and the additional miles of river and stream corridors reopened as a result. The states submit these data to the EPA Long Island Sound Office.

Data Source: The Long Island Sound Study has established a Habitat Restoration Team (HRT) comprised of federal, state, and local agency staff and private organizations. Public/Private projects to reopen river and stream corridors to fish passage are tracked by the work group coordinators (staff in the states of Connecticut and New York). In addition, the EPA Long Island Sound Office conducts regular reviews of state habitat restoration work to help ensure that information provided in these documents is accurate, and progress reported is in fact being achieved. Long Island Sound Study Habitat Restoration annual reports on projects are made available at http://www.longislandsoundstudy.net/habitat/index.htm

Methods, Assumptions, and Suitability: The Long Island Sound Study goal is to reopen additional miles of riverine migratory corridor. For each project, the location (state, town), stream name, cause of degradation, project description, miles restored,

targeted fish species, implementation partners, and project funding are tracked. Miles restored are calculated based on the length of stream that is reopened to fish by eliminating the obstacle. Each fish passage project is field verified.

QA/QC Procedures: Stream miles are considered reopened after fish are observed passing through the obstacle.

Data Quality Review: Each project report is reviewed by the habitat restoration coordinators, Habitat Restoration Team, and the EPA Long Island Sound Office.

Data Limitations: The stream corridor is considered reopened when anadromous fish are observed passing through the obstacle. The data do not assess the success rate of fish passage or the use of the upstream habitat.

Error Estimate: No error estimate is available for this data.

New/Improved Data Systems: As discussed in the performance database section, the LISS has developed a new data system to report and track habitat restoration data from the LISS. The database is publically available on the LISS website at http://www.longislandsoundstudy.net/habitatrestoration/projects/Search.aspx
The database provides information about completed and potential habitat restoration projects: Site Name, Project Title, Town, Project Description, Water Body, Habitat Type, Targeted Fish Species, Cause of Degradation, HRI Goal, Restoration Technique Acres, Miles, Map Images, Other Embedded Documents, Project Status, Funding Sources, Project Partners, Project Completed Date. The site locations are also mapped to highlight where these projects are located in the LISS study area.

References: Long Island Sound Study, Sound Health 2008 Environmental Indicators: www.longislandsoundstudy.net/indicators/index.htm on Habitat Protection/River Miles Restored and Coastal Habitat Restored. Stamford, CT: EPA Long Island Sound Office.

FY 2011 Performance Measure:

- **In partnership with the Corps of Engineers, states and tribes, achieve no net loss of wetlands each year under the Clean Water Act Section 404 regulatory program**

Performance Database: Since 1989, the goal of the Clean Water Act Section 404 program has been no net loss of wetlands.

Historically, the Corps collected limited data on wetlands losses and gains in its Regulatory Analysis and Management System (RAMS) permit tracking database. RAMS was designed to be an administrative aid in tracking permits, this it lacked many of the fields necessary to adequately track important information regarding wetland losses and gains. Also, the database was modified differently for each of the 38 Corps Districts

making national summaries difficult. Furthermore, the database was also proprietary making it difficult to retrofit without utilizing its original developers. These and other limitations in methods used for data collection, reporting and analysis resulted in difficulties in drawing reliable conclusions regarding the effects of the Section 404 program. To improve tracking of wetland gains and losses in the Section 404 permit program, in 2007 with support from EPA, the Corps deployed a new standardized nationwide permit tracking system known as ORM2 (Operation and maintenance business information link, Regulatory Module)

Data Source: ORM2 is the data source for this performance measure. Data input is conducted by Corps Regulatory Program staff.

Methods, Assumptions and Suitability: ORM2 is the definitive source of data regarding wetland and other aquatic resource impacts authorized pursuant to the Section 404 permit program. ORM2 was designed to provide improved tracking regarding:

- Type, quantity and location of aquatic resources impacted
- Type, quantity and location of aquatic resource mitigation
- Type and quantity of mitigation by method (i.e., restoration, creation, enhancement, or preservation)
- Type and quantity of mitigation by mechanism (i.e., mitigation bank, in-lieu fee mitigation, or permittee-responsible mitigation)
- Differentiating stream mitigation (in linear feet) from wetlands mitigation (in acres)
- Spatial tracking via GIS enhancements for both impact and mitigation sites (*planned)*
- Functional losses (debits) at the impact site and functional gains at the mitigation site (credits) if assessment tool is available and applied
- Mitigation banks via the inclusion of a comprehensive module for tracking and managing mitigation banks known as the Regional Internet-based Bank Information Tracking System (RIBITS). With EPA's assistance RIBITS has been deployed in approximately 18 Corps Districts.

QA/QC Procedures: After the close of the fiscal year, the Corps begins compiling national impact and mitigation data. As part of the compilation process the Corps carries out a detailed review of the data. Any data anomalies are investigated with the subject Corps District Office responsible for the source data. Following this review and vetting process, national summaries of impact and mitigation data are shared with EPA.

Data Quality Reviews: Independent evaluations published in 2001 by the National Academy of Sciences (NAS) and the General Accounting Office (GAO) provided a critical evaluation of the effectiveness of wetlands compensatory mitigation (the restoration, creation, or enhancement of wetlands to compensate for permitted wetland losses) for authorized losses of wetlands and other waters under Section 404 of the Clean Water Act. The NAS determined that available data was insufficient to determine

whether or not the Section 404 program was meeting its goal of no net loss of either wetland area or function. The NAS added that available data suggested that the program was not meeting its no net loss goal. Among its suite of recommendations, the NAS noted that wetland area and function lost and regained over time should be tracked in a national database and that the Corps should expand and improve quality assurance measures for data entry. These critical reviews helped create the impetus of the development of ORM2.

Data Limitations: FY 08 was the first full year in which the Corps' 38 District offices used ORM2 to track activities in the Section 404 Permit Program, thus there was a great deal of system debugging, training, and trouble-shooting. Also, while ORM2 has a great deal of functionality, the Corps is phasing in the requirements to utilize all of the ORM2 data entry fields. Overtime, as the system is completely debugged, users become more proficient, and data entry requirements expand, ORM2 will provide increasingly more accurate and robust data regarding wetland gains and loses in the Section 404 Permit program. In addition to these general data limitations, the Corps is currently evaluating solutions to a key mitigation data reporting challenge. Wetland Impacts are tracked in acres. Similarly all the mitigation provided by permitee-responsible mitigation and some of the mitigation provided by in lieu fee programs and mitigation banks tracks is tracked in acres. However, some mitigation banks and in-lieu fee programs may track their mitigation as "credits" which are usually based on a function or condition assessment protocol and there may not be a one to one relationship between a credit and an acre. For reporting purposes, it would be more efficient if all impacts and mitigation could be reported in acres. The Corps and EPA are exploring ways to convert these "credits" to "acres" to facilitate this reporting. However, in light of the large number of different function/condition assessment protocols used nationwide at mitigation banks and in-lieu fee programs, identifying a simple solution is proving challenging.

Error Estimate: Not applicable

References:

Information regarding ORM2 (Operation and maintenance business information link, Regulatory Molule) can be found at:
http://www.usace.army.mil/CECW/Documents/cecwo/reg/aqua/vol3-1.pdf

Regional Internet-based Bank Information Tracking System (RIBITS) website:
http://www.erdc.usace.army.mil/pls/erdcpub/WWW_WELCOME.NAVIGATION_PAGE?tmp_next_page=114145

National Academy of Sciences (2001). *Compensating for Wetland Losses Under the Clean Water Act.* Washington DC. http://www.epa.gov/wetlandsmitigation/

<u>FY 2011 Performance Measure:</u>

- **Cumulative percentage decline for the long-term trend in concentrations of PCBs in whole lake trout and walleye samples (program assessment measure)**

Performance Database: Great Lakes National Program Office (GLNPO) Great Lakes Fish Monitoring Program (GLFMP) [1](see reference #1 below). This program collects and monitors contaminants in Great Lakes fish at alternating locations throughout the Great Lakes Basin; fish are collected at one set of sites during even years and at another set in odd years. It began with the collection of data in Lake Michigan in 1972 and the additional lakes were added in 1976. In FY2011, the database will contain quality reviewed field data from fish collected in 2009 and all quality reviewed analytical data for fish collected between 1972 and 2009. Samples collected in 2009 are expected to be able to be available for reporting in 2011. Data are reported on a calendar year basis.

Data Source: GLNPO is the principal source of data for the Great Lakes Fish monitoring program. The Great Lakes States and Tribes assist with fish collection. Previous cooperating organizations include the U.S. Geological Survey (USGS), the U.S. Fish and Wildlife Service (USFWS), and the Food and Drug Administration (FDA).

Methods, Assumptions, and Suitability: This indicator provides concentrations of selected organic contaminants in Great Lakes open water fish. The Great Lakes Fish Monitoring Program monitors the potential exposure to contaminant concentrations for wildlife.

The GLFMP was created to: (1) determine time trends in contaminant concentrations, (2) assess impacts of contaminants on the fishery using fish as biomonitors, and (3) assess potential risk to the wildlife that consume contaminated fish. It includes data from ten 600-700 mm lake trout (*Salvelinus namaycush*) whole fish composites (5 fish in each composite) from each of the lakes. Since sufficient lake trout are not found in Lake Erie, data for 400 – 500 mm walleye (*Stizostedion vitreum vitreum*) are used for that Lake.

All GLFMP data are independently reviewed for quality consideration prior to loading into the Great Lakes Environmental Database (GLENDA). Included in GLENDA are flags for each data point that can be used to evaluate the quality of the data.

Each Great Lake has unique environments with distinct growth rates, food webs, and chemical integrity. For this reason, a direct comparison of annual concentrations between each lake and sub-basin is not appropriate. However, a cumulative basin-wide percent long-term trend can be determined on all years data using an exponential decrease function, starting with 1990 data as the baseline. The variability in the data caused by the intra-lake uniqueness of each lake trout (and walleye) community confounds trend analyses on shorter timeframes. All years of data from all lakes are plotted on the same graph, with each year containing 5 data points. An exponential decrease is then found for the entire data set and the long-term cumulative percent decrease is calculated using the rate constant of the best exponential fit line and the total number of years elapsed since 2000. Cumulative percent decline equals 1-e^[(-rate constant)(# of years elapsed since

2000)]. The year 2000 is selected as the baseline for this measure in the Action Plan to illustrate a more relevant measurable change on an annual basis in the long-term cumulative percent decline. The year 2000 is also more representative of the current environmental condition in the Great Lakes, but does not provide enough statistical significance to determine long-term trends from. The calculated cumulative percent decrease can then be compared to the reduction target to determine if it has been met. GLNPO rounds the calculated value to the nearest whole percentage for reporting and comparison purposes

QA/QC Procedures: GLNPO has an approved Quality Management System in place[2] (see reference #2 below) that conforms to the USEPA Quality Management Order and is audited every 3 years in accordance with Federal policy for Quality Management. The Quality Assurance (QA) plan that supports the analytical portion of the fish contaminant program is approved and available online[3] (see reference #3 below). The revised draft field sampling Quality Assurance Project Plan (QAPP) and draft Quality Management Plan was approved by the GLNPO QA Officer in July 2008 (http://epa.gov/greatlakes/monitoring/fish/reports/quality.pdf).

Data Quality Review: GLNPO's Quality Management System has been evaluated as "outstanding" in previous peer and management reviews[4] (see reference #4 below). Specific highlights relative to this indicator include: *"QA requirements are systematically planned using the DQO process. Major programs such as the Open Lakes Monitoring (Lake Guardian sampling activities), Open Lakes Organics Monitoring, the Biology Monitoring, the Great Lakes Fish Monitoring and the Legacy Act program were exemplary in systematic planning and documenting QA requirements." (4)* GLNPO has implemented all recommendations from these external audits and complies with Agency Quality standards.

Data Limitations: Great Lakes Fish Monitoring Program data are not well-suited to portray localized changes. Nevertheless, data collected at a certain site (odd year or even year sites) can be compared to data collected from the same site. In addition, only very general comparisons can be made of contaminant concentrations between lakes. A recent review of the odd year Open Lake Trend Monitoring in Lake Erie data indicate an increased variability in the data between the years of 1999 and 2003 because during those years several individual samples (fish) fell outside of the desired size range leading to a higher or lower than average mean sample size for the composite.

Error Estimate: The data quality objective of the fish contaminant program was to detect a 20% change in each measured contaminant concentration between two consecutively sampled periods at each site. Based on changing environmental conditions, the data quality objective has been tentatively revised to have an 80% probability to detect a 10% change per year, over three to four sampling periods, at the 95% confidence level. An official outside peer review of this new data quality objective and associated data was held on December 11-12, 2007. This peer review assisted in providing a data quality objective and a recommendation to consider dropping the game fish fillet element of the program.

New/Improved Data or Systems: The GLENDA database is a significant new system with enhanced capabilities. Existing and future fish data will be added to GLENDA. GLNPO has awarded a new consortium grant for these analyses that allows researchers from three different universities to specialize in their individual areas of analytical expertise and provide more timely data of a higher quality.

References: Supporting Program Documentation: All journal publications relevant to the Great Lakes Fish Monitoring Program, final project reports, and quality documentation can be found at the GLFMP website, http://www.epa.gov/glnpo/glindicators/fish.html.

1. "*The Great Lakes Fish Monitoring Program - A Technical and Scientific Model For Interstate Environmental Monitoring.*" September, 1990. EPA503/4-90-004.

2. "Quality Management Plan for the Great Lakes National Program Office." EPA905-R-02-009. Revised and approved May 2008. http://www.epa.gov/glnpo/qmp/

3. *"Great Lakes Fish Monitoring Program – Quality Assurance Project Plan for Sample Collection Activities"*, Great Lakes National Program Office. Available at http://www.epa.gov/glnpo/glindicators/fishtoxics/GLFMP_QAPP_082504.pdf

4. "*GLNPO Management Systems Review of 2006."* Available at http://www.epa.gov/glnpo/qmp/qualitysystemsassessment.pdf.

<u>FY 2011 Performance Measure:</u>

- **Number of Beneficial Use Impairments removed within Areas of Concern. (program assessment measure)**

Performance Database: USEPA's Great Lakes National Program Office will track the cumulative total Beneficial Use Impairments (BUIs) removed within the Areas of Concern (AOCs) located entirely within the United States and the AOCs that are shared by both the United States and Canada. Results through September 2011 will be reported in 2011.

Data Source: Internal tracking and communications with Great Lakes States, the US Department of State and the International Joint Commission (IJC).

Methods, Assumptions, and Suitability: Restoration of U.S. or Binational Areas of Concern will ultimately be measured by the removal of all beneficial use impairments, leading to de-listing of all of the U.S. or Binational Areas of Concern by 2025. There were once a total of 43 Great Lakes Areas of Concern: 26 located entirely within the United States; 12 located wholly within Canada; and 5 shared by both countries. There were thus 31 United States or Binational Areas of Concern; however, with the de-listing of the Oswego River AOC, only 30 United States or Binational Areas of Concern

remained at the end of Fiscal Year 2006. Remedial Action Plans for each of these Areas of Concern address one or up to 14 beneficial use impairments associated with these areas. At the end of Fiscal Year 2006, there was a total identified universe of 261 beneficial use impairments reported in the United States or Binational Areas of Concern. This measure tracks cumulative progress against those beneficial use impairments. An impaired beneficial use means a change in the chemical, physical or biological integrity of the Great Lakes system sufficient to cause any of the following:
-restrictions on fish and wildlife consumption
-tainting of fish and wildlife flavor
-degradation of fish wildlife populations
-fish tumors or other deformities
-bird or animal deformities or reproduction problems
-degradation of benthos
-restrictions on dredging activities
-eutrophication or undesirable algae
-restrictions on drinking water consumption, or taste and odor problems
-beach closings
-degradation of aesthetics
-added costs to agriculture or industry
-degradation of phytoplankton and zooplankton populations
-loss of fish and wildlife habitat

Additional information is available at: http://www.epa.gov/glnpo/aoc/index.html

The States work with the local stakeholders in the Areas of Concern to develop delisting criteria for the impaired BUIs. By 2009, all of the Areas of Concern had developed their delisting targets and they are now being used to measure progress in delisting BUIs. The BUI delisting criteria are used to assess when a BUI is restored and can be delisted. After all BUIs in an AOC are delisted, the entire Area of Concern can be delisted.

QA/QC Procedures: GLNPO has an approved Quality Management System in place (see reference #1 below) that conforms to the USEPA Quality Management Order and is audited every 5 years in accordance with Federal policy for Quality Management.

Data Quality Review: GLNPO's Quality Management System has been given "outstanding" evaluations in previous peer and management reviews (see reference #2) below. GLNPO has implemented all recommendations from these external audits and complies with Agency Quality standards.

Data Limitations: None known.

Error Estimate: None.

New/Improved Data or Systems: NA

References:

1. GLNPO maintains tracking for de-listed U.S. or binational Beneficial Use Impairments in office files.

2. *"Quality Management Plan for the Great Lakes National Program Office."* EPA905-R-02-009. Revised and approved May 2008. http://www.epa.gov/glnpo/qmp/.

3. "*GLNPO Management Systems Review of 2006."* Available at http://www.epa.gov/glnpo/qmp/qualitysystemsassessment.pdf.

FY 2011 Performance Measure:

- **Cubic yards of contaminated sediment remediated (cumulative from 1997) in the Great Lakes (program assessment measure)**

Performance Database: Data tracking sediment remediation are compiled in two different formats. The first is a matrix that shows the annual and cumulative totals of contaminated sediment that were remediated in the Great Lakes basin in the reporting year and from 1997 for each Area of Concern or other non-Areas of Concern with sediment remediation. The second format depicts the yearly and cumulative totals on a calendar year basis graphically. These databases are reported approximately one year after the completion of work, thus, results from calendar year 2010 remediation will be reported in FY 2011.

Data Source: GLNPO collects sediment remediation data from various State and Federal project managers across the Great Lakes region, who conduct and coordinate contaminated sediments work, including appropriately characterizing and managing navigational dredging of contaminated sediments. These data are obtained directly from the project manager via an information fact sheet the project manager completes for any site in the Great Lakes basin that has performed any remedial work on contaminated sediment. The project manager also indicates whether an approved Quality Assurance Project Plan (QAPP) was used in the collection of data at the site. GLNPO does not accept unsolicited data without adequate assurance that quality system documentation was in place and the reporters of the data are not likely to be biased.

Methods, Assumptions, and Suitability: GLNPO began tracking sediment remediation actions in the Great Lakes Basin in 1997. At that time, GLNPO's "best guess" of the total number of cubic yards that required remediation in the Great Lakes AOCs was 40 million. In 2004, the U.S. Policy Committee tasked the Great Lakes States with establishing a more comprehensive list of sites requiring remediation in the entire Great Lakes Basin (AOCs and non-AOCs), using best professional judgment to estimate the sediment volumes to be remediated. Using this list of estimated sediment remediation needs created by Great Lakes States in 2004, and sediment remediation estimates reported by Project Managers for calendar years 1997 through 2004, GLNPO estimated the 1997 baseline, or "universe," for contaminated sediments requiring remediation to be 46.5 million cubic yards.

The data collected to track sediment remediation in the Great Lakes show the amount of sediment remediated (removed, capped, undergoing natural recovery, or other) for that year, the amount of sediment remediated in prior years, and the amount of sediment remaining to be addressed for a particular site. This format is suitable for year-to-year comparisons for individual sites. GLNPO sums the volume estimates as provided by the individual project managers, but then rounds the totals. For reporting purposes, the yearly volume total is rounded to the nearest one thousand cubic yards and the cumulative volume total is rounded to the nearest one hundred thousand cubic yards.

QA/QC Procedures: GLNPO relies on the individual government/agency project managers to provide information on whether an approved QAPP was in place during remediation of contaminated sediment. This information is used to decide if the data provided by the project manager are reliable for GLNPO reporting purposes. If an approved QAPP was not used, sediment data would not likely be reported by GLNPO, unless GLNPO finds that alternative information is available that provides sufficient quality documentation for the project and associated data. This approach allows GLNPO to use best professional judgment and flexibility in reporting data from any cases where there was not a QAPP, but (a) the remedial action is noteworthy and (b) the project was conducted by recognized entities using widely accepted best practices and operating procedures.

The tracking database houses information on the calculated amount of sediment remediated at individual sites as provided by the project managers. The individual site project managers are responsible for completing the data request forms, reviewing draft figures to verify that the GLNPO project manager transferred the data correctly, and providing any updated or improved estimates. It is GLNPO's responsibility to determine if the data are usable based upon the information sheet provided by the project managers. GLNPO does not attempt to verify mass and volume estimates due to the variability in how to calculate them. GLNPO ensures that the estimates provided make sense for the site, and that all estimates are reported in the same units. GLNPO management and Sediment Team members review the data, in the graphic and matrix formats, prior to reporting. GLNPO's Sediment Team works closely with partners and has confidence in those who provide data for the summary statistics. This familiarity with partners and general knowledge of ongoing projects allows GLNPO management to detect mistakes or questionable data.

Data Quality Review: The data, in both the graphic and matrix formats, are reviewed by individual project managers, GLNPO's Sediment Team, and management prior to being released. Data quality review procedures are outlined in the QAPP referenced below. GLNPO's Quality Management System has been given "outstanding" evaluations in previous peer and management reviews. (See reference # 5 below). Specific highlights from this review relative to this indicator include: *"Across GLNPO, assessment of the quality of existing data and documentation of the quality of existing data for intended use is a standard practice. This is commendable as the Agency is still attempting to define requirements for usability existing data."* GLNPO has implemented all recommendations from these external audits and complies with Agency Quality Standards.

Data Limitations: The data provided in the sediment tracking database should be used as a tool to track sediment remediation progress at sites across the Great Lakes Basin. Many of the totals for sediment remediation are estimates provided by project managers. For specific data uses, individual project managers should be contacted to provide additional information.

Error Estimate: The amount of sediment remediated or yet to be addressed should be viewed as qualitative data since a specific error estimate is not able to be calculated.

New/Improved Data or Systems: Existing tracking systems are anticipated to remain in place.

References:

1. Giancarlo Ross, M.B. Quality Assurance Project Plan for "Great Lakes Sediment Remediation Project Summary Support." Unpublished – in Great Lakes National Program Office files, June 2008.

2. Giancarlo Ross, M.B. "*Sediment Remediation Matrix".* Unpublished - in Great Lakes National Program Office files.

3. Giancarlo Ross, M.B. "*Sediment Remediation Graphics."* Unpublished - in Great Lakes National Program Office files.

4. Giancarlo Ross, M.B. "Compilation of Project Managers Informational Sheets". Unpublished - in Great Lakes National Program Office files

5. "*GLNPO Management Systems Review of 2006."* Available at http://www.epa.gov/glnpo/qmp/qualitysystemsassessment.pdf.

6. "Indicator 3: Sediment Contamination." Unpublished – in Great Lakes National Program Office files.

<u>FY 2011 Performance Measure</u>:

- **Cost per cubic yard of contaminated sediments remediated (cumulative) (program assessment efficiency measure)**

Performance Database: Data tracking sediment remediation volumes and costs are compiled for all Great Lakes Legacy Act (GLLA) projects. As all GLLA projects are managed by GLNPO, project volumes and costs are generally available within 2-3 months of project completion. This database is updated with cost and volume numbers at the completion of each GLLA sediment clean-up project.

Data Source: GLNPO collects sediment remediation data for all the GLLA projects. At the completion of each project a hydrographic survey is conducted that provides accurate volumes for dredged/remediated sediments at all GLLA projects. This information is collected using an approved Quality Assurance Project Plan (QAPP). All GLLA projects require a QAPP prior to conducting work at the site. GLNPO does not accept data without adequate assurance that a QAPP was in place and the reporters of the data are not likely to be biased. Following the completion of a project, a final report is developed that includes information on dredged/remediated sediment volumes. Also, at the close of each project a final accounting is conducted to provide accurate final cost estimates.

Methods, Assumptions, and Suitability: This measure allows comparison of the actual cost of remediating Great Lakes contaminated sediments (pursuant to the Great Lakes Legacy Act) to a threshold cost of $200 per cubic yard. The target is achieved when the actual cost of contaminated sediment remediation (cumulative) pursuant to the Legacy Act is less than or equal to $200 per cubic yard. The program does not anticipate that actual costs per cubic yard would decrease each year, particularly since project costs are expected to increase as they become more complicated and disposal costs increase in future years.

The estimated sediment remediation cost target of $200 per cubic yard has been determined using best professional judgment. Reference points include a 2004 effort by the U.S. Great Lakes Policy Committee and a January 2007 paper on Environmental Dredging Costs analyzing 64 completed environmental dredging projects.

Targets and results will be reported on a calendar year basis. The program will use total funding as the basis of this measure, but will also track federal and non-federal dollars. Final project costs and the quantity of cubic yards of contaminated sediments will be calculated using cumulative numbers.

Data are collected to track the amount of sediment remediated and project cost. Projects are not included in the database until they are completed; partial project information is not reported for this measure.

QA/QC Procedures: GLNPO has a QA Manager who is responsible for approval of the QAPP for all GLLA projects. A QAPP is required for each GLLA project and an ongoing draft of a Quality Management Plan for the GLLA is used as an overall quality management guide. Part of this site-specific QAPP includes information on the hydrographic surveys used to determine volume estimates for each project. EPA contractors oftentimes accompany the surveying crew to ensure all procedures are followed. This information is typically made available approximately 2-3 months following project completion.

Data Quality Review: The data, in both the graphic and matrix formats, are reviewed by individual project managers, GLNPO's Sediment Team, and management prior to being released. GLNPO's Quality Management System has been given "outstanding" evaluations in previous peer and management reviews (see Reference #4 below).

GLNPO has implemented all recommendations from these external audits and complies with Agency Quality Standards.

Data Limitations: The data generated from this efficiency measure should be used as an indicator of the general trend in the costs of sediment remediation under the Great Lakes Legacy Act.

Error Estimate: A specific error estimate is not available.

New/Improved Data or Systems: The recent GLNPO Quality Management Review of GLNPO from July of 2006 highlighted the following improvements:

> "*Management of the Great Lakes Legacy program is exemplary. Ensuring conformance with EPA's quality requirements was evident in the creative approach to planning and overseeing quality throughout the life cycle of the project. The draft 2005 Quality Implementation and Management Plan is comprehensive. QA plans reviewed were detailed and appropriately approved. Post project meetings with EPA, state partners and local advisory councils to review project with focus on detailing lessons learned is a best practice. Data Quality Assessment to determine opportunities for improvement is a critical component of the QA Project Plan. The project officers are to be commended for the documented life cycle management for the Great Lakes Legacy Act Program.* (4)

References:

1. *Estimates of Great Lakes Sediment Remediation Needs*. U.S. Great Lakes Policy Committee. January 11, 2005. Unpublished - in USEPA GLNPO files.

2. Estes, T.J. 2007. *Environmental Dredging Project Costs--The Mystery. The Mystique, The Muddle.* Proceedings of the Fourth International Conference on Remediation of Contaminated Sediments.

3. Tuchman, M and Alexander, M. 2007. *Remediation of the Black Lagoon, Trenton, Michigan, Great Lakes Legacy Program.* Draft Report.

4. "*GLNPO Management Systems Review of 2006."* Available at http://www.epa.gov/glnpo/qmp/qualitysystemsassessment.pdf.

<u>FY 2011 Performance Measure</u>:

- **Number of Areas of Concern in the Great Lakes where all management actions necessary for delisting have been implemented (cumulative)**

Performance Database: USEPA's Great Lakes National Program Office will track the cumulative number of management actions (including sediment remediation and habitat restoration) that take place to achieve beneficial use impairment (BUI) targets at the

Areas of Concern (AOCs) located solely within the United States (25) and the ones shared with Canada (5). Results through September 2011 will be reported in 2011.

Data Source: Internal tracking and communications with Great Lakes States, the relevant community groups at the AOCs, other interested groups, the US Department of State and the International Joint Commission (IJC).

Methods, Assumptions, and Suitability: Restoration of U.S. or Binational AOCs will ultimately be measured by the removal of all BUIs, leading to de-listing of all of the U.S. or Binational AOCs by 2025. There were once a total of 43 Great Lakes AOCs: 26 located entirely within the United States; 12 located wholly within Canada; and 5 shared by both countries. There were thus 31 United States or Binational AOCs; however, with the de-listing of the Oswego River AOC, 30 United States or Binational AOCs remained at the end of Fiscal Year 2006. Remedial Action Plans (RAPS) for each of these AOCs address one or up to 14 BUIs associated with these areas.

This measure tracks the number of reasonable and realistic management actions that could take place in order to show cumulative progress to remove those BUIs. An impaired beneficial use means a change in the chemical, physical or biological integrity of the Great Lakes system sufficient to cause any of the following:
-restrictions on fish and wildlife consumption
-tainting of fish and wildlife flavor
-degradation of fish wildlife populations
-fish tumors or other deformities
-bird or animal deformities or reproduction problems
-degradation of benthos
-restrictions on dredging activities
-eutrophication or undesirable algae
-restrictions on drinking water consumption, or taste and odor problems
-beach closings
-degradation of aesthetics
-added costs to agriculture or industry
-degradation of phytoplankton and zooplankton populations
-loss of fish and wildlife habitat

Additional information is available at: http://www.epa.gov/glnpo/aoc/index.html

The States work with the local stakeholders in the AOCs to develop delisting criteria for the impaired BUIs. The BUI delisting criteria are used to assess when a BUI is restored and can be delisted. By 2009, all of the National and Binational AOCs had developed their delisting targets and they are now being used to measure progress in delisting BUIs. Along with these targets, the respective AOCs and the States have developed a Stage 2 RAP or an equivalent document that outlines the reasonable and realistic management actions that could be taken to delist the relevant BUIs and, hence, the AOC. After all BUIs in an AOC are delisted, the entire Area of Concern can be delisted. Reasonable and realistic management actions refer to those set of local, state and federal actions that

could be taken to remove the impairment. These actions may not result in the immediate delisting of a set of BUIs but these actions will remove the contaminant threat that will allow environmental conditions to improve over time which will lead to eventual delisting of the AOC.

QA/QC Procedures: GLNPO has an approved Quality Management System in place (see reference #2 below) that conforms to the USEPA Quality Management Order and is audited every 5 years in accordance with Federal policy for Quality Management.

Data Quality Review: GLNPO's Quality Management System has been given "outstanding" evaluations in previous peer and management reviews (see reference #2) below. GLNPO has implemented all recommendations from these external audits and complies with Agency Quality standards.

Data Limitations: None known.

Error Estimate: None.

New/Improved Data or Systems: NA

References:

1. GLNPO maintains tracking for de-listed U.S. or binational Beneficial Use Impairments in office files.

2. *"Quality Management Plan for the Great Lakes National Program Office."* EPA905-R-02-009. Revised and approved May 2008. http://www.epa.gov/glnpo/qmp/

3. "*GLNPO Management Systems Review of 2006."* Available at http://www.epa.gov/glnpo/qmp/qualitysystemsassessment.pdf.

4. Compilation of "Stage 1 and 2 Remedial Action Plans" and "Delisting Targets for Areas of Concern" for 25 National 5 Binational AOCs. Various approval dates and documents are located at the respective local, state and federal offices.

<u>FY 2011 Performance Measure</u>:

- **Number of nonnative species newly detected in the Great Lakes ecosystem**

Performance Database: Great Lakes Aquatic Nonindigenous Species Information System (GLANSIS). GLANSIS functions as a Great Lakes specific node of the USGS Nonidigenous Aquatic Species (NAS) national database. Information entered for GLANSIS automatically appears in NAS. GLANSIS provides targeted access to the information – especially collection records – for established Great Lakes nonindigenous species in the NAS Database.

Data Source: Verified observations of new species by Great Lakes surveillance and researchers agencies and institutions, as subsequently subjected to review as described in QA/QC procedures (below).

Methods, Assumptions, and Suitability: The Great Lakes have a long history of aquatic nonindigenous species (ANS) introductions – both intentional and unintentional. A number of ongoing federal programs are working to reduce the rate of introductions. The increased effort to address invasive species through GLRI funding will reduce the rate of introductions. During the ten-year period prior to the Great Lakes Restoration Initiative (2000-2009), thirteen new invasive species were discovered within the Great Lakes. This is a baseline rate of invasion of 1.3 species per year. Changes in rate will be assessed by extending this cumulative average into the time period of the GLRI (2000-present).

This methodology assumes that the detection of invasive species in the environment correlates with actual invasion rates. It is recognized that there can be lag time in discovery (discussed in more detail under error estimate). This performance measure also assumes that rate of detection is directly reflective of the GLRI effort. Because the Great lakes ecosystem receives the input of a number of vectors that introduce invasive species -- including, live organisms in commerce, canals/waterways, ballast water, and recreational and resource users activities -- the results of the GLRI effort cannot be measured independently from the suite of other ongoing programs at work in the Great Lakes.

This performance measure is suitable for providing a basic pulse toward the long-term goal of establishing a no-tolerance policy for new introductions. Invasive species programs are in a very early stage of development and many regulatory and programmatic gaps still exist.

QA/QC Procedures: The list of aquatic nonindigenous species found via GLANSIS is subject to constant revision. Based on these criteria:

Geographic criterion: Only species which are established in the Great Lakes basin below the ordinary high water mark -- including connecting channels, wetlands and waters ordinarily attached to the Lakes -- are included in the GLANSIS database. Species which have invaded inland lakes within the Great Lakes basin but not meeting the above geographic criterion are not included in the database.

Aquatic criterion: GLANSIS includes only aquatic species. USDA wetland indicator status (see http://plants.usda.gov/wetland.html) is used as a guideline for determining whether wetland plants should be included in the list - species that typically require wetlands are included, upland species are not

.

Nonindigenous criterion: The species included in GLANSIS are those which are considered nonindigenous within the Great Lakes basin according to the following definitions and criteria (based on Ricciardi 2006): the species appeared suddenly and had

not been recorded in the basin previously; it subsequently spreads within the basin; its distribution in the basin is restricted compared with native species; its global distribution is anomalously disjunct (i.e. contains widely scattered and isolated populations); its global distribution is associated with human vectors of dispersal; the basin is isolated from regions possessing the most genetically and morphologically similar species.

Cryptogenic species are those species that cannot be verified as either native or introduced (after Carlton, 1996). Species that have been identified as cryptogenic are generally not listed, but are being considered for inclusion in a separate list or in the main GLANSIS list with an appropriate identifier.

Species which have expanded their ranges within the basin (e.g., those native to Lake Ontario which have invaded Lake Superior) are not systematically included in the main GLANSIS list but are being considered for inclusion in a separate list or in the main GLANSIS list with an appropriate identifier. The only species presently included in GLANSIS that violates the criterion of no previous evolutionary history in the Great Lakes basin is the sea lamprey.

Note: Although widely used, the term 'invasive' is vague and subject to widely inconsistent usage. Biologically it is often related to the relative ability of a species to spread and establish in new areas, while legislatively and politically it is used to characterize a nonindigenous species "whose introduction does or is likely to cause economic or environmental harm or harm to human health" (Executive Order 13112, February 1999). Thus, the term 'invasive' has multiple meanings and requires a subjective judgment. We avoid using the term 'invasive', but may use the word 'invader', in the context that a nonindigenous species that has successfully established a reproducing population is an 'invader'. 'Exotic' is a commonly used synonym for 'nonindigenous'.

Established criterion: A nonindigenous species is considered established if it has a reproducing population within the basin, as inferred from multiple discoveries of adult and juvenile life stages over at least two consecutive years. Given that successful establishment may require multiple introductions, species are excluded if their records of discoveries are based on only one or a few non-reproducing individuals whose occurrence may reflect merely transient species or unsuccessful invasions.

Data Quality Review: Quality documentation for this measure has not yet been reviewed and approved through GLNPO's Quality Program.

Data Limitations: The number of Great Lakes aquatic nonindigenous species documented in GLANSIS is to be interpreted as a minimum. Identification depends on discovery and verification, which is, in turn, dependent on sampling effort.

Error Estimate: The GLRI effort will increase surveillance of the Great Lakes for invasive species. Enhanced monitoring will potentially result in the discovery of organisms that were established prior to GLRI but were not detected by lower levels of sampling. This problem of lag time is well known in ecology, but limited studies have

been performed in the Great Lakes. Recent publications (Grigorovich 2008, Trebitz 2009) have documented how increased sampling in Duluth Harbor discovered previously undocumented species. It is unknown when they were first introduced and would not have been discovered except for the intense sampling design. They will be reported as "discovered" in 2006. It is expected that similar cases will occur as increase sampling is done in other high-risk harbors in the Great Lakes. The problem of lag time will decrease once comprehensive prevention programs are in place and operating over time. This will reduce the uncertainty due to lag-time and make the “rate of discovery” statistic more likely to reflect the actual rate of invasion.

New/Improved Data or Systems: NA

References:

1. Bryan, M.B, D. Zalinski, B. Filcek, S. Libants, W. Li, and K.T. Scribner. 2005. Patterns of invasion and colonization of the sea lamprey. Molecular Ecology 14:3757–3773

2. Carlton J.T. 1996. Biological invasions and cryptogenic species. Ecology 77:1653-55

3. Lawrie, A. H. 1970. The sea lamprey in the Great Lakes. Transactions of the American Fisheries Society 99:766-775.

4. Mills EL, Leach JH, Carlton JT, Secor CL. 1993. Exotic species in the Great Lakes: a history of biotic crises and anthropogenic introductions. J. Great Lakes Res. 19: 1–54.

5. Ricciardi A. 2001. Facilitative interactions among aquatic invaders: is an “invasional meltdown” occurring in the Great Lakes? Can. J. Fish. Aquat. Sci. 58: 2513-2525.

6. Ricciardi A. 2006. Patterns of invasion in the Laurentian Great Lakes in relation to changes in vector activity. Divers. Distrib. 12, 425–433.

7. Smith, B. R., and J. J. Tibbles. 1980. Sea lamprey (Petromyzon marinus) in Lakes Huron, Michigan, and Superior: history of invasion and control, 1936-78. Canadian Journal of Fisheries and Aquatic Sciences 37(11):1780-1801.

8. Bailey, R.M., and G.R. Smith. 1981. Origin and geography of the fish fauna of the Laurentian Great Lakes basin.Canadian Journal of Fisheries and Aquatic Sciences. National Research Council Canada vol:38 iss:12 pgs:1539-1561

9. Daniels, R. A. 2001. Untested assumptions: the role of canals in the dispersal of sea lamprey, alewife, and other fishes in the eastern United States. Env. Biol. of Fishes. vol:60 pgs:309-329

10. Mandrak, N. E., and E. J. Crossman. 1992. Postglacial dispersal of freshwater fishes into Ontario. Canadian Journal of Zoology 70:2247-2259.

11. Smith, S. H. 1995. Early changes in the fish community of Lake Ontario. Great Lakes Fishery Commission Technical Report 60, Ann Arbor.

12. Grigorovich , I.A. 2008. The Quagga Mussel Invades the Lake Superior Basin. Journal of Great Lakes Research. 34:342–350

13. Trebitz A.S. et al (2009) Exploiting habitat and gear patterns for efficient detection of rare and non-native benthos and fish in Great Lakes coastal ecosystems. Aquatic Invasions, Volume 4, Issue 4: 651-667

FY 2011 Performance Measure:

- **Acres managed for populations of invasive species controlled to a target level. (cumulative)**

Performance Database: GLRI Accountability System database.

Data Source: As a condition of GLRI Interagency Agreements, Federal Agencies are required to track performance and submit data to USEPA on this measure including work performed via subsequent contracting and granting arrangements.

Methods, Assumptions, and Suitability: The cumulative total number acres will be calculated by simple summation using the GLRI Accountability System database. This database will be developed pending approval of Information Collection Request (ICR) to the Office of Management and Budget (OMB), currently in public comment phase. [EPA ICR No. 2379.01, OMB Control No. 2005–NEW]

QA/QC Procedures: GLNPO has an approved Quality Management System in place that conforms to the USEPA Quality Management Order and is audited every 5 years in accordance with Federal policy for Quality Management.

Data Quality Review: Quality documentation for this measure has not yet been reviewed and approved through GLNPO's Quality Program.

Data Limitations: None known.

Error Estimate: None.

New/Improved Data or Systems: NA

FY 2011 Performance Measure:

- **Number multi-agency rapid response plans established, mock exercises to practice responses carried out under those plans, and/or actual response actions. (cumulative)**

Performance Database: GLRI Accountability System database.

Data Source: As a condition of GLRI Interagency Agreements, Federal Agencies are required to track performance and submit data to USEPA on this measure including work performed via subsequent contracting and granting arrangements.

Methods, Assumptions, and Suitability: The cumulative total number plans developed and exercises conduced will be calculated by simple summation using the GLRI Accountability System database. This database will be developed pending approval of Information Collection Request (ICR) to the Office of Management and Budget (OMB), currently in public comment phase. [EPA ICR No. 2379.01, OMB Control No. 2005–NEW]

QA/QC Procedures: GLNPO has an approved Quality Management System in place that conforms to the USEPA Quality Management Order and is audited every 5 years in accordance with Federal policy for Quality Management.

Data Quality Review: Quality documentation for this measure has not yet been reviewed and approved through GLNPO's Quality Program.

Data Limitations: None known.

Error Estimate: None.

New/Improved Data or Systems: NA

FY 2011 Performance Measure:

- **Five year average annual loadings of soluble reactive phosphorus (metric tons per year) from tributaries draining targeted watersheds**

Performance Database: Loadings information will be incorporated into the standard USGS database, NWIS.

Data Source: Various State, Federal, and local agencies collect dissolved phosphorus data across the Great Lakes region. Water-quality data are stored in various databases: STORET (EPA data base), NWIS (USGS data base), or those of individual State and local agencies. Note: not all State and local agencies incorporate their data into Federal databases. Note: not all agencies collect soluble reactive phosphorus data, some collect dissolved phosphorus data. Agencies monitoring the rivers of interest collect their data in accordance with approved standard procedures. Streamflow data for the rivers of interest are collected by the USGS. All streamflow data are stored in the standard USGS database, NWIS.

Methods, Assumptions, and Suitability: Water-quality data and streamflow data will be collected in accordance with approved standard procedures of the USEPA and USGS.

These data will then be used to compute annual loads of Soluble Reactive Phosphorus in each river. Loads will be computed by means of one of two different approaches: a rating curve/regression approach method such as Estimate (Cohn, et al. 1989) or Fluxmaster (Schwarz et al. 2006); or the Beale's ratio estimator approach (Beale, 1962). Other general assumptions include:

1. Dissolved phosphorus is similar to soluble reactive phosphorus; if soluble reactive phosphorus is not monitored in each river.
2. The soluble reactive phosphorus concentrations collected represent conditions over the entire ranges of flows experienced in each year.
3. Annual load estimation approaches, with their inherent errors, can be used to describe small changes in 5-year average loads.
4. Loads computed for a five-year period represent the true average of hydrologic conditions that typically have an 11 to 13 year cycle resulting from interannual changes in hydrology.

QA/QC Procedures: Streamflow will be collected by the USGS and will follow all standard QA/QC procedures outlined in U.S. Geological Survey by Rantz (1982) and Mueller and Wagner (2009). Water-quality data will be collected by Federal, State, and local agencies following their specified protocols in accordance with standard USEPA approved protocols. Each agency will follow specified field and laboratory QA/QC procedures consisting of blanks, replicates, and spikes. Additionally, data analyses must be performed by laboratories that have gone through a recognized laboratory evaluation/accreditation process including participation in ongoing blind testing programs to provide performance data. Quality documentation for this measure has not yet been reviewed and approved through GLNPO's Quality Program.

Data-Quality Review: Annual load data will be reviewed by individual project managers and Published in Annual Reports. Specific data-quality review procedures depend on who is going to compute the loads and how the loads are computed.

Data Limitations: Annual loads represent an integration of current and historical land use practices and climatic conditions during each year. Therefore, changes in the five year average loads may not be caused by changes in practices applied in the watershed.

Error Estimate: Streamflow and water-quality data are incorporated into load computation programs. The load computation program will be used to construct 95% confidence limits on each annual load. It is assumed that these errors incorporate all sampling and estimation errors.

New/Improved Data or Systems: None.

References:

1. Beale, E.M.L. 1962. Some uses of computers in operational research. Industrielle Organisation 31:51-52.

2. Cohn, T.A., L.L DeLong, E.J. Gilroy, R.M. Hirsch, and D.E Wells. 1989. Estimating Constituent Loads. Water Resources Research, 25(5), pp. 937-942.

3. Rantz, S.E. 1982. Measurement and computation of streamflow; Volume 1, measurement of stage and discharge; Volume 2, computation of discharge, US Geological Survey Water-Supply Paper vol. 2175, U.S. Geological Survey, Washington, D.C..
4. Mueller, D.S., and Wagner, C.R., 2009, Measuring discharge with acoustic Doppler current profilers from a moving boat: U.S. Geological Survey Techniques and Methods 3A-22, 72 p. (available online at http://pubs.water.usgs.gov/tm3a22)

5. Schwarz, G.E., Hoos, A.B., Alexander, R.B., and Smith, R.A., 2006, SPARROW-MOD: user documentation for the SPARROW surface water-quality model: U.S. Geological Survey Techniques and Methods, book 6, section B, Surface water, chapter 3 (6–B3).

FY 2011 Performance Measure:

- **Percentage of beaches meeting bacteria standards 95% or more of beach days**

Performance Database: Under the Agency's Beaches Environmental Assessment and Coastal Health (BEACH) Act Grant Program, states (territories and eligible tribes) that receive BEACH Act grants are required to submit their beach monitoring (water quality), notification (advisory and closing), and beach location data to EPA. Beach program managers submit beach advisory data to EPA through CDX. Local beach program and advisory data are stored in EPA's PRAWN (Program tracking, beach advisory water quality standards, and nutrient) database. Beach water quality data is stored in EPA's STORET database.

Historical beach swimming season data can be viewed in EPA's BEACON database (Beach Advisory and Closing Online Notification system) which can be accessed at: http://oaspub.epa.gov/beacon/beacon_data.about_beacon. EPA created BEACON to meet the Agency's BEACH Act requirements. The BEACH Act (section 406(e)) requires EPA to make a national coastal recreation water pollution occurrence database, which contains state reported beach monitoring and notification data available to the public by electronic means. In BEACON, each beach is geographically displayed on a map that links the beach to data. Users select a beach and view the available data for that beach by either first choosing a state and county or typing the beach name.

Data Source: EPA collects coastal beach monitoring and notification data from States that receive BEACH Act grants to implement beach monitoring and notification programs. These data are obtained directly from the Great Lakes beach managers who submit their data to their state beach program managers throughout the beach season. The state beach managers then send the data electronically to EPA by January 31 of each year, as required by the BEACH Act.

Methods, Assumptions, and Suitability: The data collected to track beach advisories and closures in the Great Lakes show the amount of water quality standards exceedances (>235 *E. coli* cfu/100 ml of water) for each beach throughout the beach season (Memorial Day through Labor Day). This format is suitable for year-to-year comparisons for individual beaches; however, it is not useful for *comparing* water quality at other Great Lakes beaches. Monitoring frequencies vary among states and local entities from between once a week to seven days a week, so the minimally monitored beaches appear to have better water quality.

EPA summarizes the previous swimming season's results and reports the information each year (around Memorial Day). The report lists the number of beaches with notification actions, duration of notification actions, and what percentage of days beaches were under a notification action. EPA calculates the total available beach days and the number of beach days with advisories or closures to track trends over time. To calculate the total available beach days, EPA sums the length of each state's beach season multiplied by the number of beaches in the state.

QA/QC Procedures: To comply with 40 CFR 31.45, which states that if a grantee's project involves environmentally related measurements or data generation, states must develop and implement a quality management system that is sufficient to produce data of a quality adequate to meet the beach project objectives, states must submit a quality assurance project plan (QAPP) or equivalent documentation. Each BEACH Act grantee has an approved beach monitoring QAPP in place that is update annually.

Data Quality Review: EPA conducts a quality check of the beach data submitted. EPA has designed quality assurance checks into the information transfer software to ensure the information is secure and that only the appropriate people in state and territorial governments can send the information. EPA then reviews the incoming data to flag potential data errors and works with the state governments to correct any errors.

Data Limitations: As indicated above, tracking beach advisory and closure information is suitable for year-to-year comparisons for individual beaches; however, it is not useful for *comparing* beach water quality with other Great Lakes beaches. Monitoring frequencies vary among states and local entities from between once a week to seven days a week, so the minimally monitored beaches appear to have better water quality. In addition, the measure does not indicate whether a program is effective. Beach water quality exceedances are due to many factors, most of which beach managers do not have any control over (*e.g.*, rainfall amount, duration and intensity, wave action, current).

Error Estimate: Not available.

New/Improved Data or Systems: Existing beach data tracking systems are anticipated to remain in place.

References:

1. U.S. EPA's Beach Monitoring & Notification Data User Corner available at: http://www.epa.gov/waterscience/beaches/grants/datausers/index.htm

2. U.S. EPA, *EPA's BEACH Report: 2008 Swimming Season*, May 2009 (EPA 823-F-09-005).

3. U.S. EPA, *National Beach Guidance and Required Performance Criteria for Grants*, June 2002 (EPA-823-B-02-004).

FY 2011 Performance Measure:

- **Acres in Great Lakes watershed with USDA conservation practices implemented to reduce erosion, nutrients and/or pesticide loading**

Performance Database: USDA Natural Resources Conservation Service's National Conservation Planning Database and Performance Results System.

Data Source: The Natural Resources Conservation Service (NRCS) provides financial and technical assistance to private landowners and producers throughout the United States through one-on-one assistance at the farm level. The results of that assistance are documented at the field office level using the NRCS National Conservation Planning Database (NCP). The Performance Results System (PRS) reports performance in various ways based on established performance measure business definitions.

Methods, Assumptions, and Suitability: Natural Resources Conservation Service staff and conservation partners enter geo-located conservation planning and application information into the NCP daily. This data is the result of landowner/producer planning decisions and in-field certification of applied conservation practices. Certification occurs only after an applied practice meets NRCS standards and specifications. Conservation planning is the process through which decision-makers, land owners or producers, voluntarily agree to a recommended series of conservation practices or systems designed to address the natural resource concern, such as sheet and rill or gully erosion, surface or subsurface nutrient loading or animal agriculture. Other concerns, such as wildlife habitat and sustainable agriculture, may also be addressed. Conservation planning and application documentation warehoused in the NCP are date-stamped, geo-referenced and linked to an employee ID, enabling detailed quality-assurance reviews. Periodic in field reviews (spot checkes) are conducted to assess the accuracy of reported field data.

QA/QC Procedures: Conservation planning and application is reported through the Performance Results System (PRS) using data stored in the NCP. Numerous data quality mechanisms within PRS ensure the completeness of each performance record entry. Each performance record must adhere to a set of quality assurance requirements during the upload process to be credited towards Agency performance. Conservation planning and application documentation is entered into the NCP by field office personnel. Field staffs are trained and skilled in conservation planning and application suited to the local resource conditions. The information used to develop conservation plans is obtained

from on-site resource evaluation, observation, and measurement. Practices applied according to the conservation plan are certified as meeting NRCS standards and specifications. These standards are specific to the practice and ensure the application will address the identified resource concern. Quality Assurance processes are in place at the field, area, state and national level to ensure data entry into the NCP is accurate. Detailed QA/QC is performed on all data entries quarterly.

Data Quality Review: Beginning FY 2009 quarterly detailed QA/QC based field level queries were performed on all entered data. As a result, confidence in entered data is good. Data entry error checking and automated (real time) QA/QC is in development to improve the QA/QC process, capture potential errors at the point of data entry, and increase staff field time. Quality documentation for this measure has not yet been reviewed and approved through GLNPO's Quality Program.

Data Limitations: Conservation planning and application performance is year and program specific. A series of integrated conservation practices may be applied to the same land unit using one or more available programs over a series of years. In addition, a land unit or farm operation may be replanned due to a significant change in the operation or change in owner/operator. For these reasons the cumulative acreage planned or applied over multiple years may not reflect unique acres.

Error Estimate: Initial QA/QC data queries at the national level have shown less than a five percent error rate. A specific error estimate is not available.

New/Improved Data or Systems: Data entry error checking and automated (real time) QA/QC is in development to improve the QA/QC process, capture potential errors at the point of data entry, and increase staff field time.

FY 2011 Performance Measure:

- **% of populations of native aquatic non-threatened and endangered species self-sustaining in the wild. (cumulative)**

Performance Database: The U.S. Fish and Wildlife Service (Service) Fisheries Information System (FIS), a component of the Environmental Conservation Online System (ECOS) (see reference below). Data on aquatic taxa are compiled annually to meet performance reporting and budgetary requirements to the Department of the Interior, Office of Management and Budget, and Congress.

Data Source: The Service's Fisheries Program is the principal source of data for the FIS. Cooperating organizations include other federal agencies, states, Tribes, and non-governmental partners that assist with population assessment and monitoring.

Methods, Assumptions, and Suitability: The FIS *Populations Module* provides information on what is known about populations of aquatic species (i.e., status, trend, geographic location, management plans, etc.) and has broad scientific utility. Population

data are updated annually in FIS to reflect most recent population and habitat assessment information, and are reported on an annual basis (September of the fiscal year) to the Department of the Interior, Office of Management and Budget, and Congress in the Service's Operational Plan.

QA/QC Procedures: Population data are collected by sources identified above and entered into the web-based FIS program by Service field office staff. Regional data are compiled and submitted to headquarters program staff for review and approval.

Data Quality Review: The Service has approved data quality management practices in place. Data in FIS are open for examination by internal and external audit. The Fisheries Program received an "Effective" assessment rating as a result of the Program Assessment Rating Tool (PART) in 2006. The Fisheries Program continues to implement recommendations as identified in the PART *Improvement Plan* and complies with agency quality standards. Quality documentation for this measure has not yet been reviewed and approved through GLNPO's Quality Program.

Data Limitations: Outcome-level performance measures as documented through the FIS Populations Module are critical connections between field-based conservation action and regional and national-level funding and accountability. Completeness and accuracy of information in the module is dependent on Service biologists entering the data.

Error Estimate: None

New/Improved Data or Systems: The FIS modules are continually being reviewed and updated to reflect new scientific information and changing reporting needs. The online sytem will eventually provide public access to the population information.

References:

Environmental Conservation Online System, U.S. Fish and Wildlife Service, http://ecos.fws.gov/ecos/indexPublic.do, http://ecos.fws.gov/ecos/about.do

1. *Fisheries Information System*, U.S. Fish and Wildlife Service, Division of Fisheries and Habitat Conservation, Arlington, VA. 2006 http://www.fws.gov/fisheries/fwco/pdfs/factsheets/FIS.pdf

2. *U.S. Fish and Wildlife Service Program Assessment Rating Tool Results*, Fisheries Program 2006. http://www.fws.gov/Planning/Documents/PART/Fisheries.pdf

<u>FY 2011 Performance Measure</u>:

- **Number of acres of wetlands and wetland-associated uplands protected, restored and enhanced. (cumulative)**

Performance Database: EPA's Great Lakes National Program Office (GLNPO) will track the cumulative total of acres of wetlands and wetland-associated uplands protected, restored and enhanced at the end of each Fiscal Year beginning in Fiscal Year 2010.

Data Source: Internal tracking and communications with the following federal agencies: U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (FWS), National Oceanic and Atmospheric Administration (NOAA), U.S. Army Corps of Engineers (USACE), Bureau of Indian Affairs (BIA), National Park Service (NPS), U.S. Geological Service (USGS), Great Lakes Fishery Commission (GLFC), U.S.D.A. Forest Service (FS), Natural Resource Conservation Service (NRCS), and Federal Highways Administration (FHWA).

Methods, Assumptions, and Suitability: Each agency mentioned above will provide information about cumulative wetlands and wetland-associated upland acres protected, restored and enhanced by agency staff, grantees, and contractors. Information will be input to the Great Lakes Restoration Initiative (GLRI) Accountability Database. GLNPO will compile and distill information into a yearly GLRI report.

QA/QC Procedures
GLNPO has an approved Quality Management System in place that conforms to the USEPA Quality Management Order and is audited every 5 years in accordance with Federal policy for Quality Management.

Data Quality Review
Quality documentation for this measure has not yet been reviewed and approved through GLNPO's Quality Program.

Data Limitations: Tracking is dependent on each agency's staff, grant and contract reporting requirements as well as accurate reporting or project accomplishments by project managers.

Error Estimate: None

New/Improved Data or Systems: Great Lakes Restoration Initiative Accountability System

References
1. GLNPO will develop and maintain the appropriate tracking system for cumulative total of acres of wetlands and wetland-associated uplands protected, restored and enhanced.

<u>FY 2011 Performance Measure</u>:

- **Number of acres of coastal, upland, and island habitats protected, restored and enhanced. (cumulative)**

Performance Database: EPA's Great Lakes National Program Office will track the cumulative total of acres of coastal, upland, and island habitats protected, restored and enhanced at the end of each Fiscal Year beginning in Fiscal Year 2010.

Data Source: Internal tracking and communications with the following federal agencies: U.S. Environmental Protection Agency (EPA), U.S. Fish and Wildlife Service (FWS), National Oceanic and Atmospheric Administration (NOAA), U.S. Army Corps of Engineers (USACE), Bureau of Indian Affairs (BIA), National Park Service (NPS), U.S. Geological Service (USGS), Great Lakes Fishery Commission (GLFC), U.S.D.A. Forest Service (FS), Natural Resource Conservation Service (NRCS), and Federal Highways Administration (FHWA).

Methods, Assumptions, and Suitability
Each agency mentioned above will provide information about cumulative coastal, upland, and island habitats acres protected, restored and enhanced by agency staff, grantees, and contractors. Information will be input to the Great Lakes Restoration Initiative (GLRI) Accountability Database. GLNPO will compile and distill information into a yearly GLRI report.

The definition of coastal is sand beaches and dunes, forests, alvars and other non-wetland habitats.

QA/QC Procedures
GLNPO has an approved Quality Management System in place that conforms to the USEPA Quality Management Order and is audited every 5 years in accordance with Federal policy for Quality Management.

Data Quality Review
Quality documentation for this measure has not yet been reviewed and approved through GLNPO's Quality Program.

Data Limitations: Tracking is dependent on each agency's staff, grant and contract reporting requirements as well as accurate reporting or project accomplishments by project managers.

Error Estimate: None

New/Improved Data or Systems: Great Lakes Restoration Initiative Accountability System

References
1. GLNPO will develop and maintain the appropriate tracking system for cumulative total of acres of coastal, upland, and island habitats protected, restored and enhanced.

<u>FY 2011 Performance Measure:</u>

- **Improve the overall ecosystem health of the Great Lakes by preventing water pollution and protecting aquatic systems**

Performance Database: USEPA's Great Lakes National Program Office (GLNPO) will collect and track the eight (8) components of the index and publish the performance results as part of annual reporting under the Government Performance and Results Act (GPRA) and as online reporting of GLNPO's monitoring program, <http://epa.gov/glnpo/glindicators/index.html> . Extensive databases for the indicator components are maintained by GLNPO (phosphorus concentrations, contaminated sediments, benthic health, fish tissue contamination), by binational agreement with Environment Canada (air toxics deposition), and by local authorities who provide data to the USEPA (drinking water quality, beach closures). A binational team of scientists and natural resource managers is working to establish a long term monitoring program to determine extent and quality of coastal wetlands.

Data Source: Data for the index components are tracked internally and generally reported through the State of the Lakes Ecosystem Conference (SOLEC) process. The document, "State of the Great Lakes 2009 - A Technical Report" presents detailed indicator reports prepared by primary authors, including listings of data sources. Depending on the indicators, data sources may include U.S. and Canadian federal agencies, state and provincial agencies, municipalities, research reports and published scientific literature. Information from the following indicators is used to evaluate the Index components:

Coastal Wetlands group of indicators:
- *Coastal Wetland Amphibian Diversity and Abundance*
- *Contaminants in Snapping Turtle Eggs*
- *Coastal Wetland Bird Community Diversity and Abundance*
- *Coastal Wetland Area by Type*
- *Coastal Wetland Plant Community Health*
- Effects of Water Levels Fluctuations

Phosphorus Concentrations and Loadings

Area of Concern Sediment Contamination *(This component is not included in SOLEC. Information from reports of contaminated sediment remediation is collected by USEPA-GLNPO and is used by GLNPO to evaluate the contaminated sediment index component of this Index.)*

Benthic Health group of indicators:
- *Hexagenia*
- *Abundances of the Benthic Amphipod Diporeia spp.*

Contaminants in Sport Fish

Beach Advisories, Postings and Closures
- Drinking Water Quality

Atmospheric Deposition of Toxic Chemicals

Methods, Assumptions, and Suitability: The Index is based on a 40 point scale where the rating uses select Great Lakes State of the Lakes Ecosystem indicators (i.e., coastal wetlands, phosphorus concentrations, benthic health, fish tissue contamination, beach

closures, drinking water quality, and air toxics deposition), and an indicator for Area of Concern (AOC) sediment contamination. Each component of the Index is based on a 1 to 5 rating system, where 1 is poor and 5 is good. Authors use best professional judgment to assess the overall status of the ecosystem component in relation to established endpoints or ecosystem objectives, when available. The SOLEC indicators are also evaluated for Status (good, fair, poor, mixed) and Trend (improving, unchanging, deteriorating, undetermined). To calculate the Index, the data for each indicator are compared to the evaluation criteria for the numeric, 1 to 5, rating system. Each of the index components, other than the AOC sediment contamination component, is included in the broader suite of Great Lakes indicators, which was developed through an extensive multi-agency process to satisfy the overall criteria of necessary, sufficient and feasible. Information on the selection process is in the document, "Selection of Indicators for Great Lakes Basin Ecosystem Health, Version 4."

QA/QC Procedures: GLNPO has an approved Quality Management System in place[1](see reference #1 below) that conforms to the USEPA Quality Management Order and is audited every 3 years in accordance with Federal policy for Quality Management.

The SOLEC process relies on secondary use of data, i.e., data for many of the indicators are collected, maintained and analyzed by agencies and organizations other than USEPA. Participating agencies and organizations follow their own QA/QC procedures to assure high quality data. A Quality Assurance Project Plan (QAPP) was developed to document procedures for data assessment and review for the indicators reports prepared for the State of the Great Lakes 2005 report. See "State of the Lakes Ecosystem Conference 2004 QAPP." Contaminated sediment remediation information is collected in conformance with GLNPO's Great Lakes Sediment Remediation Project Summary Support QAPP[2] (see reference #2 below).

Data Quality Review: GLNPO's Quality Management System has been given "outstanding" evaluations in previous peer and management reviews[2] (see reference #2 below). GLNPO has implemented all recommendations from these external audits and complies with Agency Quality standards.

An external Peer Review of SOLEC processes and products was conducted in 2003 by an international panel of experts familiar with large-scale regional or national indicator and reporting systems. Panel findings were generally positive and several recommendations were made to consider for future SOLEC events and reports. Many of the recommendations have been implemented, and others are being considered for feasibility. The final report by the review panel is available online at http://epa.gov/glnpo/solec/index.html. See "State of the Lakes Ecosystem Conference Peer Review Report" in the SOLEC 2004 section.

A second review of the suite of Great Lakes indicators was conducted by Great Lakes stakeholders in 2004. As a direct result of the findings and recommendations from the participants, several indicators were revised, combined or dropped, and a few others were added. The indicators were also regrouped to allow the user to more easily identify the

indicators relevant to particular ecosystem components or environmental issues. The final report from the review is available online at http://epa.gov/glnpo/solec/index.html. See "State of the Lakes Ecosystem Conference Peer Review Report, Part 2: Stakeholder Review of the Great Lakes Indicators" in the SOLEC 2004 section.

Data Limitations: Data limitations vary among the indicator components of the Index. The data are especially good for phosphorus concentrations, fish tissue contamination, benthic health, and air toxics deposition. The data associated with other components of the index (coastal wetlands, AOC sediment contamination, beach closures, and drinking water quality) are more qualitative. Some data are distributed among several sources, and without an extensive trend line. Limitations for each of the index components are included in the formal indicator descriptions in the document, "The Great Lakes Indicator Suite: Changes and Progress 2004." The data provided in the sediment tracking database should be used as a tool to track sediment remediation progress at sites across the Great Lakes. Many of the totals for sediment remediation are estimates provided by project managers. For specific data uses, individual project managers should be contacted to provide additional information.

Error Estimate: Error statistics for the Great Lakes Index have not been quantified. Each unit of the 40 point scale represents 2.5% of the total, so any unit change in the assessment of one of the component indicators would result in a change of the index of that magnitude. The degree of environmental change required to affect an indicator assessment, however, may be significantly large.

New/Improved Data or Systems: Data continue to be collected by various agencies, including GLNPO. Efforts are currently in progress to integrate various Great Lakes monitoring programs to better meet SOLEC objectives and to increase efficiencies in data collection and reporting. Documentation regarding SOLEC is available on the Internet and from GLNPO[4] (see reference # 4 below).

References:

1. "Quality Management Plan for the Great Lakes National Program Office." EPA905-R-02-009. Revised and approved May 2008. http://www.epa.gov/glnpo/qmp/

2. Quality Assurance Project Plan for "Great Lakes Sediment Remediation Project Summary Support." Unpublished – in Great Lakes National Program Office files, June 2008.

3. "GLNPO Management Systems Review of 2006." Unpublished - in USEPA Great Lakes National Program Office files.

4. a. "State of the Lakes Ecosystem Conference 2004 QAPP." Unpublished. Prepared as part of Cooperative Agreement between USEPA and Environment Canada.

   b. Canada and the United States. "State of the Great Lakes 2003." ISBN 0-662-34798-6, Environment Canada, Burlington, Ontario, Cat. No. En40-11/35-2003E, and

U.S.

c. Environmental Protection Agency, Chicago, EPA 905-R-03-004. 2003. Available on CD and online at <www.binational.net>.

d. Canada and the United States. "Implementing Indicators 2003 - A Technical Report." ISBN 0-662-34797-8 (CD-Rom), Environment Canada, Burlington, Ontario, Cat. No. En164-1/2003E-MRC (CD-Rom), and U.S. Environmental Protection Agency, Chicago, EPA 905-R-03-003. 2003. Available on CD from U.S. EPA/Great Lakes National Program Office, Chicago. Available online at http://epa.gov/glnpo/solec/index.html

e. Canada and the United States. "State of the Great Lakes 2005." Environment Canada, Burlington, Ontario(Cat No. En161-3/0-2005E-PDF) and U.S. Environmental Protection Agency, Chicago (EPA 905-R-06-001), 2006 Available online at <http://epa.gov/glnpo/solec/index.html>

f. Bertram, Paul and Nancy Stadler-Salt. "Selection of Indicators for Great Lakes Basin Ecosystem Health, Version 4." Environment Canada, Burlington, Ontario, and U.S. EPA, Chicago. 2000. Available online at <www.binational.net>.

g. Forst, Christina, Paul Bertram and Nancy Stadler-Salt. 2004. The Great Lakes Indicator Suite: Changes and Progress at SOLEC 2004. Available online at http://binational.net/solec/English/SOLEC%202004/Tagged%20PDFs/Changes_and_Progress_Paper_(FULL).pdf

h. Canada and the United States. "State of the Great Lakes 2007 Highlights," Environment Canada, Burlington, Ontario (Cat. No. En161-3/2007E) and U.S. Environmental Protection Agency, Chicago (EPA 905-R-07-002) 2007. Available online at http://binational.net/solec/English/sogl2007highlights_en.pdf.

i. Canada and the United States. "State of the Great Lakes 2009," Environment Canada, Burlington, Ontario (Cat. No. En161-3/1-2009E-PDF) and U.S. Environmental Protection Agency, Chicago (EPA-905-R-09-031) 2009. Available online at http://binational.net/solec/sogl2009_e.html.

All SOLEC documents, background reports, indicator reports, indicator development processes, conference agenda, proceedings and presentations are available online at http://epa.gov/glnpo/solec/index.html . The documents are sorted by SOLEC year and include the State of the Great Lakes reports which are released the following calendar year.

FY 2011 Performance Measures:

- **Percent of goal achieved for implementing nitrogen reduction practices to reduce nitrogen 162.5 million lbs from 1985 levels to achieve a 175 million**

lb/yr cap load, based on long-term average hydrology simulations (program assessment measure-Chesapeake Bay Program)

- **Percent of goal achieved for implementing phosphorus reduction practices to reduce phosphorus 14.36 million lbs from 1985 levels to achieve a 12.8 million lb/yr cap load, based on long-term average hydrology simulations (program assessment measure-Chesapeake Bay Program)**
- **Percent of goal achieved for implementing sediment reduction practices to reduce sediment 1.69 million tons from 1985 levels to achieve a 4.15 million ton/yr cap load, based on long-term average hydrology simulations (program assessment measure-Chesapeake Bay Program)**
- **Total nitrogen reduction practices implementation achieved as a result of agricultural best management practice implementation per million dollars to implement agricultural BMPs (program assessment efficiency measure)**

Performance Database: Reducing Pollution Summary (Controlling Nitrogen, Phosphorus and Sediment.) Implementation of point & nonpoint source nitrogen and phosphorus reduction practices throughout the Bay watershed, expressed as % of reduction goal achieved. The nitrogen goal is a 162.5 million pound reduction from FY 1986 levels to achieve an annual cap load of 175 million lbs (based on long-term average hydrology simulations). The phosphorus goal is a 14.36 million pound reduction from FY1986 levels to achieve an annual cap load of 12.8 million lbs (based on long-term average hydrology simulations). Achieving the cap loads is expected to result in achievement of the long-term restoration goals for submerged aquatic vegetation and dissolved oxygen. Point source loads are monitored or estimated based on expert evaluation of treatment processes. Nonpoint source loads are simulated based on reported implementation of best management practices (BMPs) that reduce nitrogen and phosphorus pollution. The simulation removes annual hydrological variations in order to measure the effectiveness of BMP implementation and converts the numerous BMPs, with various pollution reduction efficiencies – depending on type and location in the watershed – to a common currency of nitrogen and phosphorus reduction.

Implementation of sediment reduction practices throughout the Bay watershed, expressed as % of land-based sediment reduction goal achieved. The sediment reduction goal is a 1.69 million ton reduction from FY 1986 levels to achieve an annual cap load of 4.15 million tons (based on average hydrology simulations). Achieving this cap load is expected to result in achievement of the long-term restoration goals for submerged aquatic vegetation and dissolved oxygen. Loads are simulated based upon reported implementation of best management practices (BMPs) that reduce sediment pollution. The simulation removes annual hydrological variations in order to measure the effectiveness of BMP implementation and converts the numerous BMPs, with various pollution reduction efficiencies – depending on type and location in the watershed – to a common currency of sediment reduction.

Agricultural BMP costs include all capital and O&M costs assumed by both landowners and government agencies. This measure focuses on agricultural BMPs because they are the most cost effective way to reduce nutrient loading in the watershed.

The Bay data files used in the indicator are located at http://archive.chesapeakebay.net/status/status08/reducingpollution2008.xls. Data have been reported for calendar years 1985, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008 and are expected on an annual basis after 2008. Data are from Chesapeake Bay watershed portions of NY, MD, PA, VA, WV, DE, and DC.

The FY 2011 Annual Performance Report for these measures will be based on the results of the 2010 data collection. We expect to receive the preliminary results for 2010 in March 2011.

The description of the data and the methods used to interpret, analyze and quality assure the data are available at http://archive.chesapeakebay.net/status/status08/reducingpollution2008.doc.

Data Source: Annual jurisdictional submissions of both monitored and estimated point source effluent concentrations and flows approved by each jurisdiction as well as nonpoint source practice data tracked by jurisdictions and reported to the Chesapeake Bay Program office. For point source data, refer to http://www.chesapeakebay.net/data_pointsource.aspx. Summary nonpoint source practice implementation data with comparisons to Tributary Strategy levels can be found at http://www.chesapeakebay.net/tributarystrategy_tools.aspx. Summary loads and landuse acreage with comparisons to Tributary Strategy goals and cap load allocations can be found at http://www.chesapeakebay.net/tributarystrategy_tools.aspx. For detailed historic and current scenario loads as well as jurisdictional Tributary Strategies, refer to http://www.chesapeakebay.net/data_modeling.aspx.

Custodians of Source Data:

- Wastewater: Ning Zhou, Point Source Data Manager, Virginia Polytechnic Institute and State University, Chesapeake Bay Program Office
- Nonpoint Source practices and Watershed Model information: Jeff Sweeney, Nonpoint Source Data Manager, University of Maryland, Chesapeake Bay Program Office

Agricultural practice costs used in the program assessment efficiency measure are in the guidance document "Technical Support Document for Identification of Chesapeake Bay Designated Uses and Attainability" (Technical Support Document) under "Part I: Documentation of Estimated Costs of the Tier Scenarios". Specific cost information for agricultural practices begins on page 36 and a summary table of unit BMP costs is on page 70 of hard copy document.

Methods, Assumptions and Suitability: The Chesapeake Bay Program Phase 4.3 Watershed Model is the tool used to transform calculated point source discharge loads (generally, from monitored flow and concentration data) to nutrient loads delivered to Chesapeake Bay tidal waters, which the indicator is based on.

The Phase 4.3 Watershed Model is also employed to integrate the nonpoint source practice implementation data – submitted by jurisdictions for a host of practices and programs – to changes in delivered nutrient and sediment loads as well as to assimilate the impacts of both point and nonpoint source controls and practices for the Reducing Pollution Summary.

A wealth of both general and technical documents about the Chesapeake Bay Program Watershed Model can be found on the Bay Program's web site. These documents can accessed through the Modeling Subcommittee's site http://www.chesapeakebay.net/committee_msc_info.aspx under the links "Current Projects" and "Publications".

The Phase 4.3 Watershed Model is calibrated to long-term monitoring data at 26 calibration sites throughout the basin with edge-of-stream land use calibrations for 9 land categories. For direct comparisons of monitoring and modeled data for the 1985-1994 simulation period, see "CBP Watershed Model – Phase 4.3 Calibration" at http://archive.chesapeakebay.net/temporary/mdsc/index.htm

Of particular significance are the in-stream calibration plots for flows and total nitrogen and total phosphorus loads at the Susquehanna and Potomac fall-lines because of the basins' considerable impact on dissolved oxygen in the mainstem of the Chesapeake Bay. For an understanding of the Phase 4.3 Watershed Model calibration rules, see http://archive.chesapeakebay.net/temporary/mdsc/calibration_0700.pdf

The Watershed Model allows scientists to simulate changes in physical, chemical, and biological processes in a large and complex ecosystem due to changes in human and animal populations, land uses, or pollution management, so that technically sound environmental decisions can be made. Monitoring data provides observations in the past or the present, at discrete times, and at isolated locations while modeling scenarios can be used to represent the environment under different management regimes in different temporal and spatial scales.

The Tributary Strategy goals for the Reducing Pollution indicators represent this "what-if" management regime, providing comparisons among historic and current watershed conditions and a future condition that would restore water quality and living resources in the Chesapeake Bay. So that the comparisons are relevant, reported nonpoint source loads from the Watershed Model are estimates of what would occur in an average hydrology year with a single year's watershed conditions (i.e., land uses, animal manure and chemical fertilizer inputs, human population, BMPs, septic, and atmospheric deposition). Point source loads reflect measured discharges from tracked waste treatment and industrial facilities, using the model to account for changes in nutrients as the pollutants move downstream.

For procedures of calculating point source discharges from data received from jurisdictions, refer to the following:

- "Chesapeake Bay Watershed Model Application & Calculation of Nutrient & Sediment Loadings - Appendix F: Phase IV Chesapeake Bay Watershed Model Point Source Loads" at http://www.chesapeakebay.net/pubs/114.pdf
- Quality Assurance Project Plan (QAPP) "Standard Operating Procedures for Managing Point Source Data – Chesapeake Bay Program" on file for the EPA grant (contact: Quality Assurance Coordinator, Mary Ellen Ley, mley@chesapeakebay.net).

For data acquisition and management of nonpoint source data received from jurisdictions, refer to:

- Quality Assurance Project Plan (QAPP) "Standard Operating Procedures for Managing Nonpoint Source Data – Chesapeake Bay Program" on file for the EPA grant (contact: Quality Assurance Coordinator, Mary Ellen Ley, mley@chesapeakebay.net).

In developing the Reducing Pollution indicators, comparisons are made within relevant source sectors and among relevant years and goals for nutrient and sediment loads delivered to tidal waters – as estimated by the Chesapeake Bay Program Phase 4.3 Watershed Model. The Watershed Model is employed to integrate the nonpoint source practice implementation data – submitted by jurisdictions for a host of practices and programs –with changes in delivered nutrient and sediment loads. The model also assimilates the impacts of both point and nonpoint source controls and practices for the Reducing Pollution Summary.

The current status of a source indicator (e.g. WWTPs) is a comparison between the total load reductions from that source made between1985 and 2008 and the load reductions that need to be made, starting in 1985, to meet the state tributary strategies. For the summary *Reducing Pollution* indicator, the current status is a comparison of total load reductions made from all sources combined between 1985 and 2008 and the load reductions that need to be made starting in 1985 to meet the Bay Program's cap load allocations.

1985 is often used as the baseline and 2008 is the most recent annual model assessment of loads to the Bay. Tributary Strategy loads are the model's assimilation of jurisdictional clean-up plans submitted to the Bay Program office as of 6/22/07, the last date a jurisdictional revision was made. The Tributary Strategies are detailed plans of point and nonpoint source programs, practices and control technologies that, when combined, would meet the cap loads for nitrogen, phosphorus and sediment - as assessed by the Chesapeake Bay Program's Phase 4.3 Watershed Model. The cap load allocations were developed earlier and assigned to each jurisdictions' portion of the major tributaries of the Chesapeake Bay following a process documented in "Setting and Allocating the Chesapeake Bay Basin Nutrient and Sediment Loads: The Collaborative Process, Technical Tools and Innovative Approaches" at http://www.chesapeakebay.net/content/publications/cbp_19713.pdf There are no caps assigned to sources in the cap load allocations as there is source specificity in the jurisdictional Tributary Strategies.

It is important to note that nonpoint source load estimates depicted by the Watershed Model are based on an average-hydrology year and would not track monitored loads for that particular year. Point source loads reflect measured discharges for each particular year, or the best estimates where data is lacking.

QA/QC Procedures: Procedures for compiling and managing point source discharge data at the Chesapeake Bay Program office are documented in the following EPA-approved Quality Assurance Project Plan:

- "Standard Operating Procedures for Managing Point Source Data – Chesapeake Bay Program" on file for the EPA grant (contact: Quality Assurance Coordinator, Mary Ellen Ley, mley@chesapeakebay.net).

Procedures for acquiring and managing nonpoint source data at the Chesapeake Bay Program office are documented in the following EPA-approved Quality Assurance Project Plan:
"Standard Operating Procedures for Managing Nonpoint Source Data – Chesapeake Bay Program" on file for the EPA grant (contact: Quality Assurance Coordinator, Mary Ellen Ley, mley@chesapeakebay.net).

Data Quality Reviews: The Reducing Pollution indicators have undergone technical and peer review by federal, state and local government and nongovernmental organization partner members of the Bay Program network. Data selection and interpretation and the presentation of the indicator (along with all supporting information and conclusions) are arrived at via consensus of scientists and resource managers of the Bay Program Tributary Strategy Workgroup, Wastewater Treatment Workgroup, and Urban Stormwater Workgroup. Data collection, data analysis and QA/QC is conducted by the custodians of the source data.

Jurisdictions providing point source effluent data and nonpoint source BMP data to the Bay Program office have supplied documentation of their quality assurance and quality control policies, procedures, and specifications in the form of Quality Assurance Management Plans and Quality Assurance Project Plans. Jurisdictional documentation can be obtained by contacting the Quality Assurance Coordinator, Mary Ellen Ley, mley@chesapeakebay.net).

Data and methods used in the Watershed Model as well as the simulation itself and loading outputs are continually under external and internal review. Internal review mostly involves Bay Program subcommittees and their workgroups such as the Nutrient Subcommittee (Tributary Strategy Workgroup, Wastewater Treatment Workgroup, Agricultural Nutrient and Sediment Reduction Workgroup, Urban Stormwater Workgroup, Forestry Workgroup, and Sediment Workgroup); the Modeling Subcommittee; and special task groups established particularly for peer review. Scopes and purposes of these groups and their extensive considerations of the Watershed Model as a planning tool can be found at http://www.chesapeakebay.net/nsc.htm (Nutrient

Subcommittee and workgroups) and at http://www.chesapeakebay.net/modsc.htm (Modeling Subcommittee).

The most recent review of the Bay Program's watershed modeling effort by an independent panel of experts was completed February, 2008. An external panel assembled by the Scientific and Technical Advisory Committee reviewed the Chesapeake Bay Watershed Model assessing (1) work to date, (2) the model's suitability for making management decisions at the Bay Watershed and local scales, and (3) potential enhancements to improve the predictive ability of the next generation of the Chesapeake Bay Watershed Models. A report of the review, with specific recommendations, can be found at the STAC site http://www.chesapeake.org/stac/stacpubs.html

Another review of Bay Program modeling efforts "Modeling in the Chesapeake Bay Program: 2010 and Beyond" completed January, 2006 is published by STAC at http://www.chesapeake.org/stac/Pubs/ModBay2010Report.pdf

In June, 2005, another review of the Watershed Model addressed the following broad questions: 1) Does the current phase of the model use the most appropriate protocols for simulation of watershed processes and management impacts, based on the current state of the art in the HSPF model development?, and 2) Looking forward to the future refinement of the model, where should the Bay Program look to increase the utility of the watershed model? Details of this review and responses can be found at http://www.chesapeakebay.net/pubs/subcommittee/mdsc/Watershed_Model_Peer_Review.pdf

Data Limitations: Nonpoint source BMP implementation data were not reported consistently and for all watershed jurisdictions for the period 1986-1999. Therefore, the 1986-1999 nonpoint source levels are a linear progression between the 1985 baseline and the year 2000.

Error Estimate: There may be errors in classification, georeferencing, and documentation, mistakes in the processing of data or data omissions.

New/Improved Data or Systems: The next version of the watershed model is currently under development and will be used for development of the Bay TMDL. The new version (phase 5) has increased spatial resolution and ability to model the effects of management practices. The phase 5 watershed model is a joint project with cooperating state and Federal agencies. Contact Gary Shenk at gshenk@chesapeakebay.net or see the web site at
http://www.chesapeakebay.net/phase5.htm

References:

- See http://www.chesapeakebay.net/data/index.htm, refer to CBP Watershed Model Scenario Output Database, Phase 4.3. Contact Jeff Sweeney jsweeney@chesapeakebay.net

- Reducing Pollution Summary (Controlling Nitrogen, Phosphorus and Sediment) indicators are published at http://www.chesapeakebay.net/status_reducingpollution.aspx

FY 2011 Performance Measures:

- **Percent of point source nitrogen reduction goal of 49.9 million pounds achieved (program assessment measure-Chesapeake Bay Program)**
- **Percent of point source phosphorus reduction goal of 6.16 million pounds achieved (program assessment measure-Chesapeake Bay Program)**

Performance Database: Point source nitrogen and phosphorus reductions are reported as % of goal achieved and pounds. The goal for point source nitrogen reductions is 49.9 million pound reduction from FY 1986 levels. The goal for point source phosphorus reductions is 6.16 million pound reduction from FY 1986 levels. Point source nitrogen and phosphorus data is reported based upon monitored results from the previous calendar year.

The Bay data files used in the indicator are located at http://archive.chesapeakebay.net/status/status08/wastewater2008.xls. Data have been collected 1985-2008 and are expected on an annual basis after 2008.

The FY 2011 Annual Performance Report for these measures will be based on the results of the 2010 data collection. We expect to receive the preliminary results for 2010 in March 2011.

The description of the data and the methods used to interpret, analyze and quality assure the data are available at http://archive.chesapeakebay.net/status/status08/wastewater2008.doc.

Data Source: Annual jurisdictional submissions of both monitored and estimated point source effluent concentrations and flows approved by each jurisdiction as well as nonpoint source practice data tracked by jurisdictions and reported to the Chesapeake Bay Program office. For point source data, refer to http://www.chesapeakebay.net/data_pointsource.aspx.
Custodian of Source Data: Wastewater: Ning Zhou, Point Source Data Manager, Virginia Polytechnic Institute and State University, Chesapeake Bay Program Office

Methods, Assumptions and Suitability: For procedures of calculating point source discharges from data received from jurisdictions, refer to the following:

- "Chesapeake Bay Watershed Model Application & Calculation of Nutrient & Sediment Loadings - Appendix F: Phase IV Chesapeake Bay Watershed Model Point Source Loads" at http://www.chesapeakebay.net/pubs/114.pdf
- Quality Assurance Project Plan (QAPP) "Standard Operating Procedures for Managing Point Source Data – Chesapeake Bay Program" on file for the EPA

grant (contact: Quality Assurance Coordinator, Mary Ellen Ley, mley@chesapeakebay.net).

Monitored discharge data were generated from the EPA-approved standard sampling and analysis methods and documented in the Data Monthly Reports from facilities to jurisdictions.

Discharge data back to the earlier years of the record are inadequate for many regions in the Bay watershed; however, the 1985 baseline is consistent throughout the indicator record.

Facilities have been added to the point source database over the years, not necessarily because they physically went on line, but because they were previously untracked. In addition, facilities have been turned inactive in the point source database over time because they went off line or combined with other facilities as new plants.

Protocols of calculating discharges from measured or estimated flows and effluent concentrations have been adjusted throughout the data record to better reflect actual end-of-pipe loads.

Jurisdictional Tributary Strategies may not be final so the goals could be adjusted in the future as jurisdictions update implementation plans that better reflect projected point source discharges.

Point source data sets from seven jurisdictions are merged at the Chesapeake Bay Program office. Continual peer-review of the thoroughness of discharge data and methods of managing the information by the Wastewater Treatment Workgroup promotes consistency and completeness of calculated end-of-pipe loads among the jurisdictions.

Point source indicator goals are rooted in projected discharge flows for the year 2010 or facility capacity flows as established by individual jurisdictions or under forecasting protocols of the Bay Program Wastewater Treatment Workgroup.

QA/QC Procedures: Procedures for compiling and managing point source discharge data at the Chesapeake Bay Program office are documented in the following EPA-approved Quality Assurance Project Plan:

- "Standard Operating Procedures for Managing Point Source Data – Chesapeake Bay Program" on file for the EPA grant (contact: Quality Assurance Coordinator, Mary Ellen Ley, mley@chesapeakebay.net).

Data Quality Reviews: The indicators have undergone technical and peer review by federal, state and local government and nongovernmental organization partner members of the Bay Program network. Data selection and interpretation and the presentation of the indicator (along with all supporting information and conclusions) are arrived at via consensus of scientists and resource managers of the Bay Program Wastewater Treatment

Workgroup. Data collection, data analysis and QA/QC are conducted by the custodians of the source data.

Jurisdictions providing point source effluent data and nonpoint source BMP data to the Bay Program office have supplied documentation of their quality assurance and quality control policies, procedures, and specifications in the form of Quality Assurance Management Plans and Quality Assurance Project Plans. Jurisdictional documentation can be obtained by contacting the Quality Assurance Coordinator, Mary Ellen Ley, mley@chesapeakebay.net).

Data Limitations: Peer-reviewed methods are employed to estimate point source discharges where all needed measured data is not available. Refer to:

- "Chesapeake Bay Watershed Model Application & Calculation of Nutrient & Sediment Loadings - Appendix F: Phase IV Chesapeake Bay Watershed Model Point Source Loads" at http://www.chesapeakebay.net/pubs/114.pdf

Quality Assurance Project Plan (QAPP) "Standard Operating Procedures for Managing Point Source Data – Chesapeake Bay Program" on file for the EPA grant (contact: Quality Assurance Coordinator, Mary Ellen Ley, mley@chesapeakebay.net).

Error Estimate: The CBP tries to trace significant variability in the data and limit its impact.

New/Improved Data or Systems: N/A

References:
The Wastewater Pollution Controls indicator is published at
http://www.chesapeakebay.net/status_wastewater.aspx?menuitem=19692

<u>FY 2011 Performance Measure:</u>

- **Percent of forest buffer planting goal of 10,000 miles achieved (program assessment measure-Chesapeake Bay Program)**

Performance Database: Forest buffer planting is reported as % of goal achieved. The long term goal is to plant 10,000 miles of forest buffers. The information is based on cumulative acres planted since FY 1997 provided by the states for the previous calendar year.

The Bay data files used in the indicator are located at
http://archive.chesapeakebay.net/status/status08/forestbuffers2008.xls. Data have been collected 1996-2008 and are expected on an annual basis after 2008.

The FY 2011 Annual Performance Report for these measures will be based on the results of the 2010 data collection. We expect to receive the preliminary results for 2010 in March 2011.

The description of the data and the methods used to interpret, analyze and quality assure the data are available at
http://archive.chesapeakebay.net/status/status08/forestbuffers2008.doc.

Data Source: Sampling design is formulated by the USDA for tracking projects and funds. Data and metadata are sent to the Forestry Work Group (state-level Departments of Forestry) by participating state coordinators and field personnel. Geographic Information System maps are produced by the UMD Center for Environmental Science. Contacts: Judy Okay, jokay@chesapeakebay.net

Methods, Assumptions and Suitability: Data collected for tracking linear ft, miles, and acres of forest buffers are measured directly. State data are merged to get cumulative miles. Submission criteria have been set and agreed to by State agencies. The data are summarized in a spreadsheet by geographic location with related extent of project sites. A Geographic Information System (GIS) is used to help generate the indicator data.

Data Quality Reviews: The data are collected by state field personnel and submitted to the state-level Departments of Forestry for QA/QC checks.

Data Limitations: The data are only as good as the data originally submitted by the states. This information passes through many hands before being merged into the annual cumulative miles. Human error enters into this type of record. The data are compiled and released with utmost attention to accuracy and validation of locations and extents of riparian forest buffers.

Error Estimate: none calculated.

New/Improved Data or Systems: N/A

References:
The Riparian Forest Buffers Planted indicator is published at
http://www.chesapeakebay.net/status_forestbuffers.aspx?menuitem=19723

The description of the data and the methods used to interpret, analyze and quality assure the data are available at
http://archive.chesapeakebay.net/status/status08/forestbuffers2008.doc.

<u>FY 2011 Performance Measures:</u>

- **Percent of Submerged Aquatic Vegetation goal of 185,000 acres achieved, based on annual monitoring from prior year.**

Performance Database: Acres of Submerged Aquatic Vegetation in Chesapeake Bay is reported as % of goal achieved. The long term goal is 185,000 acres, which represents

approximate historic abundance from the 1930s to present. The data are based on acreage measured in photographs during the annual aerial surveys (after photo-interpretation).

The Bay data files used in the indicator are located at http://archive.chesapeakebay.net/status/status08/baygrasses2008.xls. Data have been collected 1984-2009, excluding 1988 when no surveys were conducted, and are expected on an annual basis.

The FY 2011 Annual Performance Report for these measures will be based on the results of the 2010 data collection. We expect to receive the preliminary results for 2010 in March 2011.

The description of the data and the methods used to interpret, analyze and quality assure the data are available at http://archive.chesapeakebay.net/status/status08/baygrasses2008.doc.

Data Source: Virginia Institute of Marine Science via EPA Chesapeake Bay Program Office grant.

Methods, Assumptions and Suitability: Please refer to http://www.vims.edu/bio/sav/sav02/report/reportindex_page.html.

The SAV survey is a general monitoring program, conducted to optimize precision and accuracy in characterizing annually the status and trends of SAV in tidal portions of the Chesapeake Bay. The general plan is to follow fixed flight routes over shallow water areas of the Bay to comprehensively survey all tidal shallow water areas of the Bay and its tidal tributaries. Non-tidal areas are omitted from the survey. SAV beds less than 1 square meter are not included due to the limits of the photography and interpretation. Annual monitoring began in 1984 and is ongoing. See Chesapeake Bay SAV special reports at http://www.vims.edu/bio/sav/savreports.html and bibliography at http://www.vims.edu/bio/sav/savchespub.html.

Methods developed for this survey are described in "2002 Distribution of submerged aquatic vegetation in the Chesapeake Bay and coastal bays. R. J. Orth, D. J. Wilcox, L. S. Nagey, A. L. Owens, J. R. Whiting, and A. Serio. VIMS Special Scientific Report Number 139. Final report to U.S. EPA, Chesapeake Bay Program, Annapolis, MD. Grant No.CB983649-01-0, 2003." available at http://www.vims.edu/bio/sav/sav02/ .

Methods are also described in the Quality Assurance Project Plan (QAPP) on file for the EPA grant (contact: EPA grant project officer, Mike Fritz (fritz.mike@epa.gov) and at the VIMS web site (http://www.vims.edu/bio/sav/). See Chesapeake Bay SAV special reports at http://www.vims.edu/bio/sav/savreports.html and bibliography at http://www.vims.edu/bio/sav/savchespub.html. Metadata are included with the data set posted at the VIMS web site (http://www.vims.edu/bio/sav/metadata/recent.html).

QA/QC Procedures: Quality assurance project plan for the EPA grant to the Virginia Institute of Marine Sciences describes data collection, analysis, and management methods. This is on file at the U. S. Environmental Protection Agency Chesapeake Bay Program Office (contact: EPA grant project officer, Mike Fritz (fritz.mike@epa.gov). The VIMS web site at http://www.vims.edu/bio/sav/ provides this information as well. Metadata are included with the data set posted at the VIMS web site (http://www.vims.edu/bio/sav/metadata/recent.html).

Data Quality Reviews: This indicator has undergone extensive technical and peer review by state, Federal and non-government organization partner members of the SAV workgroup and the Living Resources subcommittee. Data collection, data analysis and QA/QC are conducted by the principal investigators/scientists. The data are peer reviewed by scientists on the workgroup. Data selection and interpretation, the presentation of the indicator, along with all supporting information and conclusions, are arrived at via consensus by the scientists in collaboration with the resource manager members of the workgroup. The workgroup presents the indicator to the subcommittee where extensive peer review by Bay Program managers occurs. See Chesapeake Bay SAV special reports at http://www.vims.edu/bio/sav/savreports.html and bibliography at http://www.vims.edu/bio/sav/savchespub.html. The SAV distribution data files are located at http://www.vims.edu/bio/sav/savdata.html. The SAV indicator is published at www.chesapeakebay.net/status_baygrasses.aspx.

Data Limitations: Due to funding constraints, there were no surveys in 1988. Spatial gaps in 1999 occurred due to hurricane disturbance and subsequent inability to reliably photograph SAV. Spatial gaps in 2001 occurred due to post-nine-eleven flight restrictions near Washington D.C. Spatial gaps in 2003 occurred due to adverse weather in the spring and summer and Hurricane Isabel in the fall. Estimates of acreage in the non-surveyed areas, based on prior year surveys, were developed for those years (1999, 2001, 2003).

Error Estimate: Values used in the analysis are aggregated data, aggregated by Chesapeake Bay segment. Please refer to http://www.vims.edu/bio/sav/sav03/report/calculation_sav_area_page.html and http://www.vims.edu/bio/sav/sav03/report/mapping_process_page.html for methods and tools.

New/Improved Data or Systems: Some technical improvements (e.g., photo-interpretation tools) were made over the 16 years of the annual SAV survey in Chesapeake Bay. Surveyors and analysts have carefully evaluated the effect of methodological changes along the way and made corrections to adjust for any known effects.

References:

- The indicator is published at http://www.chesapeakebay.net/status_baygrasses.aspx.

- See Chesapeake Bay SAV special reports at http://www.vims.edu/bio/sav/savreports.html and bibliography at http://www.vims.edu/bio/sav/savchespub.html.

FY 2011 Performance Measures:

- **Percent of Dissolved Oxygen goal of 100% standards attainment achieved, based on annual monitoring from the previous calendar year and the preceding 2 years.**

Performance Database: Dissolved oxygen (DO) water quality standards attainment is reported as % of goal achieved. The long term goal is standards attainment in all tidal segments of the Chesapeake Bay.

State water quality standards have been adopted to reflect the dissolved oxygen needs of the Bay's aquatic life. The standards vary with water depth, season and duration of exposure. To meet state regulations, all data gathered within each tidal river and mainstem Bay segment must meet required dissolved oxygen concentrations, based on a combination of interpolation and cumulative frequency distribution (CFD) analyses. These analyses allow for some temporal and spatial exceedences of dissolved oxygen criteria. But if the segment has concentrations that exceed the permitted spatial and temporal allowances, the entire volume of water for that segment is considered out of attainment.

The Bay data files used in the indicator are located at http://archive.chesapeakebay.net/status/status08/dissolvedoxygen2008.xls. Data have been collected 1985-2009 and are expected on an annual basis.

The FY 2011 Annual Performance Report for these measures will be based on the assessment of the 2008-2010 data collection. We expect to receive the preliminary results for the 2008-2010 assessment period in March 2011.

The description of the data and the methods used to interpret, analyze and quality assure the data are available at http://archive.chesapeakebay.net/status/status08/dissolvedoxygen2008.doc.

Data Source: DO is measured by the MD Department of Natural Resources (MD mainstem and tributary data), the VA Department of Environmental Quality (VA tributary data and benthic monitoring data), Old Dominion University (VA mainstem data), Virginia Institute of Marine Sciences (VA data), and Alliance for the Chesapeake Bay (volunteer monitoring program in VA).

Data included in standard monitoring programs are located on the CIMS data hub. These data can be downloaded from the Chesapeake Bay Program website

(http://www.chesapeakebay.net/wquality.htm) by selecting the "data" tab and subsequently the "CBP Water Quality Database (1984-present)" for dissolved oxygen data. Additional data submitted by the states from non-standard monitoring programs can be obtained by contacting Jeni Keisman (UMCES/CBPO) at JKeisman@chesapeakebay.net.

Methods, Assumptions and Suitability: Standards attainment assessment is based on DO concentrations measured in-situ at surface and depth profiles at fixed stations in the entire Bay. Raw data are processed by the Bay Program's interpolator program and, subsequently, interpolations are analyzed by a fortran program on a linux platform to determine the volumetric extent of compliance. Methods are described in the Quality Assurance Project Plan (QAPP) on file for the EPA grant. Documentation is available at: http://www.chesapeakebay.net/qatidal.htm.

QA/QC Procedures: The Quality Assurance Project Plan (QAPP) is on file for the EPA grant. Documentation is available at: http://www.chesapeakebay.net/qatidal.htm.

Data Quality Reviews: This indicator has undergone technical and peer review by state, Federal and non-government organization partner members of the Tidal Monitoring and Analysis Workgroup (TMAW) and the Monitoring and Assessment Subcommittee (MASC). Data collection, data analysis and QA/QC are conducted by the principal investigators/scientists. The data are peer reviewed by scientists in the workgroup. Data selection and interpretation, the presentation of the indicator, along with all supporting information and conclusions, are arrived at via consensus by the scientists in collaboration with the resource manager members of the workgroup. The workgroup presents the indicator to the subcommittee where extensive peer review by Bay Program managers occurs. The dissolved oxygen indicator is published at http://www.chesapeakebay.net/status_dissolvedoxygen.aspx.

Data Limitations: Since 2003, we have included monitoring data provided by the states that were gathered by additional programs beyond the long-term fixed station monitoring program in place since 1985. Similar data did not exist prior to 2003, so it is not included for analyses going back to 1985. Therefore, caution should be exercised when attempting to extrapolate trends from the 1985-2007 results as the sampling regime is not consistent for the entire time period. Specifically, additional data is included in analyses from 2003 to present.

Error Estimate: DO data are aggregated to 78 tidal water segments for the Chesapeake Bay (2003 revised Chesapeake Bay Program (CBP) segmentation and zonation scheme) and then aggregated to the baywide scale. Dissolved oxygen is variable both spatially and temporally. The interpolation program used to determine the spatial variability has inherent errors that add to the uncertainty of estimating DO concentrations in large areas of the Bay. Moreover, the interpolations have inherent errors in that they are a composite of monthly data and the sampling of different parts of the Bay occurs over different times of the month. Therefore, there are limitations to how the data can be applied and

interpreted both spatially and temporally. Documentation is available at: http://www.chesapeakebay.net/qatidal.htm.

New/Improved Data or Systems: There are DO criteria and standards attainment assessment methods for the Chesapeake Bay that have been developed and published for this indicator (refer to references, below). They are under constant review and have been revised and updated on an ongoing basis.

References:
The indicator is published at
http://www.chesapeakebay.net/status_dissolvedoxygen.aspx.

Chesapeake Bay Specific Water Quality Criteria documentation

- U.S. Environmental Protection Agency. 2003. *Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll a for the Chesapeake Bay and Its Tidal Tributaries.* EPA 903-R-03-002. Region III Chesapeake Bay Program Office, Annapolis, Maryland. http://www.chesapeakebay.net/publication.aspx?publicationid=13142

- U.S. Environmental Protection Agency. 2004. *Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll a for the Chesapeake Bay and Its Tidal Tributaries–2004 Addendum*. EPA 903-R-04-005. Region III Chesapeake Bay Program Office, Annapolis, Maryland. http://www.chesapeakebay.net/content/publications/cbp_13268.pdf

- U.S. Environmental Protection Agency. 2007. *Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll a for the Chesapeake Bay and Its Tidal Tributaries–2007 Addendum*. EPA 903-R-07-003. CBP/TRS 285-07. Region III Chesapeake Bay Program Office, Annapolis, Maryland. http://www.chesapeakebay.net/content/publications/cbp_27849.pdf

- U.S. Environmental Protection Agency. 2007. *Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll a for the Chesapeake Bay and Its Tidal Tributaries–2007 Chlorophyll a Criteria Addendum*. EPA 903-R-07-005. CBP/TRS 288-07. Region III Chesapeake Bay Program Office, Annapolis, Maryland http://www.chesapeakebay.net/content/publications/cbp_20138.pdf

- U.S. Environmental Protection Agency. 2008. *Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll a for the Chesapeake Bay and Its Tidal Tributaries–2008 Technical Support for Criteria Assessment Protocols Addendum*. EPA 903-R-08-001. CBP/TRS 290-08. Region III Chesapeake Bay Program Office, Annapolis, Maryland.

- U. S. Environmental Protection Agency. 2003. Biological Evaluation for the Issuance of Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity

and Chlorophyll a for the Chesapeake Bay and its Tidal Tributaries. Region III Chesapeake Bay Program Office, Annapolis, Maryland. http://www.chesapeakebay.net/content/publications/cbp_28935.pdf

- National Marine Fisheries Service. 2003. *National Marine Fisheries Service Endangered Species Act Biological Opinion--Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll a for the Chesapeake Bay and Its Tidal Tributaries–2007 Chlorophyll a Criteria Addendum*. F/NER/2003/00961. National Marine Fisheries Service, Northeast Region, Gloucester, Massachusetts.

- Olson, M. 2009. *Relative Status Indicators: Development and Evolution of a Relative Measure of Condition for Assessing the Status of Water Quality and Biological Parameters Tracked in the US/EPA Chesapeake Bay Program Long Term Monitoring Programs—Final Report.* The Interstate Commission for the Potomac River Basin, Rockville, Maryland. http://www.potomacriver.org/cms/publicationspdf/ICPRB09-4.pdf

Chesapeake Bay Tidal Water Designated Uses/Use Attainability Analyses

- U.S. Environmental Protection Agency. 2003. *Technical Support Document for Identification of Chesapeake Bay Designated Uses and Attainability.* EPA 903-R-03-004. Region III Chesapeake Bay Program Office, Annapolis, Maryland. http://www.chesapeakebay.net/publication.aspx?publicationid=13218

- U.S. Environmental Protection Agency. 2004. *Technical Support Document for Identification of Chesapeake Bay Designated Uses and Attainability–2004 Addendum.* EPA 903-R-04-006. Region III Chesapeake Bay Program Office, Annapolis, Maryland. http://www.chesapeakebay.net/content/publications/cbp_13270.pdf

- Chesapeake Bay Program. 2004. *Chesapeake Bay Program Analytical Segmentation Schemes: Revision, decisions and rationales, 1983-2003.* EPA 903-R-04-008. CBP/TRS 268/04. Chesapeake Bay Program Office, Annapolis, Maryland. http://www.chesapeakebay.net/publication.aspx?publicationid=13272

- Chesapeake Bay Program. 2005. *Chesapeake Bay Program Analytical Segmentation Schemes: Revision, decisions and rationales, 1983-2003—2005 Addendum.* EPA 903-R-05-004. CBP/TRS 278/06. Chesapeake Bay Program Office, Annapolis, Maryland. http://www.chesapeakebay.net/content/publications/cbp_13378.pdf

- Moore, K.A., R.J. Orth and D.J. Wilcox. (2009). Assessment of the Abundance of Submersed Aquatic Vegetation (SAV) Communities in the Chesapeake Bay and Its Use in SAV Management. In: Remote Sensing and Geospatial Technologies for Coastal Ecosystems Assessment and Management, Lecture Notes in Geoinformation and Cartography, (Xiaojun Yang, ed). Springer-Verlag Berlin

Heidelberg. pp. 233-357.
http://www.springer.com/geography/gis+cartography/book/978-3-540-88182-7

FY 2011 Performance Measure:

- **Restore water and habitat quality to meet water quality standards in impaired segments in 13 priority areas (cumulative starting in FY 07)**

Performance Database: EPA's "Surf Your Watershed" and EPA's WATERS Expert Query Tool

Data Source: Data regarding impaired segments are from EPA's "Surf Your Watershed" and EPA's WATERS Expert Query Tool updated every two years when states submit their 303(d) reports on the status of impaired water segments as required in the Clean Water Act (CWA) 305(b) report. Another source of data is the EPA-approved Decision Documents, the Quality Assurance Project Plan (QAPP) for state 303(d) data.

Methods, Assumptions and Suitability: To begin, the Decision Documents for each Gulf State are acquired. The water bodies listed as impaired for Florida, Alabama, and Mississippi are compared to "Surf Your Watershed" and then to the WATERS Expert Query Tool. Louisiana and Texas have a different form for their Decision Documents, which include only delisted water bodies. For these two states only "Surf Your Watershed" and WATERS Expert Query Tool are used. All the data are cross referenced for discrepancies. Then, tables are created for each watershed in the Gulf of Mexico Program's Priority Watershed Inventory. In all, 67 tables are created. These tables include a segment identification number for viewing the water segment on a map, a link to the URL for "Surf Your Watershed", name of the state basin the segment is located, the watershed the segment is located, the name of the waterbody, the number and type of impairment for that segment, and the year the impairment is listed. Delisting information is also listed in the tables for segments that have that information. The information available for delisting includes the segment identification number, the waterbody name, what impairment was delisted, the basis for the delisting, and a link to the total maximum daily load (TMDL) document if it exists. Segments that are shared among two or more watersheds are highlighted for easier recognition when counting the number of segments duplicated among watersheds.

Shapefiles are acquired from the states that contain the 303(d) (e.g., impaired) segments for that state. The segments listed in the state shapefile, however, do not always match EPA's ("Surf Your Watershed", WATERS Expert Query Tool, and Decision Documents). Therefore, it is sometimes necessary to contact the state for additional shapefiles that contain missing segments. The data are grouped by watershed with a name to represent the area in the shapefile (ex. 2002_03170009_303d_line). New fields are added to the shapefile such as segment identification number (matches the number from the tables), TMDL status ("Impaired Water Segment," "TMDL Completed," "Restored"), number of impairments for that segment, list of impairments for that

segment, and the waterbody name for that segment. Maps are then generated to show the number of impairments in each watershed. "Impaired Water Segments" are visible with a red cross hatch, "TMDL Completed" has a yellow cross hatch, and a "Restored" appears with a blue cross hatch. Each segment is labeled with the identification number found in the shapefile and the table. All maps include the Hydrologic Unit Code (HUC) number and the HUC name, legend, scale bar, inset map, GMPO logo, disclaimer for the state if one was provided, and the date the map was created. In all, 67 maps are created.

QA/QC Procedures: There are three EPA data sources: "Surf Your Watershed," "WATERS," and Decision Documents. Each data source is cross referenced with the other two sources to ensure there are no discrepancies in the listed impaired segments. The EPA data sources are from EPA- reviewed state documents.

Data Quality Reviews: There are no outside reviews of the report generated. The tales and maps generated for each cycle are uploaded to the "Surf Your Gulf Watershed" website located on the Gulf of Mexico Program home web page. This "Surf Your Gulf Watershed" details the impaired segments for the 13 priority areas.

Data Limitations: Data are updated every two years on "Surf Your Watershed" and in WATERS Expert Query Tool due to the fact that states submit a 303(d) report every two years on the status of the impaired segments in each state as required in Clean Water Act (CWA) 305(b) report.

Error Estimate: None identified.

References:

EPA's "Surf Your Watershed" http://cfpub.epa.gov/surf/locate/map2.cfm

EPA's WATERS (Watershed Assessment Tracking and Environmental Results) Expert Query Tool http://www.epa.gov/waters/tmdl/expert_query.html

EPA GMPO's Surf Your Gulf Watershed" http://www.epa.gov/gmpo/surfgulf/

<u>FY 2011 Performance Measure:</u>

- **Restore, enhance, or protect a cumulative number of acres of important coastal and marine habitats.**

Performance Database: Coastal Emergent wetlands border the Gulf of Mexico and include tidal saltwater and freshwater marshes and mangroves. Encompassing over two million hectares (five million acres or more than half of the national total), the Gulf of Mexico coastal wetlands serve as essential habitat for a diverse range of species.

Total wetland loss (coastal and inland) for the five Gulf States from 1780 until 1980 was estimated to be 40 million square kilometers, approximately 50%. Between 1985 and 1995 the southeastern U.S. lost the greatest area of wetland (51% of the national total).

Coastal emergent wetland loss for Louisiana represents 67% of the nation's total loss (177,625 hectares or 438,911 acres) from 1978 to 1990.

The Gulf of Mexico Program achieves its acreage goal each year by cooperative funding of projects that result in the enhancement, protection or restoration of coastal habitat. This coastal habitat includes marshes, wetlands, tidal flats, oyster beds, seagrasses, mangroves, dunes and maritime forest ridge areas.

Data Source: The amount of acreage restored, protected and enhanced by the Gulf of Mexico Program is derived from the individual project's Statement of Work contained within the project proposal. This acreage is then verified by the EPA Project Officer and by the project's Program Manager through site visits during the life of the project, quarterly reports submitted to the Gulf of Mexico Program Office (GMPO), aerial photography, ground-truthing, and digital topographic. Data verification occurs at the end of the project too.

Methods, Assumptions and Suitability: The Gulf of Mexico Program achieves this goal successfully each year by cooperatively funding restoration projects with our multiple federal and state program partners. Our partners additionally follow required QA/QC procedures and routinely conduct site visits to provide verification of the acreage restored. These partners and our process to restore, protect and enhance Gulf coastal habitat include:

1. Gulf of Mexico Program Office State Proposal Solicitation through Requests for Proposals (RFPs)
2. GMP Partnership Challenge Grant Program: *NOAA Community Restoration Grant Program* Supports Gulf Ecological Management Sites (GEMS)

QA/QC Procedures: The projects that are funded are required to provide a QA/QC plan if the restoration project involves monitoring. In those cases, EPA has documented Assistance Agreements with QA/QC approved plans. NOAA additionally requires QA/QC plans if the projects involve scientific monitoring. Additionally, the EPA Project Manager is required to conduct site visits, during the duration of the project to verify actual acreage restored, protected and/or enhanced. QA/QC includes but is not limited to, aerial photography, groundtruthing, transect growth monitoring and routine site visits of all funded projects.

Data Quality Reviews: Award Process for supporting habitat at restoration projects through partnership cooperative agreements.

1. Gulf of Mexico Program Office Competitive RFPs
2. GMP Partnership Challenge Grant Program:

A) NOAA Community Restoration Grant Program

Supports Gulf Ecological Management Sites (GEMS). The Gulf of Mexico Foundation, NOAA and the Gulf of Mexico Program established a Steering Committee to review and select the NOAA CRP projects for funding. The steering committee consists of EPA, all GEMS State Managers, NOAA, and USFWS staff and the Gulf of Mexico Foundation.

Ensure there is no duplication of funding and to seek opportunities for brokering with other restoration grant programs.

Review of the restoration data occurs in the field and through field analysis by the project manager as the project progresses. This review is accomplished through measures such as aerial photography, groundtruthing, transect growth monitoring and routine site visits of all funded projects. Data are verified by EPA and our Program Partners through site visits and quarterly reports.

Data Limitations: Limitations of use for the data are carefully detailed by the data provider and project manager for each project that yields acreage. Images and topographic data have routinely been used for restoration projects and few to no limitations are expected from these datasets beyond that of image resolution.

Error Estimate: The acreage is documented by the project managers for each project in required EPA Quarterly Reports. Data are subject to a second verification following the completion of the project.

References:

Status and Trends of the Nation's Biological Resources, Volume 1. U.S. Department of the Interior, U.S. Geological Survey, National Wetlands Research Center, 1998

The Gulf Community Restoration Partnership Program (GCRP). This program provides acreage through the combined efforts of the NOAA Community-Based Restoration Program and the Gulf of Mexico Program's Gulf Ecological Management Sites (GEMS) program and the Gulf States natural resource agencies and the Gulf of Mexico Foundation.
Website: http://www.gulfmex.org/restoration.htm

Handley, L., Altsman, D., and DeMay, R., eds., 2007, Seagrass Status and Trends in the Northern Gulf of Mexico: 1940–2002: U.S. Geological Survey Scientific Investigations Report 2006–5287, 267 p.

<u>FY 2011 Performance Measures:</u>

- At least 75% of the monitored stations in the near shore and coastal waters of the FKNMS will maintain chlorophyll a (CHLA) levels at less than or equal to .35 ugl-l and light clarity (Kd) levels at less than or equal to 0.20 m-l

- At least 75% of the monitored stations in the near shore and coastal waters of the FKNMS will maintain dissolved inorganic nitrogen (DIN) levels at less than or equal to .75 uM and total phosphorus (TP) levels at less than or equal to .35 uM

Performance Database: As required by the Florida Keys National Marine Sanctuary and Protection Act of 1990, EPA and its partners developed a comprehensive long-term

status and trends monitoring program as a critical component of the Water Quality Protection Program for the FKNMS. The comprehensive monitoring program was initiated in 1995 and includes water quality, coral reef and seagrass components. Annual results are reported each year on a fiscal- year basis. Historically, EPA has provided the majority of funding for the three monitoring projects, but other agencies (e.g., NOAA, U.S. Army Corps of Engineers (USACOE), and state/local government agencies) also provide significant funding.

Data Source: The Water Quality and Seagrass Monitoring Projects are conducted by Florida International University's Southeast Environmental Research Center (SERC) and the Coral Reef Evaluation and Monitoring Project is conducted by the Florida Fish and Wildlife Research Institute. EPA provides funding via cooperative agreements and the other government agencies provide funds via federal assistance agreements or contracts. Monitoring data are collected each year on an annual or quarterly basis depending on the project. Results of each monitoring project are reported in annual reports. The data for each monitoring project is collected and archived by staff of the Florida Fish and Wildlife Research Institute under a cooperative agreement with the EPA. In addition, the principal investigators for each monitoring project have developed Web sites where anyone can go and review the data
(http://ocean.floridamarine.org/fknms_wqpp/)

Methods, Assumptions and Suitability: The comprehensive monitoring program for the FKNMS was developed by a large group of technically competent and knowledgeable scientists familiar with the aquatic environment of the Florida Keys and the coral reef ecosystem. For each monitoring project, EPA worked closely with recognized experts to develop a detailed scope of work including sampling locations and frequency, parameters, field and analytical methods, quality assurance/quality control, data management, and reporting. The monitoring program was designed to provide representative coverage of the entire 2,900 square nautical miles of the Sanctuary. In general, monitoring sites were located throughout the FKNMS on a stratified-random basis and were determined to be compatible with EPA's Environmental Monitoring and Assessment Program protocol (http://www.epa.gov/region4/sesd/reports/epa904r01002.html). The overall monitoring program was designed to address the primary objective of the comprehensive long-term monitoring program for the FKNMS - to provide data needed to make unbiased, statistically rigorous statements about the "status of and trends in" selected water quality conditions and biological communities in the Sanctuary. For the monitoring program, the null hypothesis is that there is no change over time. The field data are tested against the null hypothesis that no change has occurred. All three monitoring projects (water quality, coral reef and seagrass) have demonstrated the ability to detect change over time and are suitable for determining the health of the coral reef ecosystem of the FKNMS.

QA/QC Procedures: The principal investigators for each monitoring project developed and submitted to EPA a Quality Assurance Project Plan (QAPP) to ensure that the data generated are accurate and representative of actual conditions and the degree of certainty of the data can be established. The QAPPs were developed in accordance with EPA

guidance documents and the principal investigators consulted with the Regional QA/QC Officer and the Project Officer for the monitoring projects. It was required that the QAPP be approved by EPA before any work could begin on a monitoring project.

Data Quality Review: Through the QAPP, the principal investigators explicitly commit to incorporating procedures that will reduce random and systematic errors. In addition, the principal investigators document quality assurance procedures and evaluate the quality of the data being generated by the monitoring projects. Further, the Technical Advisory Committee (TAC) of the Florida Keys National Marine Sanctuary reviews and assesses the monitoring projects and the data they produce on a regular and continuing basis.

Data Limitations: There are no known limitations of the data set.

Error Estimate: Coral Reef Evaluation and Monitoring Project – a power analysis was done at the beginning of the project to determine the limit of detectable change for the point count method used to determine the percent stony coral cover within the FKNMS. The estimate of actual performance is accurate to 2.4%.

Water Quality Monitoring Project – the project collects data from 154 sites within the FKNMS on a quarterly basis. Therefore, error estimates for the 2005 baseline values are mostly due to the large spatial variability and seasonal temporal variability. Because water quality data are not normally distributed, the project uses the median as the measure of central tendency. For chlorophyll a, the interquartile range (IQR) is 0.29 and the median absolute deviation (MAD) is 0.12. The light attenuation k_d IQR is 0.12 and the MAD is 0.05. Dissolved inorganic nitrogen has an IQR of 0.50 and a MAD of 0.26. For total phosphorus, the IQR is 0.90 and the MAD is 0.04.

Seagrass Monitoring Project – benthic plant community structure is measured using the rapid visual assessment technique known as the Braun-Blanquet method. This method is very quick, yet it is robust and highly repeatable, thereby minimizing among-observer differences. The Braun-Blanquet method has proven to be precise enough to detect subtle interannual variations yet robust enough to survive changes in personnel. A summary metric or species composition indicator (CSI) that assesses the relative importance of slow-growing plants to community composition is being computed for the 30 permanent seagrass monitoring sites. During the first 10 years of monitoring, this CSI index had an average of 0.48 ± 0.04 ($\pm$ one standard error of the mean). The significance of changes in the SCI will be assessed using these distribution parameters. Elemental content (carbon, nitrogen, and phosphorus) of seagrass leaves is determined by cleaning the leaves of all epiphytes, drying the leaves at low temperature, and grinding to a fine powder. Elemental content is then measured using established methods and calculating on a dry weight basis. Analyses are run in duplicate using independent NIST-traceable for each determination. If the duplicate analyses differ by more than 10%, additional samples are run. A summary elemental content indicator metric or elemental indicator (EI), which is the mean absolute deviation of the N:P ratio of seagrass tissue from 30:1 is computed for the 30 permanent monitoring sites. In 2006, the mean EI was 8.28 + 1.47

(± one standard error of the mean). The significance of changes in the EI will be assessed using these distribution parameters.

New/Improved Performance Data or Systems: The database management system for the Water Quality Protection Program of the FKNMS is geographic information based (GIS) and used to record the biological, physical, and chemical results from the comprehensive monitoring projects. The data from the three monitoring projects are collected and archived by the database managers at the Florida Fish and Wildlife Research Institute. The data archives component encompasses both raw and synthesized data. The data integration component incorporates the synthesized data, both tabular and geospatial. These data are integrated into a GIS to facilitate further analysis by scientists and managers. The results data contained within the database integration system are documented with project level metadata as well as attribute or parameter level metadata. Tools are being further developed to allow users to query data by location, date and parameters collected. The overall goal of the database management system is to provide a data integration system that takes into account the varying levels of data produced by the various monitoring projects and the needs of both managers and researchers.

References:
http://serc.fiu.edu/wqmnetwork/
www.serc.fiu.edu/wqmnetwork
http://www.serc.fiu.edu/wqmnetwork/
www.fiu.edu/~seagrass
http://ocean.floridamarine.org/fknms_wqpp
http://research.myfwc.com/features/category_sub.asp?id=2360

FY 2011 Performance Measure:

- **Improve the water quality of the Everglades ecosystem as measured by total phosphorus, including meeting the 10 parts per billion total phosphorus criterion throughout the Everglades Protection Area marsh and the effluent limits to be established for dischargers from stormwater treatment areas.**

Performance Database: As required by the Clean Water Act and Florida's Everglades Forever Act, the oligotrophic Everglades marsh within the Everglades Protection Area must meet the newly adopted 10 parts per billion numeric criterion for total phosphorus. EPA approved the criterion and its application methodology in 2005. A monitoring program to determine whether the criterion is in fact being met throughout the Everglades marsh is necessary to determine whether the water body can be expected to meet its designated use, whether phosphorus concentrations are stable or are increasing, whether the concentrations in impacted areas are improving, and whether watershed phosphorus control efforts costing in excess of $1 billion are effective.

Data Source: Water quality is monitored throughout the Everglades marsh at dozens of long-term monitoring stations. These stations are sampled cooperatively in a joint effort by Florida Department of Environmental Protection, South Florida Water Management

District, Everglades National Park, and Loxahatchee National Wildlife Refuge. Some of these stations were monitored previously by the United States Geological Survey beginning as long ago as 1953. Results of monitoring are reported in annual reports. The data are collected and are available to the public through a web site. Stormwater Treatment Area (STA) effluent phosphorus monitoring is in place as required by Florida and NPDES permits.

Methods, Assumptions and Suitability: The monitoring program was developed by scientists, with decades of experience regarding Everglades water quality and ecology, from the Florida Department of Environmental Protection, South Florida Water Management District, Everglades National Park, Loxahatchee National Wildlife Refuge and the EPA. The marsh monitoring program is designed to provide representative coverage of the entire 2,000 square mile freshwater Everglades. The monitoring program is capable of detecting temporal trends in phosphorus condition throughout the Everglades. The null hypothesis is that there is no change over time.

QA/QC Procedures: Field samples are collected by standard sampling protocol and analytical results are from accredited laboratories using standard methods. In addition, a series of ongoing laboratory round-robin exercises are overseen by the Florida Department of Environmental Protection. Field and lab protocol are also periodically reassessed by a Technical Oversight Committee that includes five Florida and federal agencies. Quality Assurance Project Plans are in place.

Data Quality Review: Water is sampled in the field by Department of Interior or South Florida Water Management District technical personnel using established Standard Operating Procedures. Data are subject to ongoing quality review by the interagency Technical Oversight Committee on a regular and continuing basis.

Data Limitations: There are no known limitations of the data set.

Error Estimate: Annual average total phosphorus concentrations are accurate to within 0.1 part per billion.

New/Improved Performance Data or Systems: Interagency dialogue and oversight provide ongoing reassessments that evaluate data credibility and completeness.

References:

http://www.epa.gov/waterscience/criteria/nutrient/ecoregions/
http:/www.sfmd.gov
http:/my.sfwmd.gov/portal/page?_pageid=2954.19761074&_dad=portal&_schema=PORTAL&navpage=home
http://www.dep.state.fl.us/labs/assessment/index.htm
http://www.dep.state.fl.us/labs/everglades/roundrobin.htm
http://wwwalker.net/#Selected%20Publications

FY 2011 Performance Measure:

Percent of the population in each of the U.S. Pacific Island Territories that has access to continuous drinking water meeting all applicable health-based drinking water standards measured on a four quarter rolling average basis

Performance Database: SDWIS (Safe Drinking Water Information System) is the database used to track this performance measure throughout the United States now including the Pacific territories. SDWIS contains basic water system information: population served, and detailed records of violations of the Safe Drinking Water Act and the statute's implementing health-based drinking water regulations. However, because of computational idiosyncrasies in CNMI (including double counting of bottle water service with utility-provided water, and areas which lack 24-hour water service), we apply a hand-correction to the CNMI figures.

Data Source: Health-based violations are reported by the territories. Percentage of population served by community drinking water systems receiving 24-hour water is obtained through direct communication with territory (CNMI only). Population data are obtained from U.S. Census data.

Methods, Assumptions and Suitability: Our method is to calculate the performance measure as the percentage of people in the territories served by public water systems who are receiving 24-hour water that meets all health-based drinking water standards (i.e., no health-based violations). We provide an aggregate value for the three Pacific territories using a weighted average based upon their populations. Our first main assumption is that a public water system must provide 24-hour water on a regular basis before it can provide drinking water that meets all health-based drinking water standards. This is an assumption that generally does not need to be made in the rest of the United States; and in the Pacific territories is an issue now solely in the CNMI. For example, the island of Saipan in the Northern Mariana Islands (population 70,000) is the only municipality of its size in the U.S. without 24-hour water (all but the poorest residents rely on bottled water or rain water as the main source of their drinking water). This method is suitable for the Pacific islands because the situation is unique to the Pacific Island territories, and is one of the underlying reasons for the need to track access to safe drinking water. Our second main assumption is that health-based violations reported by the territories are correct. Our third main assumption is that US Census data are correct.

QA/QC Procedures: The territories follow QA/QC procedures in the data submitted to EPA for entry into the SDWIS database. Routine data quality assurance and quality control analysis of SDWIS by the Agency revealed a degree of non-reporting of violations of health-based drinking water standards, and of violations of regulatory monitoring and reporting requirements. As a result, the Agency is now tracking and quantifying the quality of data reported to SDWIS/FED as part of the Agency's National Program Guidance. The Agency will continue to follow and update the Data Reliability Implementation/Action Plan. EPA will continue to review the results of on-site data verification (and eDV) and initiate a discussion with individual states concerning any potential discrepancies with the data reported to SDWIS/FED. The on-site DV will be

conducted as described in the Data Verification Protocol. Even as improvements are made, SDWIS serves as the best source of national information on compliance with Safe Drinking Water Act requirements for program management, the development of drinking water regulations, trend analyses, and public information.

Data Quality Reviews: Although the territories are responsible for reviewing and assuring quality of health-based violation reporting, EPA periodically communicates directly with public water systems to corroborate the data (and continues to do so as part of ongoing enforcement and compliance efforts). EPA is also in direct communication with the CNMI to obtain percentage of population receiving 24-hour water. The US Census is responsible for reviewing and assuring population data quality. There is no other peer review or external data quality review.

Data Limitations: Potential data limitations include: (a) potential for inconsistencies in reporting health-based violations among territories; and (b) inaccuracies due to imprecise measurement of percentage of population served by public water systems that receives 24-hour water.

Error Estimate: A quantitative estimate of error in the database is not possible.

New/Improved Data or Systems: Regarding SDWIS data, EPA has worked with the territories of Guam and CNMI over the last few years to improve performance on data collection and entry. Regarding percentage of population receiving 24-hour water, EPA continues to work closely with the CNMI public water system and the CNMI Division of Environment Quality to both more accurately assess percentage of population receiving 24-hour water, and to provide 24-hour water to an increasing percentage of the population.

References:
USEPA SDWIS/FED: http://www.epa.gov/safewater/databases/indexx.html

FY 2011 Performance Measure:

- **Percent of time sewage treatment plants in the U.S. Pacific Island Territories will comply with permit limits for biochemical oxygen demand (BOD) and total suspended solids (TSS)** (2005 Baseline: the sewage treatment plants in the Pacific Island Territories complied 59 percent of the time with BOD and TSS permit limits.)

Performance Database: ICIS (Integrated Compliance Information System) is used to track this performance measure.

Data Source: DMRs (Discharge Monitoring Reports) provided to EPA on a quarterly basis by the Pacific Island wastewater utilities are the data source.

Methods, Assumptions and Suitability: Permit conditions require each of the wastewater utilities to use EPA approved sampling methods. DMRs are self-reported by the Pacific island utilities to EPA on a quarterly basis for major facilities (greater than 1 million gallons per day of discharge). The main assumption is that the self-reported data are accurate.

QA/QC Procedures: Each of the Pacific island utility labs has and follows QA/QC procedures for this data.

Data Quality Reviews: EPA reviews the DMR reports to make sure they are thoroughly filled out. There are occasional EPA field audits of the utility labs.

Data Limitations: Potential data limitations include: (a) inconsistencies among personnel in performing sampling and analysis; and (b) incomplete data due to lack of sampling or lack of lab equipment.

Error Estimate: A quantitative estimate of error in the database is not possible.

New/Improved Data or Systems: EPA maintains communication with each of the utilities to improve sampling and analysis of BOD and TSS, and to improve reporting of DMRs.

References: N/A

FY 2011 Performance Measure:

- **Percent of days of the beach season that beaches in each of the U.S. Pacific Island Territories monitored under the Beach Safety Program will be open and safe for swimming.** (2005 Baseline: beaches were open and safe 64 percent of the 365-day beach season in American Samoa, 97 percent in CNMI and 76 percent in Guam.)

Performance Database: The data are stored in PRAWN (Program tracking Advisories, Water quality standards, and Nutrients), a database that includes fields identifying the beaches for which monitoring and notification information are available and the date the advisory or closure was issued, this enabling trend assessments to be made. The database also identifies those states that have received a BEACH (Beaches Environmental Assessment and Coastal Health) Act {P.L. 106-284} grant. EPA reports the information annually, on a calendar year basis, each May. The calendar year data are then used to support fiscal year commitments (e.g., 2009 calendar year data are used to report against FY 2010 commitments).

Data Source: Reports provided to EPA on a quarterly basis by the Pacific Island environmental agencies (Guam EPA, American Samoa EPA, CNMI DEQ) are the data sources.

Methods, Assumptions and Suitability: The Pacific Island environmental agencies use EPA-approved methods to take bacteriological samples at beaches and analyze them in their labs. They put together reports that include beach sampling data and number of days beaches were closed or had advisories posted based on bacteriological concerns. The Pacific Island environmental agencies submit these reports to EPA on a quarterly basis. EPA inputs data from the report into the PRAWN database. The main assumption is that the Pacific Island environmental agencies are following the EPA-approved methods for sampling and analysis. The secondary assumption is that EPA's contractor is correctly entering data from the reports.

QA/QC Procedures: Each of the Pacific Island environmental agencies has EPA-certified laboratories. Part of the certification process is establishing and adhering to QA/QC procedures.

Data Quality Reviews: EPA recertifies the labs on a periodic basis. Data quality from all lab procedures is reviewed.

Data Limitations: Potential data limitations include: (a) reporting inconsistencies within the database among jurisdictions which report on a quarterly basis (as the Pacific territories do) and on an annual basis.

Error Estimate: A quantitative estimate of error in the database is not possible.

New/Improved Data or Systems: EPA maintains communication with the Pacific territorial environmental agencies on changes in format which make it easier to enter data into the PRAWN database.

References:

U.S. EPA. Office of Water. "EPA's Beach Report: 2007 Swimming Season." EPA-823-F-08-006. Washington, DC May 2008. Available at http:/www.epa.gov/waterscience/beaches/seasons/2007/national.html

U.S. EPA. Office of Water. "National Beach Guidance and Required Performance Criteria for Grants. "EPA-823-B-02-004. Washington DC:EPA, June 2002. Available at http://www.epa.gov/waterscience/beaches/guidance/all.pdf

<u>FY 2011 Performance Measure:</u>

- **Protect, enhance, or restore acres of wetland habitat and acres of upland habitat in the Lower Columbia River watershed.**

Performance Database: The database used to track habitat restoration in the Lower Columbia River watershed is titled "Regional Restoration Project Inventory". The database includes at a minimum the following data fields: Project title, lead organization, project partners, latitude/longitude, and acreage. Results are updated annually on a fiscal year basis.

Data Source: Habitat restoration data are reviewed through direct communication with multiple agencies and partners conducting habitat restoration projects in the Lower Columbia River watershed, and the database is cross-referenced with other state, regional, and federal funding sources and project tracking databases. Due to the numerous partners involved in each project, and their involvement in the maintenance of the database, the confidence in the data accuracy and reliability is high.

Methods, Assumptions and Suitability: Habitat restoration data in the Lower Columbia River watershed is collected and tracked via direct and ongoing communication with the network of agencies and organizations conducting habitat restoration in the watershed. The main assumption for this method is that all agencies and organizations conducting habitat restoration in the watershed are included in the database review. The acreage indicator chosen is suitable for progress towards our goal because the restoration projects included in the database protect, enhance, and restore both wetland and upland habitat.

QA/QC Procedures: QA/QC procedures do not apply to tracking the Regional Restoration Project Inventory database. The database is reviewed by entities involved in or conducting habitat restoration projects in the Lower Columbia River watershed. The database is maintained annually, reviewed internally, distributed to regional entities conducting habitat restoration, and referenced when reporting several times annually. There is no Quality Management Plan or Quality Assurance Project Plan associated with this indicator.

Data Quality Reviews: The Regional Restoration Project Inventory is a database and reporting tool that employs the available level of project detail by multiple agencies and organizations. This tool is used internally and amongst agencies and organizations conducting habitat restoration in the Lower Columbia River watershed, therefore peer reviews, audits, and reports by external groups are not applicable.

Data Limitations: Potential data limitations include: (a) inconsistencies in or non-standard methods of acreage measurement, due to multiple agencies and organizations reporting; (b) inaccuracies due to imprecise measurement of acreage; (c) significant variability in the data, due to advancements in acreage calculation methods and therefore variable accuracy over time; (d) incomplete or inaccurate data from agencies and organizations that choose not to submit or review project data.

Error Estimate: Based on the level of involvement from agencies and organizations conducting habitat restoration in the Lower Columbia River, the quantitative estimate of actual performance and calculation of error in the database is not possible.

New/Improved Data or Systems: The tracking of habitat restoration project data in the Lower Columbia River watershed will improve with the advancement of tracking technologies, including GIS analysis, and the maintained communication with agencies and organizations conducting habitat restoration in the watershed. The management of the database will adapt to these advancements when technically and feasibly possible.

References: Lower Columbia River Restoration Inventory can be found at: http://www.lcrep.org/habitat_inventory.htm

FY 2011 Performance Measure:

- **Clean-up acres of known contaminated sediments [Columbia River]**

Performance Database: EPA's Regional Office will maintain a database of Columbia River data from the sources described below. Clean-up data are likely to be generated at Bradford Island, managed by the U.S. Army Corps of Engineers and the Oregon Department of Environmental Quality (ODEQ); Portland Harbor, an EPA Superfund site; and other small RCRA clean-up sites managed by ODEQ on the Columbia River.

Data Source: Information will be collected from state, federal and local agency partners. Information from the Bradford Island clean-up will be collected by the U.S. Army Corps of Engineers and the Oregon Department of Environmental Quality (ODEQ). Information from the Portland Harbor Superfund site will be collected by EPA and other partners. Information from RCRA clean-up sites will be collected by ODEQ. EPA directly oversees the work at Superfund sites; for clean-up sites managed by other entities, like the Corps of Engineers, EPA accepts the information received but does not independently verify the information.

Methods, Assumptions and Suitability: Acres are the unit of measurement used. Acreage reporting will be from EPA for Superfund work efforts and for non-Superfund work, acreage will be provided by state, federal and local agency partners.

QA/QC Procedures: EPA's Regional staff collects primary data based on site documents related to individual clean-up activities. EPA directly oversees the work at Superfund sites; for clean-up sites managed by other entities, like the Corps of Engineers, EPA accepts the information received but does not independently verify the information. There are Quality Assurance Project Plans (QAPPs) for individual sediment clean-up projects.

Data Quality Review: Sediment clean-up projects, such as those included under this measure, are very expensive. Closely managed construction projects are carried out by contractors under strict oversight by responsible parties (e.g., the Corps). The actual clean-up work is carefully overseen by parties with huge financial interests at stake and there is little realistic opportunity for significant error in counting acres addressed. Also, there is close monitoring of sediment data quality, as this is an objective of these clean-up projects.

Data Limitations: The actual clean-up work is carefully overseen by parties with huge financial interests at stake and there is little realistic opportunity for significant error in counting acres addressed. There is close monitoring of sediment data quality, as that is the objective of these cleanup projects.

Error Estimate: No error estimate is available for this data. No significant error in counting acres addressed expected.

New/Improved Data or Systems: N/A

References: http://www.deq.state.or.us/lq/ecsi/ecsi.htm
https://fortress.wa.gov/ecy/tcpwebreporting/Default.aspx

FY 2011 Performance Measure:

- **Demonstrate a 10 percent reduction in mean concentration of contaminants of concern found in water and fish tissue.**

Performance Database: Reduction in the mean concentration of contaminants of concern will be achieved through a variety of activities implemented by the States of Washington and Oregon, and EPA, specifically:

- Washington will be contributing to the target reduction through the implementation of two Water Quality Improvement Projects/Total Maximum Daily Loads (TMDLs), specifically the Yakima River TMDL and Walla Walla River TMDL. More information on the WA Ecology TMDL program can be found at: http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html
- Oregon will be contributing to the target reduction by the implementation of Pesticide Stewardship Partnership (PSP) in the Walla Walla River basin.

Data Sources:

- Data for the Washington portion of the Walla Walla River can be found in the Washington Ecology Walla Walla TMDL Evaluation (Technical Report) 04-03-032 (page 47) available at http://www.ecy.wa.gov/biblio/0703036.html. The Yakima River data is available at http://www.ecy.wa.gov/biblio/0703036.html. WA Ecology is seeing a decrease in contaminants from their TMDL work and that data can be found at http://www.ecy.wa.gov/eim/index.htm.
- Oregon's Walla Walla pesticide monitoring data can be found in Oregon DEQ's Laboratory Analytical Storage and Retrieval (LASAR) database: http://deq12.deq.state.or.us/lasar2/. Oregon Department of Environmental Quality (DEQ) developed a report on the 2005-2007 findings; a report on the 2005-2008 findings is expected soon. 2006 data was used as the baseline year, the year the monitoring locations were developed.

QA/QC Procedures: Oregon DEQ and Washington Ecology will be using standard data collection procedures for data collection and reporting for the Pesticide Stewardship Partnership and TMDL implementation targets.

WA Ecology monitoring work follows the Quality Assurance Project Plan (QAPPs). A major part of the WA Ecology report addresses data quality and collection procedures – pages 21-44 of the Walla Walla report and pages 15-20 of the Yakima report.

The Oregon DEQ Walla Walla pesticide water sampling and laboratory is conducted in accordance with a QAPP for the Pesticide Stewardship Partnership monitoring program and a specific Sampling Analysis Plan (SAP) for the Walla Walla project. Oregon DEQ has QA Officers that review these plans and ensure their sufficiency. The Walla Walla pesticide monitoring is more of a targeted, rather than probabilistic monitoring effort.

Data Quality Review: There have not been any audits of the Oregon work efforts or data. WA Ecology was audited but this data was not a part of that audit.

Data Limitations: The major limitation for this effort is that there is no specific funding to do this work. In 2006, EPA and state partners have identified some ongoing work that might be used to show a 10% reduction in only 5 sites in an immense river basin. These 5 sites are not representative of toxics reduction actions or understanding in the Basin; they only reflect very site specific situations. For Oregon DEQ, sampling and analytical problems do occur with the pesticide monitoring projects, such as an occasional broken lid on a sample jar or problems with the sample recovery rates during extractions. However, these problems are identified and documented in DEQ's sampling reports. If these problems or errors result lower quality data, the data is "graded" lower by DEQ. The grade of the data is then documented in DEQ's LASAR database. Further, if data quality doesn't meet minimum thresholds it's not included in the DEQ database**.**

Error Estimate: No error estimate is available for this data.

New/Improved Data or Systems: N/A

References:

- To find out more about Washington's Water Quality Improvement Projects (TMDLs), please visit the following site: http://www.ecy.wa.gov/programs/wq/links/wq_assessments.html.
- To find out more about Oregon Pesticide Stewardship Partnership Program, please visit this site: http://www.deq.state.or.us/wq/pubs/factsheets/community/pesticide.pdf

FY 2011 Performance Measure:

- **Restore the acres of tidally- and seasonally-influenced estuarine wetlands [Puget Sound]**

Performance Database: This measure is closely related to acres protected or restored for the National Estuary Program (NEP) measure. Puget Sound is one of 28 estuaries in the NEP. The Office of Wetlands Oceans and Watersheds has developed a standardized format for data reporting and compilation, defining habitat protection and restoration activities and specifying habitat categories. The National Estuary Program On-Line Reporting Tool (NEPORT) is a web-based database that EPA developed for NEPs to submit their annual Habitat reports. Links to NEPORT can be found at: http://www.epa.gov/owow/estuaries/neport . Annual results have been reported since 2000 for the NEP (results are calculated on a fiscal year basis).

Data Source: The Puget Sound Partnership is the current home for the Puget Sound NEP. It works with its partners to document the number of acres of habitat restored and protected. EPA conducts regular reviews of NEP implementation to help ensure that information provided in these documents is accurate, and progress reported is in fact being achieved.

Methods, Assumptions and Suitability: Measuring the number of acres of habitat restored and protected may not directly correlate to improvements in the health of the habitat reported, or of the estuary overall, but it is a suitable measure of on-the-ground progress. Habitat acreage does not necessarily correspond one-to-one with habitat quality, nor does habitat (quantity or quality) represent the only indicator of ecosystem health. Nevertheless, habitat acreage serves as an important surrogate and a measure of on-the-ground progress made toward EPA's annual performance goal of habitat protection and restoration in the NEP. "Restored and protected" is a general term used to describe a range of activities. The term is interpreted broadly to include created areas, protected areas resulting from acquisition, conservation easement or deed restriction, submerged aquatic vegetation coverage increases, permanent shellfish bed openings, and anadromous fish habitat increases.

QA/QC Procedures: Primary data are prepared by the staff of the NEP based on their own reports and from data supplied by other partnering agencies/organizations (that are responsible for implementing the action resulting in habitat protection and restoration). The NEP staff is requested to follow EPA guidance to prepare their reports, and to verify the numbers. EPA then confirms that the national total accurately reflects the information submitted by each program. EPA actions are consistent with data quality and management policies.

Data Quality Review: No audits or quality reviews conducted yet.

Data Limitations: Current data limitations include: information may be reported inconsistently (based on different interpretations of the protection and restoration definitions), acreage may be miscalculated or misreported, and acreage may be double counted (same parcel may also be counted by partnering/implementing agency or need to be replanted multiple years). In addition, measuring the number of acres of habitat restored and protected may not directly correlate to improvements in the health of the habitat reported (particularly in the year of reporting), but is rather a measure of on-the-ground progress made by the NEPs.

Error Estimate: No error estimate is available for this data.

New/Improved Data or Systems: NEPs provide latitude and longitude data (where possible) for each project. These data are then mapped to highlight where these projects are located in each NEP study area. Not only does this assist both the individual NEP and EPA in obtaining a sense of geographic project coverage, but it provides a basis from which to begin exploring cases where acreage may be double-counted by different

agencies. An on-line reporting system NEPORT has been developed for the NEPs use that will assist in tracking habitat projects. EPA has taken steps to align NEPORT data fields with those of the National Estuarine Restoration Inventory (NERI) and with the President's Wetlands Initiative, developed for interagency use.

References: Links to NEPORT can be found at: http://www.epa.gov/owow/estuaries/neport .

FY 2011 Performance Measure:

- **Improve water quality and enable the lifting of harvest restrictions in acres of shellfish bed growing areas impacted by degraded or declining water quality [Puget Sound]**

Performance Database: This measure is related to acres protected or restored for the National Estuary Program (NEP). Puget Sound is one of 28 estuaries in the NEP. The Office of Wetlands Oceans and Watersheds has developed a standardized format for data reporting and compilation, defining habitat protection and restoration activities and specifying habitat categories. Upgrading shellfish bed classifications is included. The National Estuary Program On-Line Reporting Tool (NEPORT) is a web-based database that EPA developed for NEPs to submit their annual Habitat reports. Links to NEPORT can be found at: http://www.epa.gov/owow/estuaries/neport . Annual results have been reported since 2000 for the NEP (results are calculated on a fiscal year basis).

Data Source: The Puget Sound Partnership is the current home for the Puget Sound NEP. It works with its partners to document the number of acres of habitat restored and protected. With respect to shellfish bed classification the Washington State Department of Health (WDOH) is the entity that determines and tracks the status of shellfish beds. EPA conducts regular reviews of NEP implementation to help ensure that information provided in these documents is accurate, and progress reported is in fact being achieved.

Methods, Assumptions and Suitability: Measuring the number of acres of shellfish beds with harvest restrictions lifted is not a direct measure of habitat quality, but it is a measure of improving water quality with respect to fecal coliform contamination. This acreage serves as an important surrogate for water quality and human health protection in Puget Sound.

QA/QC Procedures: The Washington Department of Health does the sampling and analysis, which forms the basis of their shellfish bed status determinations. They have established QA/QC procedures. NEP staff utilize the State reported data on areas that have been the subject of restoration efforts.

Data Quality Review: No audits or quality reviews of the primary data have been conducted by EPA.

Data Limitations: Data are limited to the commercial shellfish beds which are monitored by the WDOH.

Error Estimate: No error estimate is available for this data.

New/Improved Data or Systems: NEPs provide latitude and longitude data (where possible) for each project. These data are then mapped to highlight where these projects are located in each NEP study area. An on-line reporting system NEPORT has been developed for the NEPs' use that will assist in tracking habitat projects.

References: Links to NEPORT can be found at: http://www.epa.gov/owow/estuaries/neport .

FY 2011 Performance Measure:

- **Remediate acres of prioritized contaminated sediments [Puget Sound]**

Performance Database: EPA's Regional office will maintain a database of Puget Sound contaminated sediment remediation using the Comprehensive Environmental Response, Compensation & Liability Information System (CERCLIS) used by the Agency's Superfund program. The CERCLIS database contains information on the types of contaminated sediments/ toxics present in selected sites, as well as some baseline data against which remediation results may be derived.

Data Source: The CERCLIS database tracks Superfund sites only. Superfund site information includes remedial designs, feasibility studies and projects at contaminated sediment sites where remedial actions plans have been implemented. The CERCLIS database also tracks Federal completions, e.g., Superfund sites where federal clean-up activities have been completed.

Methods, Assumptions and Suitability: The CERCLIS database documents the remedial actions and Federal completions of projects to clean-up Superfund sites. Within Puget Sound, a Federal completion could correlate to a specific contaminated sediment site and the number of acres that were remediated. Actual data on the number of acres remediated will be in background documents related to the particular remediation project. Activities completed, which include prioritized contaminant remediation (removal, capping, or other remedial strategies), will count in terms of acres, or portions of an acre remediated. Other databases, such as the EPA Brownfields program database and the RCRA-Online database may be useful as additional sources of contaminated sediment remediation data for the Puget Sound sites. These additional databases may be considered in the future.

QA/QC Procedures: Primary data are prepared by the Superfund staff based on site documents related to individual clean-up activities. EPA directly oversees the work at Superfund sites. There are standard operating procedures and data control procedures applied to CERCLIS data. Data are reviewed quarterly and the data control plan is

reviewed annually. There are Quality Assurance Project Plans (QAPPs) for individual sediment clean-up projects.

Data Quality Review: Sediment clean-up projects, such as those included under this measure, are very expensive. Closely managed construction projects are carried out by contractors under strict oversight by EPA. There is close monitoring of sediment data quality, as this is an objective of these clean-up projects too. EPA does periodic audits or quality reviews on Superfund site data and the CERCLIS database.

Data Limitations: At this time, data on contaminated sediment remediation within Puget Sound in the CERCLIS database are limited to sites where an EPA Superfund remediation plan has been developed and implemented. The CERCLIS database only recently began tracking the number of acres cleaned up and the specific sites where contaminated sediment remediation has occurred. A new module for tracking this site-specific data was added to the database in June 2007.

Error Estimate: No error estimate is available for this data.

New/Improved Data or Systems: At present, the EPA Regional office plans to use the existing CERCLIS database to manage data for the performance measure.

References: Link to the Superfund Site Information System at:
http://cfpub.epa.gov/supercpad/cursites/srchsites.cfm

GOAL 4 OBJECTIVE 4

FY 2011 Performance Measure:

- **Number of states using a common monitoring design and appropriate indicators to determine the status and trends of ecological resources and the effectiveness of national programs and policies (program assessment measure)**

Performance Database: Internal Regional EPA tracking system.

Data Source: Data are derived from internal assessments of state activities.

Methods, Assumptions and Suitability: Data for this measure are collected based on assessments of the number of states using Environmental Monitoring and Assessment Program (EMAP) data to monitor the condition of ecological resources. EMAP data are generated, in part, by a cooperative agreement with twenty-three states to conduct the National Coastal Assessment Monitoring survey, which introduces a standard protocol for monitoring the ecological condition of estuaries; including, probabilistic sampling designs, response designs for indicators, laboratory analyses, statistical analyses and reporting formats.

QA/QC Procedures: N/A

Data Quality Reviews: N/A

Data Limitations: N/A

Error Estimate: N/A

New/Improved Data or Systems: EPA anticipates by 2007 all states will have adopted and implemented the National Coastal Assessment Monitoring survey. Improvements in the management of contracts, coordination of the shipment of samples, and distribution of resulting data are now performed by EPA to give states without capability the opportunity to partner with the agency.

References: EMAP data, available at: http://www.epa.gov/docs/emap/index.html (last accessed on July 20, 2007)
US EPA. 2001. Environmental Monitoring and Assessment Program (EMAP): National Coastal Assessment Quality Assurance Project Plan, 2001-2004. EPA/620/R-01/002. Office of Research and Development, National Health and Environmental Effects Research Laboratory, Gulf Ecology Division, Gulf Breeze, FL.
Ecological Research Program Review, available at: http://www.whitehouse.gov/omb/expectmore/summary/10001135.2005.html (last accessed August 16, 2007)

<u>FY 2011 Performance Measures:</u>

- **Percentage of planned outputs delivered in support of public health outcomes long-term goal (program assessment measure)**
- **Percentage of planned outputs delivered in support of mechanistic data long-term goal (program assessment measure)**
- **Percentage of planned outputs delivered in support of the aggregate and cumulative risk long-term goal (program assessment measure)**
- **Percentage of planned outputs delivered in support of the susceptible subpopulations long-term goal (program assessment measure)**
- **Percentage of planned outputs delivered in support efficient and effective clean-ups and safe disposal of contamination wastes.**
- **Percentage of planned outputs delivered in support of water security initiatives**
- **Percentage of planned outputs delivered in support of HHRA health assessments. (program assessment measure)**
- **Percentage of planned outputs delivered in support of Air Quality Criteria/Science Assessment documents (program assessment measure)**
- **Percentage of planned outputs delivered in support of HHRA Technical Support Documents (program assessment measure)**
- **Percent progress toward completion of a framework linking global change to air quality. (program assessment measure)**

- **Percentage of planned outputs delivered in support of State, tribe, and relevant EPA office needs for causal diagnosis tools and methods to determine causes of ecological degradation and achieve positive environmental outcomes. (program assessment measure.)**
- **Percentage of planned outputs delivered in support of State, tribe, and relevant EPA office needs for environmental forecasting tools and methods to forecast the ecological impacts of various actions and achieve positive environmental outcomes (program assessment measure).**
- **Percentage of planned outputs delivered in support of State, tribe, and relevant EPA office needs for environmental restoration and services tools and methods to protect and restore ecological condition and services to achieve positive environmental outcomes (program assessment measure).**
- **Percentage of planned outputs delivered in support of the Safe Pesticides, Safe Products program's long term goal one.**
- **Percentage of planned outputs delivered in support of the Safe Pesticides, Safe Products program's long term goal two.**
- **Percentage of planned outputs delivered in support of the Safe Pesticides, Safe Products program's long term goal three.**

Performance Database: Integrated Resources Management Systems (internal database) or other internal tracking system.

Data Source: Data are generated based on self-assessments of completion of planned program outputs.

Methods, Assumptions and Suitability: To provide an indication of progress towards achievement of a program's long-term goals, each program annually develops a list of key research outputs scheduled for completion by the end of each fiscal year. This list is finalized by the start of the fiscal year, after which no changes are made. The program then tracks quarterly the progress towards completion of these key outputs against pre-determined schedules and milestones. The final score is the percent of key outputs from the original list that are successfully completed on-time.

QA/QC Procedures: Procedures are now in place to require that all annual outputs be clearly defined and mutually agreed upon within ORD by the start of each fiscal year. Progress toward completing these activities is monitored by ORD management

Data Quality Reviews: N/A

Data Limitations: Data do not capture the quality or impact of the research outputs being measured. However, long-term performance measures and independent program reviews are used to measure research quality and impact. Additionally, completion rates of research outputs are program-generated, though subject to ORD review.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: Human Health Multi-Year Plan, available at: http://epa.gov/osp/myp/hh.pdf (last accessed July 20, 2007).
Global Change Research Multi-Year Plan, available at: http://epa.gov/osp/myp/global.pdf (last accessed July 20, 2007)
Human Health Risk Assessment Multi-Year Plan, available at: http://epa.gov/osp/myp/hhra.pdf (last accessed July 20, 2007).
Safe Pesticides/Safe Products Multi-Year Plan, available at: http://epa.gov/osp/myp/sp2.pdf (last accessed July 20, 2007)
Ecological Research Multi-Year Plan, available at: http://epa.gov/osp/myp/eco.pdf (last accessed July 20, 2007)
Human Health Research Program Assessment, available at: http://www.whitehouse.gov/omb/expectmore/summary/10004373.2005.html (last accessed August 16, 2007)
Global Change Research Program Assessment, available at: http://www.whitehouse.gov/omb/expectmore/summary/10004307.2006.html (last accessed August 16, 2007)
Human Health Risk Assessment Program Assessment, available at: http://www.whitehouse.gov/omb/expectmore/summary/10004308.2006.html (last accessed August 16, 2007)

FY 2011 Performance Measures:

- **Percentage of Human Health program publications rated as highly cited papers (program assessment measure).**
- **Percentage of SP2 publications rated as highly cited publications (program assessment measure).**
- **Percentage of SP2 publications in "high impact" journals (program assessment measure).**
- **Percentage of Ecological Research publications rated as highly-cited publications.**
- **Percentage of Ecological Research publications in "high-impact" journals.**
- **Percentage of Global publications rated as highly cited publications.**
- **Percentage of Global publications in high impact journals.**

Performance Database: No internal tracking system.

Data Source: Searches of Thomson Scientific's *Web of Science* and *Scopus* are conducted to obtain "times cited" data for programs' publications. Analyses are completed using Thomson's *Essential Science Indicators (ESI)* and *Journal Citation Reports (JCR)* as benchmarks. *ESI* provides access to a unique and comprehensive compilation of essential science performance statistics and science trends data derived from Thomson's databases.

Methods, Assumptions and Suitability: For influence and impact measures, *ESI* employs both total citation counts by field and cites per paper scores. The former reveals gross influence while the latter shows weighted influence, also called impact. *JCR* is a recognized authority for evaluating journals. It presents quantifiable statistical data that provide a systematic, objective way to evaluate the world's leading journals and their impact and influence in the global research community. The two key measures used in this analysis to assess the journals in which a program's papers are published are the Impact Factor and Immediacy Index. The Impact Factor is a measure of the frequency with which the "average article" in a journal has been cited in a particular year. The Impact Factor helps evaluate a journal's relative importance, especially when compared to other journals in the same field.

QA/QC Procedures: N/A

Data Quality Reviews: N/A

Data Limitations: Analyses do not capture citations within EPA regulations and other key agency documents.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: Bibliometric Analysis for the U.S. Environmental Protection Agency/Office of Research and Development's Safe Pesticides/Safe Products Research Program, available at: http://es.epa.gov/ncer/publications/bibliometrics/sp_bibliometric_1206.pdf (last accessed on July 20, 2007)
Bibliometric Analysis for the U.S. Environmental Protection Agency/Office of Research and Development's Ecological Research Program, available at: http://es.epa.gov/ncer/publications/bibliometrics/eco_full_analysis.pdf (last accessed on July 20, 2007)
Bibliometric Analysis for the U.S. Environmental Protection Agency/ Office of Research and Development's Human Health Research Program, available at: http://es.epa.gov/ncer/publications/bibliometrics/human_health_bibliometric_121306.html (last accessed August 16, 2007)
Human Health Research Program Assessment, available at: http://www.whitehouse.gov/omb/expectmore/summary/10004373.2005.html (last accessed August 16, 2007)
EPA Ecological Research Program Assessment, available at: http://www.whitehouse.gov/omb/expectmore/summary/10001135.2007.html (last accessed January 24, 2008)
EPA Pesticides and Toxics Research Program Assessment, available at: http://www.whitehouse.gov/omb/expectmore/summary/10009012.2007.html (last accessed January 24, 2008)

<u>FY 2011 Performance Measure:</u>

- **Average cost to produce Assessment documents (efficiency measure)**

Performance Database: N/A

Data Source: Data are generated based on self-tracking of cost per Air Quality Criteria/ Science Assessment document.

Methods, Assumptions and Suitability: The Human Health Risk Assessment (HHRA) Program's efficiency measure tracks the cost to produce AQCDs for use by the Office of Air and Radiation in developing their policy options for the NAAQS. Total FTE and extramural dollar costs are cumulated over a five year period and divided by the number of AQCDs produced in this time period, to create a moving annual average $/AQCD.

QA/QC Procedures: N/A

Data Quality Reviews: N/A

Data Limitations: Data do not capture the quality or impact of the program activities. However, other performance measures and independent program reviews are used to measure the quality and impact of the program.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: Human Health Risk Assessment Program Assessment: http://www.whitehouse.gov/omb/expectmore/summary/10004308.2006.html (last accessed August 16, 2007)

<u>FY 2011 Performance Measure:</u>

- **Average time (in days) to process research grant proposals from RFA closure to submittal to EPA's Grants Administration Division, while maintaining a credible and efficient competitive merit review system (as evaluated by external expert review) (efficiency measure)**

Performance Database: N/A

Data Source: Data are generated based on self-tracking of grants processing time.

Methods, Assumptions and Suitability: The Human Health Program's efficiency measure tracks the average time to process and award grants.

QA/QC Procedures: N/A

Data Quality Reviews: N/A

Data Limitations: Data do not capture the quality or impact of the program activities. However, other performance measures and independent program reviews are used to measure the quality and impact of the program.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: N/A

FY 2011 Performance Measure:

- **Percent variance from planned cost and schedule (program assessment efficiency measure)**

Performance Database: Integrated Resources Management System (internal database).

Data Source: Data are generated based on 1) self-assessments of progress toward completing research goals, and 2) spending data.

Methods, Assumptions and Suitability: The Global Research Program, Pesticides and Toxics Research Program, and Ecological Research Program have all adopted this efficiency measure. Using an approach similar to Earned Value Management, the data are calculated by: 1) determining the difference between planned and actual performance for each long-term goal (specifically, determining what percent of planned program outputs were successfully completed on time), 2) determining the difference between planned and actual cost for each long-term goal (specifically, determining the difference between what the program actually spent and what it intended to spent), and 3) dividing the difference between planned and actual performance by the difference between planned and actual cost.

QA/QC Procedures: N/A

Data Quality Reviews: N/A

Data Limitations: Program activity costs are calculated through both actual and estimated costs when activities are shared between programs. Performance data reflects only the key program outputs, and does not include every activity completed by a program. Additionally, completion rates of research outputs are program-generated, though subject to ORD review.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: N/A

FY 2011 Performance Measures:

- **Utility of ORD's causal diagnosis tools and methods for States, tribes, and relevant EPA offices to determine causes of ecological degradation and achieve positive environmental outcomes. (program assessment measure)**

- **Utility of ORD's environmental forecasting tools and methods for States, tribes, and relevant EPA offices to forecast the ecological impacts of various actions and to achieve environmental outcomes. (program assessment measure)**

- **Utility of ORD's environmental restoration and services tools and methods for States, tribes, and relevant EPA offices to protect and restore ecological condition and services to achieve positive environmental outcomes. (program assessment measure)**

Performance Database: N/A

Data Source: Data are generated through an independent expert review panel process. EPA's Board of Scientific Counselors (BOSC) provides rating of program progress on each long-term goal.

Methods, Assumptions and Suitability: These measures capture the assessment by an independent expert review panel of the appropriateness, quality, and use of the program's research under each long-term goal. Using a well-defined, consistent methodology, the BOSC provides a qualitative rating and summary narrative regarding the performance of each long-term goal. Rating categories include: Exceptional, Exceeds Expectations, Meets Expectations, and Not Satisfactory. Full ratings are expected approximately every 4 years, although the BOSC will provide progress ratings at the mid-point between full program reviews.

QA/QC Procedures: All long-term goal ratings are determined using a well-defined, consistent methodology that was developed in conjunction with EPA, OMB, and the BOSC.

Data Quality Reviews: N/A

Data Limitations: N/A

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: Ecological Research Multi-Year Plan, available at: http://epa.gov/osp/myp/eco.pdf (last accessed July 20, 2007)

FY 2011 Performance Measure:

- **Percentage of regulatory decisions in which decision-makers used HHRA peer-reviewed health assessments (program assessment measure)**

Performance Database: No internal tracking system.

Data Source: N/A

Methods, Assumptions and Suitability: A list of the research program's publications from the past ten years are searched against EPA's electronic dockets to determine if any regulatory decisions and other key agency documents have referenced the Human Health Risk Assessment program's health assessments.

QA/QC Procedures: N/A

Data Quality Reviews: N/A

Data Limitations: Not all EPA's regulations and key decisions are posted in the electronic dockets and, therefore, the impact and influence of the program's publications would not be captured in this measure. Additionally, the publication citations within the regulations can be inconsistent and often do not reflect the research models, tools or personal scientific support that informed the regulatory decision.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: Human Health Risk Assessment Program Assessment, available at: http://www.whitehouse.gov/omb/expectmore/summary/10004308.2006.html (last accessed August 25, 2008)

GOAL 5 OBJECTIVE 1

<u>FY 2011 Performance Measures:</u>

- **Reduce, treat, or eliminate air pollutants through concluded enforcement actions.**
- **Reduce, treat, or eliminate water pollutants through concluded water enforcement actions.**
- **Reduce, treat, or eliminate toxics and pesticides through concluded enforcement actions.**
- **Reduce, treat, or eliminate hazardous waste through concluded enforcement actions.**

Performance Databases: The Integrated Compliance Information System Federal Enforcement & Compliance (ICIS FE&C) database tracks EPA judicial and administrative civil enforcement actions.

Data Source: The ICIS FE&C database collects essential environmental results data in Case Conclusion Data Sheets (CCDS), which Agency staff prepare after conclusion of each civil, judicial, and administrative enforcement action. EPA implemented the CCDS in 1996 to capture relevant information on the results and environmental benefits of concluded enforcement cases. The CCDS form consists of 22 specific questions which, when completed, describe specifics of the case; the facility involved; information on how the case concluded; compliance actions required for defendant(s); the costs involved; information on any Supplemental Environmental Project to be undertaken as part of the settlement; the amount and type of any penalties assessed; and any costs recovered through the action, if applicable.

Methods, Assumptions and Suitability: For enforcement actions resulting in immediate pollutants reduced, treated, or eliminated, staff estimate the amount of reduction at the time the enforcement action concludes. For enforcement actions resulting in pollutants reduced, treated, or eliminated long-term, staff estimate the reduction for an average year. EPA staff use established statute methodologies, e.g. Clean Water Act (CWA), to calculate the pollutant reductions or eliminations. The calculation determines the difference between the current out of compliance quantity of pollutants released and the post enforcement action in compliance quantity of pollutants released. EPA then converts the difference into standard units of measure.

QA/QC Procedures: The ICIS FE&C data system meets Office of Environmental Information (OEI) Lifecycle Management Guidance, which includes data validation processes, internal screen audit checks and verification, system and user documents, data quality audit reports, third party testing reports, and detailed report specifications data calculation methodology.

Data Quality Review: Each office within the Office of Enforcement and Compliance Assurance (OECA) prepares Quality Management Plans (QMPs) every five years.

To satisfy the Government Performance and Results Act (GPRA), the Agency's information quality guidelines, and other significant enforcement and compliance policies on performance measurement, OECA instituted a semiannual executive certification of the overall accuracy of ICIS information. Additionally, OC has a quarterly data review process to ensure timely input, data accuracy, and reliability of EPA's enforcement and compliance information.

Data Limitations: Pollutant reductions or eliminations reported in CCDS project an estimate of pollutants to be reduced or eliminated if the defendant carries out the requirements of the settlement. (Information on expected outcomes of state enforcement is not available.) The estimates use information available at the time a case settles or an order is issued. In some instances, EPA develops and enters this information on pollutant reduction estimates after the settlement or during continued discussions over specific plans for compliance. Due to the time required for EPA to negotiate a settlement agreement with a defendant, there may be a delay in completing the CCDS. Additionally, because of unknowns at the time of settlement, different levels of technical proficiency, or the nature of a case, OECA's expectation is that the overall amount of pollutants reduced or eliminated is prudently underestimated based on CCDS information. EPA also bases the pollutant estimates on the expectation that the defendant/respondent implements the negotiated settlement agreement.

Error Estimate: Not available

New & Improved Data or Systems: ICIS FE&C became operational in June 2002. This data system has all of the functionality of the legacy Civil Enforcement Docket system but has an additional feature for tracking EPA enforcement and compliance activities. Additionally, ICIS-NPDES is being phased-in to ICIS FE&C as the database of record for the CWA National Pollutant Discharge Elimination System (NPDES) program. ICIS-NPDES includes all federal and state enforcement, compliance and permitting data. States are currently migrating to ICIS NPDES from the legacy data system, the Permit Compliance System (PCS). States enter data in phases in ICIS-NPDES in accordance with current data and system capabilities. The migration process is projected to be completed in FY2013. As a state's data migrates from PCS to ICIS-NPDES, so too does the state's NPDES federal compliance and enforcement data. As of June 2009, ICIS-NPDES has a new feature that did not exist in the legacy system and that is the capability to accept electronic Discharge Monitoring Report (DMR) data directly from facilities. This new electronic data reporting functionality is expected to increase the quality and timeliness of the DMR data in ICIS-NPDES. To date ICIS-NPDES is the national system of record for 31 states (including DC, VI, PR), 2 tribes, 9 territories and Gulf of Mexico facilities in Region 6.

References: Quality Assurance and Quality Control procedures: Data Quality: Life Cycle Management Guidance, (IRM Policy Manual 2100, dated September 28, 1994,

reference Chapter 17 for Life Cycle Management); CCDS, Training Booklet, issued November 2000; Quick Guide for CCDS, issued November 2000; and Guide for Calculating Environmental Benefits of Enforcement Cases: FY2005 CCDS Update issued August 2004 available: http://intranet.epa.gov/oeca/oc/resources/ccds/ccds.pdf; Information Quality Strategy and OC=s Quality Management Plans: Final Enforcement and Compliance Data Quality Strategy, and Description of FY 2002 Data Quality Strategy Implementation Plan Projects, signed March 25, 2002. ICIS: U.S. EPA, OECA, ICIS Phase I, implemented June 2002.

FY 2011 Performance Measures:

- **Total number of regulated entities that change behavior resulting in direct environmental benefits or the prevention of pollution into the environment for air as a result of EPA enforcement and compliance actions.**
- **Total number of regulated entities that change behavior resulting in direct environmental benefits or the prevention of pollution into the environment for water as a result of EPA enforcement and compliance actions.**
- **Total number of regulated entities that change behavior resulting in direct environmental benefits or the prevention of pollution into the environment for land as a result of EPA enforcement and compliance actions.**

Performance Database: ICIS FE&C and manual reporting by regions.

Data source: ICIS FE&C captures behavioral change information resulting from EPA enforcement settlements, compliance incentive audits, direct EPA compliance assistance, and federal inspections resulting in direct or preventative environmental benefits. EPA collects most of the essential data on the behavioral change information through the Inspection Conclusion Data Sheet (ICDS), the Compliance Assistance Conclusion Data Sheet (CACDS), or the Case Conclusion Data Sheet (CCDS), which Agency staff prepare after the conclusion of each action. Similar to the CCDS form, the ICDS and CACDS forms consist of specific questions which, when completed, describe specific activities taken by the facility operator or the compliance assistance recipient which result in direct environmental improvements or pollution prevention.

Methods, Assumptions and Suitability: The ICDS collects information on key activities and outcomes observed by EPA at facilities during on-site inspections and evaluations. This includes information about identified deficiencies (potential violations) communicated to the facility by the inspector during an on-site inspection/evaluation; whether the facility addressed any deficiencies identified during an on-site inspection/evaluation; and whether the inspector provided compliance assistance during an on-site inspection/evaluation. The information from the completed ICDS form is either entered into ICIS or reported manually (some regions participating in the Underground Injection Control (UIC) database pilot use this method). Also, Expedited Settlement Offer (ESO) data is used when calculating the total number of regulated entities that change behavior from inspections and evaluations that result in direct

environmental benefits, e.g. getting into compliance with appropriate regulations as a result of complying actions.

EPA compliance assistance providers use the Compliance Assistance Conclusion Data Sheet (CACDS) to report information from direct compliance assistance delivered by EPA. The form records EPA on-site observations of entities reducing, treating, or eliminating pollution during on-site direct compliance assistance. The EPA on-site assistance provider uses the CACDS form to record the type of compliance assistance provided, the entity receiving the compliance assistance, and the date compliance assistance occurred. ICIS stores information from the completed CACDS forms.

The CCDS documents whether the defendant/respondent, in response to an order for injunctive relief or otherwise in response to an enforcement action will: (1) implement controls that will reduce pollutants; and/or (2) improve environmental management practices to curtail, eliminate or better monitor and handle pollutants in the future.

The performance measure is a summation of the enforcement, compliance monitoring, compliance incentives, and direct EPA compliance assistance activities resulting in direct environmental benefits or pollution prevention.

QA/QC: The ICIS FE&C data system meets Office of Environmental Information Lifecycle Management Guidance, which includes data validation processes, internal screen audit checks and verification, system and user documents, data quality audit reports, third party testing reports, and detailed report specifications for showing how data are calculated.

Data Quality Review: Each office within the Office of Enforcement and Compliance Assurance (OECA) prepares Quality Management Plans (QMPs) every five years.

To satisfy the Government Performance and Results Act (GPRA), the Agency's information quality guidelines, and other significant enforcement and compliance policies on performance measurement, OECA instituted a requirement for semiannual executive certification of the overall accuracy of ICIS information. Additionally, OC has a quarterly data review process to ensure timely input, data accuracy, and reliability of EPA's enforcement and compliance information.

Data Limitations: EPA counts the number of enforcement activities resulting in reduced pollution or improved environmental management practices under the assumption that the defendant will implement the negotiated settlement agreement.

Error Estimate: None

New & Improved Data or Systems: Same information on improvements to ICIS FE&C in the above performance measurement section.

References: US EPA, ICIS Compliance Assistance Module, February 2004; US EPA, Compliance Assistance in the Integrated Compliance Information System Guidance, February 20, 2004. US EPA, 2005 Guidance Addendum for Reporting Compliance Assistance in the ICIS, March 2005.

FY 2011 Performance Measures:

- **Percent of recidivism.**
- **Percent of closed cases with criminal enforcement consequences (indictment, conviction, fine or penalty).**

Performance Databases: The Criminal Case Reporting System (CCRS) stores criminal enforcement data in an enforcement-sensitive database which contains historical data on all criminal enforcement prosecutions. The data used for all criminal enforcement performance measures are in the CCRS database.

Data Source: Data entered into the CCRS for the "percent of closed cases with criminal enforcement consequences" come from the Investigative Activity Report (IAR) which tracks a criminal investigation from the time EPA opens a case. The IAR indicates when EPA files a case with the Department of Justice (DOJ) (i.e., an indictment by a grand jury) or when DOJ obtains criminal information (i.e., the defendant will plead guilty). Case closing checklists occur when a case concludes. Data dealing with the fine or penalty from the final Judgment and Commitment Orders ("J&C") are the formal sentencing documents issued by the U.S. District Court. The J&C also serves as the sentencing data for the performance measure on the "percentage of recidivism".

Methods, Assumptions and Suitability: The methodology for the "percent of recidivism" measure employs a rolling 12 year baseline (i.e., initial targets and baselines were based on FY 1997-2008 data, while subsequent baselines will be based on FY 1998-2009, FY 1999-2010, etc). The methodology identifies "repeat" violators under *any* of the environmental statutes [e.g. a defendant convicted of a CWA violation in FY 2000 that was subsequently *convicted* (not merely indicted, but subsequently acquitted) of a subsequent RCRA violation in FY 2007 meets the definition of a "recidivist."] The methodology distinguishes between a "recidivist" (whose second crime occurs after prosecution and sentencing for the initial violation) and defendants who commit multiple environmental crimes that overlap chronologically. The definition of a "recidivist" also covers a defendant who -- after prosecution for an initial environmental crime -- may subsequently commit a *civil* environmental violation. OECA's ICIS database is the source for data on defendants who meet the definition of a "recidivist."

QA/QC Procedures: All criminal enforcement special agents receive training on the accurate completion of IAR reports and the entry of criminal case data into the CCRS. Quarterly case management reviews by senior management assure the accuracy of the data contained in the reports. The Criminal Investigations Division (CID) has a process in place for document control and records management.

Each office within the Office of Enforcement and Compliance Assurance (OECA) prepares Quality Management Plans (QMPs). QMPs for the Office of Criminal Enforcement, Forensics and Training (OCEFT) and its Criminal Investigation Division (CID), were submitted to the Office of Environmental Information (OEI) in July 2009 and are under review.

Data Quality Review: OCEFT's Center for Strategic Environmental Enforcement (CSEE) reviews all criminal enforcement data used for compiling performance measures by comparing data entered into the CCRS from the field offices with the final J&C order prepared by the U.S. District Court at the time a defendant is sentenced.

Data Limitations: One possible limitation on the calculation of the "recidivism" measure is the difficulty to identify all appropriate and relevant business relationships among possible repeat violators. It is possible that the information collected during a criminal prosecution may not obviously "tie" subsequent and initial violators together, especially for corporations that have multiple components or for individuals who may try to hide their ownership status of small businesses that violate the law.

The only other possible data limitation for either measure -- likely to occur only very infrequently -- is a successful appeal of convictions (that can take several years to move through the legal system) which requires a recalculation of results for a given fiscal year.

Error Estimate: Not available.

New & Improved Data or Systems: A new feature of the Criminal Case Reporting System includes a new tab that consolidates information from the Case Closing Checklist and the CCRS to incorporate data elements previously gathered through the criminal enforcement Case Conclusion Data Sheets.

References: Internal EPA database; non-enforcement sensitive data available to the public through the Freedom of Information Act (FOIA). J&C Orders available through the U.S. District Courts.

GOAL 5 OBJECTIVE 2

<u>FY 2011 Performance Measures</u>:

- **Quantity of priority chemicals reduced from all phases of the manufacturing lifecycle through source reduction and/or recycling (program assessment measure)**
- **Number of pounds of priority chemicals reduced from the environment per Federal government costs (program assessment efficiency measure)**

Performance Database: A Microsoft Access database is used to track data collected under Information Collection Request no. 2050-0190: Reporting Requirements under

EPA's National Partnership for Environmental Priorities (NPEP), renewed December 2009.

NPEP efficiency measure: The denominator of the efficiency measure, or the cost to perform such actions, equals program cost minus quantifiable benefit per pound of reduction. Program cost is calculated to be the cost for Federal program implementation (FTE + grant and contract funding). Industry cost is neutral. Quantifiable benefits include information collected through NPEP success stories on resource savings (e.g. water, energy) resulting from implementation of waste minimization technologies and processes.

Data Source: As part of their partnership agreement, NPEP partners provide information concerning what priority list chemicals they commit to reduce, the process through which the reduction/recycling will be achieved, and the time frame for completing projects. When the commitment is achieved they provide EPA with a "success story" which identifies the actual achievement, confirms the process used to achieve the reduction, and provides additional information of interest to the general public and other technical personnel concerning how the achievement was met.

Methods and Assumptions: Information is reviewed by EPA staff for reasonableness based on expertise and knowledge of the industry and/or best professional judgment. In cases where information is initially incomplete or lacks substantiation, EPA staff may conduct site visits to ensure that the commitment is reasonable.

Suitability: EPA chemical management national experts are trained in industrial or chemical engineering and have significant experience in evaluating industrial processes for chemical management potential and efficiency. Their professional judgment forms the basis for accepting the applicants' chemical management commitment and achievement.

QA/QC Procedures: All enrollment data fields are centrally tracked via a Headquarters managed Microsoft Access database. Regions have their own methods/systems for tracking data. Headquarters data are periodically reviewed by EPA Regional coordinators to ensure that they accurately reflect partner status. Corrections to the central database are made when errors are identified.

Data Quality Reviews: Information is reviewed by EPA staff for validity. In cases where information is initially incomplete or lacks substantiation, EPA staff may conduct site visits to ensure that the commitment is reasonable.

Data Limitations: The program does not have direct assurance of the data accuracy because time series measurements of partner processes and chemical management methods are not made by EPA staff.

Error Estimate: N/A.

New/Improved Data or Systems: N/A.

References: U.S. Environmental Protection Agency. Office of Resource Conservation and Recovery. Chemical Management Branch.
http://www.epa.gov/osw/partnerships/npep/index.htm (accessed December 22, 2009)
http://www.epa.gov/osw/rcc/national/toxics.htm (accessed December 22, 2009)..

FY 2011 Performance Measures:

- **Pounds of hazardous materials reduced by P2 program participants (program assessment measure)**
- **Gallons of water reduced by P2 program participants (program assessment measure)**
- **Business, institutional and government cost reduced by P2 program participants (program assessment measure)**
- **Metric tons of Carbon Dioxide Equivalent (MTCO2e) reduced, conserved, or offset by P2 program participants (program assessment measure)**

The Agency's Pollution Prevention programs include Green Chemistry (GC), Design for the Environment (DfE), Green Engineering (GE), Regional Offices, Pollution Prevention Resource Exchange (P2Rx), Environmentally Preferable Purchasing (EPP), Partnership for Sustainable Healthcare (PSH), and Green Suppliers Network (GSN). Each of these programs operates under the principles of the Pollution Prevention Act and works with others to reduce waste at the source, before it is generated. The programs are designed to facilitate the incorporation of pollution prevention concepts and principles into the daily operations of government agencies, businesses, manufacturers, nonprofit organizations, and individuals.

Performance Database:
Green Chemistry (GC): EPA has developed an electronic metrics database ("matrix") that allows organized storage and retrieval of green chemistry data submitted to EPA on alternative feedstocks, processes, and safer chemicals. The database was designed to store and retrieve information on the qualitative and quantitative environmental benefits and economic benefits that alternative green chemistry technologies offer. The database was also designed to track the quantity of hazardous substances eliminated as well as water and energy saved through implementation of alternative technologies. Green chemistry technology nominations are received up to December 31 of the year preceding the reporting year, and it normally takes 6-12 months to enter new technologies into the database.

Design for the Environment (DfE): DfE has a spreadsheet for all of its programs (i.e., Alternatives to Lead Solder in Electronics, Furniture Flame Retardant Alternatives, the Formulator Program, the Safer Detergents Stewardship Initiative (SDSI), and Auto Refinishing. The spreadsheet content varies by project, and generally includes measures comparing baseline technologies or products to safer ones, as well as information on partner adoption and/or market share of safer alternatives. For example, the DfE

Formulator Program tracks the move to safer chemicals (such as pounds of chemicals of concern no longer used by partners, and conversely pounds of safer ingredients), and reductions in water and greenhouse gas emissions, where available.

Green Engineering (GE): GE will be developing an electronic database to keep track of environmental benefits of GE projects including pounds of hazardous chemicals reduced gallons of water, dollars saved, and metric tons of carbon dioxide (CO2) emissions eliminated.

Regional Offices: EPA's Regional Offices' P2 results come primarily through the grants they award, and results from direct projects managed by EPA Regional staff. Regional Offices use a standardized spreadsheet to track, manage, and report results from P2 and Source Reduction grants. End of year grant data is aggregated and made available to the public through the Pollution Prevention website. The program is actively engaged in a project to improve the collection, tracking, and reporting of P2 grant results. The project will examine end user needs and existing technologies in an effort to streamline grant reporting, and improve the transparency and overall quality of the data.

Pollution Prevention Resource Exchange (P2Rx): There are 8 regional P2 Information centers which coordinate and supply information and, training for local and state technical assistance providers and businesses. These centers report to EPA through grant reports and host regional modules that contribute to the National P2 Results system. The P2RX centers have trained and assisted organizations in entering their data. Any program can enter measures of outputs and outcomes into this data system. Over 30 state-level P2 organizations have signed Memoranda of Agreements to provide data.

Partnership for Sustainable Healthcare (PSH) Program: The Partnership for Sustainable Healthcare (PSH) program is the new name for EPA's continued effort with the health care sector, as the former "Hospitals for a Healthy Environment" (H2E) program (now the Practice Green Health (PGH), a fully independent non-profit organization.). In FY 2008, EPA's financial relationship with PGH ended, so new results will not be counted. 2004-2007 results will reoccur with 2011 being the last year any results will be counted.

Green Suppliers Network (GSN): GSN utilizes a Customer Relationship Management database (CRM) in partnership with the National Institute of Standards and Technology's Manufacturing Extension Partnership Program (NIST MEP) to collect performance metrics for the program. The CRM collects economic information and environmental metrics such as the value of environmental impact savings identified, energy and water conserved, water pollution reduced, air emissions reduced, hazardous waste reduced (lbs/year), and toxic/hazardous chemical use reduced (lbs/year). In collaboration with the Department of Energy, Department of Commerce, Department of Labor, and the Small Business Administration, we will work to ensure that the economic and environmental benefits are clearly demonstrated.

Environmentally Preferable Products (EPP): Results for Environmentally Preferable Purchasing (EPP) come from the Federal Electronics Challenge (FEC), and the Electronic Product Environmental Assessment Tool (EPEAT). FEC uses the FEC Administrative Database for storage and retrieval of annual reporting information from FEC partners. EPP staff run these reporting data through the Electronics Environmental Benefits Calculator (EEBC) to calculate pounds of hazardous pollution reduced, units of energy conserved, and costs saved (among other benefits) on an annual basis. Manufacturers of EPEAT registered products provide collective data on annual sales of EPEAT-registered products to the Green Electronics Council (GEC). The EPP team obtains this data from the GEC, runs these sales data through the EEBC to calculate pounds of hazardous pollution reduced, units of energy conserved, and costs saved (among other benefits) on an annual basis. FY 2010 data will be collected for the FEC in January 2011 and for EPEAT in April 2011.

Data Sources: *GC:* Industry and academia sponsors submit nominations annually to the Office of Pollution Prevention and Toxics (OPPT) in response to the annual Presidential Green Chemistry Challenge Awards. Environmental and economic benefit information is included in the nomination packages. Qualitative and quantitative benefit information is pulled from the nominations and entered in the metrics database.

DfE: The source of DfE's evaluation information varies by the project. For example, in DfE's Formulator Recognition Program, partners provide proprietary information on the production volume of their improved formulations. For other partnerships, data sources typically include technical studies (e.g., Alternatives Assessments and Life-Cycle Assessments) and market/sales/adoption information from sources such as industry associations and materials/equipment suppliers. For SDSI GHGs, industry partners will provide data on the amount of GHG emissions reduced through partner activities.

GE: Data come from sources and partners including the regions, academia and industry. For example, for the GE activites related to the pharmaceutical industry, data will be supplied by individual companies or sites and other partners from the regions and academia. A pilot project with Region 2 and Pharmaceutical operating facilities and members of the Puerto Rico Manufacturer's Association will apply GE practices and measure their process changes through a GlaxoSmithKilne/North Carolina State University (GSK-NCSU) model.

Regional Offices: P2 Grant and Source Reduction grant data are secured from grant applications, grant semi-annual and final reports and sub-grantee and facility level performance information.

P2Rx: P2Rx centers report their outputs and outcomes in grant reports and assist State and Local program reporting through the regional modules of the P2 Results system. The centers conduct web-based surveys of customers, pre and post testing of training audiences and follow up services provided with customer satisfaction surveys. The centers evaluate long term impact of their services and information using case studies.

PSH: Because the PSH program is a voluntary program, the information collected is voluntarily submitted by hospital Partners to PGH, which provides the information to PSH.

GSN: Data are collected by the GSN Review Team during a GSN review at the company's facility. This team consists of a "lean" manufacturing expert from the NIST MEP system and an environmental expert usually from the state environmental agency or its designee. The metrics are recorded in the final report generated for the company's use and also are entered into the CRM database by the NIST MEP center. All MEP centers are grantees to the Department of Commerce and must adhere to DOC's requirements for the collection and handling of data. These requirements are reinforced by the terms of the "Request for Proposals" to which each center (e.g., grantee) responds and which must be followed during a GSN review.

EPP: For FEC, the data source is federal partners. For EPEAT, the data source is manufacturers of EPEAT registered electronic products.

Methods and Assumptions: *GC:* The information from the nominations is collected and tracked directly through internal record-keeping systems. The performance data, while collected by individual centers, is acceptable performance measurement for the program, as it addresses the specific measures and reflects an aggregated and quality reviewed dataset.

DfE: Each DfE partnership identifies and focuses on a unique set of chemicals and industrial processes. For DfE's Formulator Recognition Program, partner-provided data on production volumes is aggregated to determine the total reductions of hazardous chemicals achieved through the program. For Lead-Free Solder and Furniture Flame Retardants, market data for the production volume of the chemical of concern provides the measure for reduction. DfE's Data Program Tracking Spreadsheet includes the methods/assumptions for each project's measures. For SDSI GHGs, partner-provided data on GHG emissions reductions will be aggregated to determine the total reduction in GHG emissions achieved through the program.

GE: The information (e.g. solvent stream data) will be supplied by individual companies or sites and/or other partners from the regions or academia. The GSK/NCSU models will utilize input information from pilot companies to calculate environmental benefits. The pilot companies, in collaboration with the GSK/NCSU model developers and the GE program will also collectively review these materials for any information that could be used as business case studies and other resource materials.

Regional Offices: No models, assumptions, or statistical methods are employed with Regional data. Grantees use a variety of methodologies in collecting their data. However, the program now requests grantees to include descriptions of the methodologies and assumptions behind the grant results which will increase consistency in data collection.

P2Rx: Data reported by state and local technical assistance programs in the National P2 Results system is collected and compiled by the regional centers. EPA grant support of these regional centers contributes to national P2 progress by providing an infrastructure of P2 information and training. To capture this indirect effect of EPA's role, 10% of the results reported through the National P2 Results system counted in EPA performance measures.

PSH: The data come from program Partner hospitals through PGH. No models or assumptions or statistical methods are employed.

GSN: The data are aggregated by NIST MEP headquarters and reported to EPA on a quarterly basis in September, December, March, and June. The data are aggregated to maintain confidentiality for all companies participating in the program. No models or statistical methods are employed.

EPP: For FEC, the program assumes that partners report accurate data. For EPEAT, the program assumes that manufacturers report accurate annual sales data, and that the GEC accurately reports this data to the EPEAT program. The assumptions needed for the EEBC to translate environmental attributes and activities into environmental benefits are relatively extensive and are laid out in the EEBC (e.g., the average lifecycle of a computer, the weight of packaging for a computer, etc.). The assumptions were reviewed when the EEBC underwent the original peer review process, and were reviewed and updated during the development of version 2.0 of the EEBC.

In September 2008, the P2 program went to the Science Advisory Board for a consultation on the issue of recurring results[1]. Based on their feedback[2], the P2 program has determined that it is appropriate to count recurring results but only for a pre-defined amount of time (i.e. not indefinitely). Each P2 program has made a determination for an appropriate and reasonable timeframe to count the recurring benefits of program intervention. These timeframes may differ by program, but each program will consistently adhere to the timeframes described below. Every reporting year, each program breaks out new annual results and adds them to recurring results form previous years efforts to report the annual rate of performance for that year. The recurring-results timeframe for each program is described below. These timeframes are inclusive of first year results.

The EPP program derives benefits from the purchase, use, and disposal of green electronics products. Currently, results are counted over a 5 year product life-cycle. As additional electronics products are explored, benefits will be counted according to respective product life-cycles. The Green Chemistry captures benefits from innovative green chemistry technologies and related processes. Because of the relatively slow innovation rate and long life-span of technologies once adopted, the Green Chemistry

---

[1]http://yosemite.epa.gov/sab/SABPRODUCT.nsf/3F4214C1239651BC852574AD003FC2F0/$File/Charge+for+Pollution+Prevention+Program+Measures+9-3-08+Meeting.pdf

[2] http://yosemite.epa.gov/sab/sabproduct.nsf/F6A39F03493E4EA38525750C0074E448/$File/EPA-SAB-09-005-unsigned.pdf

program generally counts results over a 10 year timeframe. However, in cases where new public information becomes available, benefits for award-winning technologies are updated. For example, if a technology is withdrawn from the market that quantity is no longer counted. Similarly, if news of an increased benefit because of increased market penetration becomes available, the magnitude of the benefit is increased to reflect that change. The Green engineering program is promoting implementation of solvent reuse and recovery practices in pharmaceutical companies. These actions result in both environmental and economical benefits and will be recurring as facilities will not revert back to former, less economical practices. These results will be counted for 8 years until these practices become standard operating practice. The Design for the Environment program has many different projects that generate results. The largest of these, the Formulator Program, is set up to recognize safer products through application of the DfE label. Partner companies sign a three-year partnership agreement so these results will be counted over 3 years. The DfE Automotive Refinishing Partnership collaborates with the Regions on training and compliance assistance workshops that help businesses and schools implement best practices to reduce air toxics in the workplace and community. Changes are counted over a 5 year period to account for the time it takes to provide training and equipment, improve performance, and standardize new processes. DfE's Furniture Flame Retardancy Partnership and Lead-Free Solder LCA will count results for 7 years. This period was chosen to be consistent with the Modified Accelerated Cost Recovery System (MACRS) recovery period for similar product types[3]. DfE's SDSI GHG will count recurring results for three years. The period was chosen because SDSI GHG Champions will also have DfE Formulator Program recognition, where results are counted for three years. Regions count recurring results from grant-based and direct project based P2 technology and practice changes because these changes are expected to endure multiple years. The Program is using an average lifetime of equipment, process, or practice changes as a factor to apply to all results achieved. The Program has conducted preliminary bench-marking to ascertain the range of standard expected lifetimes of the technologies and practices adopted as a result of Regional action. The range is wide, and documentation of results varies depending on the nature of the grant activity. As a result, the Program is using a conservative 4 year period for an average duration of these technology and practice changes. The P2Rx Center is counting recurring results and is also using an average lifetime of equipment, process, or practice changes as a factor to apply to all results achieved. Due to the aggregated nature of results reported in the P2 Results Data System, and the relative lack of transparency concerning the underlying activities reported in this system, the Program is taking the most conservative approach and counting results for 2 years. EPA's financial relationship with Practice Green Health ended in FY 2007 and no new results are being collected beyond FY 2007. 2004 through 2007 data will be counted for 5 years because hospitals are greening their operations and equipment on a facility basis. These improvements result in financial gains and are unlikely to be reversed in future years. The Green Suppliers Network counts recurring results from facility implementation of equipment and process changes that are expected to endure multiple years. GSN is using an average lifetime of equipment or process change as a factor to apply to all results achieved.

---

[3] [1]Couper, J.R., *Process Engineering Economics*.2003, New York: Marcel Dekker, Inc. 423. (see page 180)

Preliminary bench-marking indicates that a 6-year period is an appropriate average lifetime for GSN technology and process changes. In the future, the Center may be able to access case-specific data efficiently to determine specific depreciation rates for equipment and process changes installed.

Suitability: Hazardous pounds reduced, dollars saved, gallons of water and metric tons of carbon dioxide reduced represent the four Pollution Prevention measures. These annual measures have corresponding long term goals identified in EPA's draft 2009-2014 strategic plan and are suitable for year to year comparisons due to the program's ability to show annual progress towards reaching these long term goals.

QA/QC Procedures: All Pollution Prevention and Toxics programs operate under the Information Quality Guidelines as found at http://www.epa.gov/quality/informationguidelines, as well as under the Pollution Prevention and Toxics Quality Management Plan (QMP) ("Quality Management Plan for the Office of Pollution Prevention and Toxics; Office of Prevention, Pesticides and Toxic Substances," November 2008), and the programs will ensure that those standards and procedures are applied to this effort. The Quality Management Plan is for internal use only.

GC: Data undergo a technical screening review by the Agency before being uploaded to the database to determine if the data adequately support the environmental benefits described in the Green Chemistry Challenge Awards application. Subsequent to Agency screening, nominations are reviewed by an external independent panel of technical experts from academia, industry, government, and nongovernmental organizations (NGOs). Their comments on potential benefits are incorporated into the database. The panel is convened by the Green Chemistry Institute of the American Chemical Society, primarily for judging nominations submitted to the Presidential Green Chemistry Challenge Awards Program and selecting winning technologies. Quantitative benefits are periodically reviewed to be sure they were accurately captured from the nominations.

DfE: Data undergo a technical screening review by DfE before being added to the spreadsheet. DfE determines whether data submitted adequately support the environmental benefits described.

GE: Data will be reviewed by the partners including industry, academia, and the regions. Data will also be reviewed by GE HQ and Regional staff to ensure transparency, reasonableness and accuracy. For the pharmaceutical project, data will be internally reviewed by companies and may also be reviewed by model developers. It is an essential goal and foundation for this project that this information is transparent, verifiable and within the public domain.

Regional Offices: Data will undergo technical screening review by EPA Regional and Headquarters staff before being entered into an aggregate reporting spreadsheet. Data for projects managed directly by EPA Regional staff will be reviewed by Regional personnel. Additional QA/QC steps are to be developed through the use of standard

operating procedures. Also, the program has been working with the Regional offices to develop consistent QA procedures, which can be applied at the beginning of the grant and throughout the life of the grant. For instance, a Quality Assurance Project Plan (QAPP)-lite guidance was developed and is now in use in several Regional offices.

P2Rx: The P2Rx centers follow Quality assurance project plans for their grants and have established standard operating procedures for development of web site statistics and information products. SOPs are on this web site: http://www.p2rx.org/AdminInfo/toc.cfm Data entered into the National P2 Results system will undergo technical screening review by P2Rx centers and EPA regional and Headquarters staff. The users guide for the P2 Results system is posted on the Internet: http://www.p2rx.org/measurement/info/FINAL_user_guide.pdf

GSN: Data are collected and verified under NIST MEP's QA/QC plan. Each NIST MEP Center must follow QA/QC requirements as grantees to the Department of Commerce. Additionally, the environmental data are collected under the specific requirements of the state environmental agency participating in each GSN review. Each state agency utilizes their own QA/QC plan for data collection because they utilize the data for purposes in addition to the GSN program.

EPP: The EEBC underwent internal and external review during their development phases. The EEBC was also reviewed and beta-tested during the development of version 2.0. For FEC, instructions and guidelines are provided to partners on how to report data. Reporting forms are reviewed by EPA staff when they are submitted. For EPEAT, manufacturers of EPEAT-registered products sign a Memorandum of Understanding in which they warrant the accuracy of the data they provide.

Data Quality Review: OPPT has developed an official response to OIG recommendations published in their January 2009 report "Measuring and Reporting Performance Results for the Pollution Prevention Program Need Improvement." Overall, the report found the program deserving of its initial Moderately Effectively program program assessment rating and includes recommendations such as developing additional and refining existing measures, establishing more comprehensive QA/QC procedures, and addressing improvement opportunities.

Data Limitations:

GC: Nominations for the Presidential Green Chemistry Challenge Awards Program are in the public domain. As a result, nominees are often reluctant to include proprietary information on cost differences or other quantitative benefits. Because the Presidential Green Chemistry Challenge is a voluntary, public program, it cannot routinely accept or process CBI. If the program stakeholders feel they need additional information during the judging for the awards program, they can and do ask EPA to request additional information from the nominee. EPA will then ask the company to share confidential information with CBI-cleared OPPT staff in order for EPA to conduct the verification.

Often technologies are nominated before or soon after they become commercially available. Implemented benefits (those that have occurred due to the adoption of the nominated technology) are counted separately from potential benefits that may occur upon future adoption of the technology.

DfE: Occasionally, data on innovative chemistries or technologies are claimed CBI by the developing company, thus limiting the implementation of beneficial pollution prevention practices on a wider scale.

GE: There may be instances in which submitted data is not clearly quantified and/or available due to various reasons such as CBI. However, efforts will be made to minimize CBI information in working with the facilities to have more generic case studies. In these instances, the data have to be carefully evaluated and considered for reporting.

Regional Offices: Limitations arise from the reliance on data source information provided by individual state and other P2 grantees. These programs vary in attention to data collection from sources within their jurisdictions, data verification and other QA/QC procedures. The program expects to develop standard operating procedures for the collection and management of grant results.

P2Rx: Limitations arise from variability in individual state and local P2 programs and their reporting sources, QA/QC procedures, and what is reported. Differences may arise in how programs quantify environmental benefits, based on state or local legislative requirements.

GSN: Limitations arise from the reliance on individual programs to gather data. These programs vary in attention to data collection from sources within their jurisdictions, data verification and other QA/QC procedures. The GSN program has attempted to address these concerns by strengthening the data collection requirements in the Request for Proposals that MEP centers must be respond to in order to perform a GSN review.

EPP: FEC has a built-in reliance on partners for data reporting. EPEAT relies on manufacturers of EPEAT-registered products, and the GEC, for data reporting.

Error Estimate:

Statistical approaches are generally not used across the program and therefore error estimates are not available.

New/Improved Data or Systems:
A new greenhouse gas calculator was developed to capture greenhouse gas reduction from a wide range of on-the-ground activities including: electricity conservation; renewable energy and green power; fuel specific reductions and substitutions, chemical specific reductions and substitutions, as well as process change resulting in reduced electricity usage.

DfE: DfE has implemented an emissions calculator for the DfE Automotive Refinishing Partnership. The emissions reduction calculator computes individual or aggregate quantities of toxics eliminated and cost savings based on annual material usage (e.g. gallons of paint) before and after a business switches to best practices or safer alternative paint products. SDSI GHGs will be a new set of results for DfE in FY 2011. This program will focus on encouraging products that reduce the release of GHG emissions

Regional Offices: The program's system for estimating and reporting outcome results has been substantially improved with the development of new calculators, tools, and clearer methodologies contained in the P2 measurement guidance. The program designed a P2 cost calculator to improve the process of projecting and reporting results related to cost savings.

P2Rx: Currently the centers are developing tracking and user identification approaches to better characterize the customers using their web site information. The centers currently track customers served through phone calls, emails, trainings and evaluate changes in awareness, knowledge, and behavior resulting from their services. Standard operating procedures for these approaches are being developed.

GE: The program is utilizing GlaxoSmithKline/North Carolina State University GSK/NCSU models (Jimenez-Gonzalex C, Overcash MR and Curzons AD. J. Chemistry Technology Biotechnology. 71:707-716 (2001) and plans to combine these models with OPPT tools such as ChemSTEER to accurately utilize inputs from pharmaceutical companies in the estimation of environmental benefits.

EPP: The EEBC is was revised and version 2.0 was released in March 2009. These revisions were made to ensure that the EEBC reflects the best available data related to EPEAT-registered and ENERGY STAR-qualified products; and to add additional functionality to the EEBC. A complete list of revisions is available in the EEBC and it is currently being converted from an Excel spreadsheet to a Web-based tool, to make it more user friendly.

References:

GC: http://www.epa.gov/opptintr/greenchemistry/ *DfE*: http://www.epa.gov/opptintr/dfe/
GE: http://www.epa.gov/opptintr/greenengineering/ *P2 Programs*:
http://www.epa.gov/oppt/p2home/index.htm ,
http://www.p2.org/workgroup/Background.cfm
http://www.epa.gov/Networkg/ *PSH:* http://www.epa.gov/p2/pubs/psh.htm
GSN: www.greensuppliers.gov *EPP*: Information about FEC's annual reporting is on the FEC web site at: http://www.federalelectronicschallenge.net/report.htm Information about the EEBC is on the FEC web site at:
http://www.federalelectronicschallenge.net/resources/bencalc.htm

The EPEAT Subscriber and License Agreement is available on the EPEAT web site at: http://www.epeat.net/docs/Agreement.pdf Regional*:*
http://www.epa.gov/p2/pubs/local.htm
P2RX: P2 Results user guide:
http://www.p2rx.org/measurement/info/FINAL_user_guide.pdf
SOPs for P2RX centers: http://www.p2rx.org/AdminInfo/toc.cfm

FY 2011 Performance Measure:

- **Annual reductions of Design for the Environment (DfE) chemicals of concern per federal dollar invested in the DfE program (program assessment efficiency measure)**

EPA measures the accomplishments of the Design for the Environment (DfE) Program by comparing reductions in hazardous chemicals achieved to program resources, including FTE, overhead and extramural dollars spent.

Performance Database: The DfE program has an evaluation spreadsheet that is populated for all its programs (i.e., Alternatives to Lead Solder in Electronics, Furniture Flame Retardant Alternatives, the Formulator Program, the Safer Detergents Stewardship Initiative (SDSI), and Auto Refinishing). Key data elements used to calculate the efficiency measure are the quantity of hazardous chemicals reduced and spending information obtained from the OPPT Finance Central database. The efficiency measure numerator is the total pounds of hazardous chemicals reduced and the denominator is the annual DfE program resources expended.

Data Source: The source of DfE's evaluation information varies by the project and the partner industry. For example, in DfE's Formulator Recognition Program, partners provide proprietary information on the production volume of their improved formulations. For other partnerships, data sources typically include technical studies (e.g., Alternatives Assessments and Life-Cycle Assessments) and market/sales/adoption information from sources such as industry associations. Resource data are from OPPT Finance Central

Methods, Assumptions: Each DfE partnership identifies and focuses on a unique set of chemicals and industrial processes. For DfE's Formulator Recognition Program, partner-provided data on production volumes are aggregated to determine the total reductions of hazardous chemicals achieved through the program. For Lead-Free Solder and Furniture Flame Retardants, market data for the production volume of the chemical of concern provide the measure for reduction. DfE's Data Program Tracking Spreadsheet includes the methods/assumptions for each project's measures. Program resources are calculated directly from EPA figures. The efficiency measure corresponds directly to the program goal of cost-effectively reducing hazardous chemical use and can compare cost effectiveness year–to-year.

Suitability: Hazardous pounds reduced is one of four Pollution Prevention annual measures which have corresponding long term goals identified in EPA's draft 2009-2014 Strategic Plan and are suitable for year to year comparisons due to the program's ability to show annual progress towards reaching the long term goals. This measure is suitable because reductions in cost per pound of hazardous chemicals reduced are expected to result from improvements in program implementation. These cost reductions will enable EPA to achieve the goals of the Design for the Environment program with greater efficiency.

QA/QC Procedures: Design for the Environment operates under EPA's Information Quality Guidelines as found at http://www.epa.gov/quality/informationguidelines and under the OPPT Quality Management Plan.

Data Quality Reviews: Data undergo a technical screening review by DfE staff before being added to the program tracking spreadsheet.

Data Limitations: The data submitted voluntarily by partners are confidential. The information made public is limited to aggregated values.

Error Estimate: Due to the sampling methodology, no error estimate is possible.

New/Improved Data or Systems: Each year additional data are added to the program tracking spreadsheet and averaged with preceding years.

References:
http://www.epa.gov/quality/informationguidelines

The DfE Program Tracking Spreadsheet contains Confidential Business Information.

FY 2011 Performance Measures:

- **Energy savings per dollar invested in the Federal Electronics Challenge (FEC) program. (program assessment efficiency measure)**

Performance Database:
FEC uses the FEC Administrative Database for storage and retrieval of annual reporting information from FEC partners. FEC partners report the number of EPEAT gold silver and bronze registered products purchased; the number of computer products with power savings features turned on; and the number of computer products reused, recycled, and disposed of, through standardized reporting forms available at: http://www.federalelectronicschallenge.net/report.htm and submitted through an online, password-protected web site. The environmental benefits of these reported activities are then calculated by EPA staff by running summary data from submitted partner forms through the Electronics Environmental Benefits Calculator (EEBC) to calculate BTUs of

energy reduced, conserved, or offset on an annual basis. Spending information is obtained from the OPPT Finance Central database.

Data Sources
For FEC, the data source is federal partners who fill out reporting forms online through a web-system with built in error checking. Partners report data at the facility level as opposed to the Agency level. There are hundreds of participating federal facilities spread across dozens of federal Agencies. Participating federal facilities are required to submit the reporting form, annually as part of their partnership. Some agencies further require their facilities to submit the FEC reporting form as part of their implementation of Executive Order 13423 which seeks to make federal environmental, energy and transportation management more sustainable. Financial resource data are obtained from from OPPT Finance Central database.

Methods and Assumptions:
The Federal Electronics Challenge program assumes that partners report accurate data. However, FEC data undergoes thorough internal technical review before these data are run through the EEBC. EPA staff provides guidance and technical assistance to partners in filling out reporting forms.

The assumptions needed for the EEBC to translate environmental attributes and activities into environmental benefits are relatively extensive and are laid out in the EEBC (e.g., the average lifecycle of a computer, the weight of packaging for a computer, etc.). The assumptions were reviewed when the EEBC underwent the original peer review process, and were reviewed and updated during the development of version 2.0 of the EEBC.

EPA measures the efficiency of the Federal Electronics Challenge by comparing reductions of BTUs of energy achieved to program resources, including FTE, overhead and extramural dollars spent. The efficiency measure numerator is the annual BTUs of energy conserved, reduced, or offset and the denominator is the annual FEC program resources expended. The unit of measurement is expressed as Million BTUs per dollar.

Suitability: The indicators used for this measure are suitable because reductions in cost per million BTUs of energy reduced are expected to result from improvements in program implementation such as improved outreach and coordination efforts to federal partners. These cost reductions will enable EPA to achieve the goals of the Federal Electronics Challenge with greater efficiency.

QA/QC Procedures: All Pollution Prevention and Toxics programs operate under the Information Quality Guidelines as found at http://www.epa.gov/quality/informationguidelines, as well as under the Pollution Prevention and Toxics Quality Management Plan (QMP) ("Quality Management Plan for the Office of Pollution Prevention and Toxics; Office of Prevention, Pesticides and Toxic Substances," November 2008), and the programs will ensure that those standards and procedures are applied to this effort. The Quality Management Plan is for internal use only.

Data Quality Review: All Office of Pollution Prevention and Toxics (OPPT) programs operate under EPA's Information Quality Guidelines as found at http://www.epa.gov/quality/informationguidelines and under the OPPTS's Quality Management Plan (QMP).

For FEC, data are entered on-line with an additional error-checking function on the online form. FEC staff also review the data to ensure that it is sensible, given the context.

Data Limitations:
FEC has a built-in reliance on partners for data reporting.

Error Estimate:
Statistical approaches are generally not used and therefore error estimates are not available.

New/Improved Data or Systems:
The EEBC was revised by EPA and version 2.0 was released in March 2009. These revisions are intended to ensure that the EEBC reflects the best available data related to EPEAT-registered and ENERGY STAR-qualified products; and to add additional functionality to the EEBC. A complete list of revisions is available in the EEBC, and it is also being converted from an Excel spreadsheet to a Web-based tool, to make it more user-friendly.

References:
EPP: Information about FEC's annual reporting is on the FEC web site at:
http://www.federalelectronicschallenge.net/report.htm

GOAL 5 OBJECTIVE 3

<u>FY 2011 Performance Measures:</u>

- **Percent of tribes implementing federal regulatory environmental programs in Indian country. (Strategic Target & program assessment measure)**
- **Percent of tribes conducting EPA-approved environmental monitoring and assessment activities in Indian country. (Strategic Target & program assessment measure)**
- **Percent of tribes with an environmental program. (Strategic Target & assessment measure)**
- **Number of environmental programs implemented in Indian country per million dollars. (program assessment efficiency measure)**

Performance Database: EPA's American Indian Environmental Office (AIEO) has a suite of secure Internet-based applications that track environmental conditions and program implementation in Indian country as well as other AIEO business functions. One application, the Tribal Program Management System (TPMS), tracks progress in

achieving the performance targets under Goal 5 Objective 3 of EPA's 2009-2014 Strategic Plan – "Improve Human Health and the Environment in Indian Country" and other EPA metrics. EPA staff use TPMS to establish program performance commitments for future fiscal years and to record actual program performance for overall national program management. The system serves as the performance database for all of the strategic targets, annual performance measures and program assessment measures.

Data Source: Data for the TPMS are input on an ongoing basis by Regional tribal programs and EPA headquarters.

The original documents for the statements and data entered into the fields of the TPMS can be found in the files of the Regional Project Officers overseeing the particular programs that are being reported on. For example, documents that verify water quality monitoring activities by a particular tribe will be found in the files of the Regional Water 106 Project Officer for the tribe.

The performance measure, "Percent of tribes implementing Federal regulatory environmental programs in Indian country" tracks the number of "Treatment in a manner similar to a State" (TAS) program approvals or primacies and execution of "Direct Implementation Tribal Cooperative Agreements (DITCAs)" that are active during the fiscal year. The measure is based on a count of tribes, and a given tribe may have more than one TAS program, and may have DITCAs as well. Because of the tribes with multiple qualifying programs, the total number of TAS designations plus DITCAs in Indian country is higher than the number of tribes with regulatory environmental programs as reported for this measure. The data are reported by the Regions at mid-year and at the end of the year.

The performance measure, "Percent of tribes conducting EPA-approved environmental monitoring and assessment activities in Indian country," reports the number of Quality Assurance Project Plans (QAPPs) for monitoring activities that have been approved by Regional Quality Assurance Officers, and active during the fiscal year. All ongoing environmental monitoring programs are required to have active QAPPs, so QAPPs are used as a surrogate for the monitoring activities that occur in Indian country. However, tribes often have more than one QAPP, so the count of total QAPPs is always higher than the performance measure which counts the tribes that have QAPPs. Regional tribal program liaisons obtain information from Regional Quality Assurance Officers and input data into the TPMS. The data are updated and reported on during mid-year and at the end of each fiscal year.

The performance measure, "Percent of tribes with an environmental program," counts tribes that have an EPA-funded environmental office and/or coordinator staffed in the current fiscal year and that also demonstrate environmental program activities by having completed at least one of the following indicators:

- completed a Tier III Tribal Environmental Agreement (TEA) that specifies actions by EPA and the Tribe, and includes monitoring, as evidenced by a document signed by the tribal government and EPA;

- established environmental laws, codes, ordinances or regulations as evidenced by a document signed by the tribal government;
- completed solid and/or hazardous waste implementation activities; or
- a completed inter-governmental environmental agreement (e.g. State-Tribal Memorandum of Agreement (MOA), Federal-Tribal MOA).

The environmental program measure thus requires two steps, the establishment of an environmental office and the completion of an indicator activity. EPA Regional project officers managing tribes with an environmental program, input data, classified by tribe, into the TPMS, to derive a national cumulative total. Data are input at mid-year, and again at the end of the year.

The performance measure, "Number of environmental programs implemented in Indian country per million dollars," is calculated annually by AIEO staff summing the number of tribes receiving General Assistance Program (GAP) grants, the number of TAS approvals or primacies, the number of DITCAs, and the number of GAP grants that have provisions for the implementation of solid or hazardous waste programs, all active during the fiscal year, and dividing that sum by the annual GAP appropriation (less rescissions and annual set-asides). Some tribes have multiple environmental programs, and these programs are counted individually.

Methods and Assumptions: TPMS contains all the information for reporting on AIEO performance measures and program assessment measures. The information is entered into standard query fields in the data system. Thus, there is no allowance for differences in reporting across EPA's Regional offices, and national reports can be assembled in a common framework. The assumption is that the authorized person who enters the data is knowledgeable about the performance status of the tribe.

Suitability: These measures represent progression toward the goal of improving human health and the environment in Indian country by helping tribes plan, develop and establish environmental protection programs.

QA/QC Procedures: The procedures for collecting and reporting on the Goal 5 Objective 3 performance measures require that program managers certify the accuracy of the data submitted by the regions to AIEO. This certification procedure is consistent with EPA Information Quality Guidelines (See http://www.epa.gov/quality/informationguidelines/index.html for more information.)

Data Quality Reviews: The official who certifies information in TPMS, submitted by EPA's Regional offices to AIEO, is the Regional Administrator. However, in some cases the Regional Administrator may wish to delegate the signatory authority to another official such as the Regional Indian Coordinator. This procedure generally follows guidance provided in EPA Information Quality Guidelines. (See http://intranet.epa.gov/ocfo/policies/iqg/index.html for more information.)

Data Limitations: Because data are input by EPA's Regional Project Officers on an ongoing basis, there may be a time lag between when a tribal program status has been achieved and when the data are entered into the TPMS. Even though the Regional Project Officer may enter data on an ongoing basis, at the end of the reporting cycle the TPMS will be "locked down," with the locked dataset reported for the fiscal year. EPA's Regional Administrator certifies the accuracy of the locked information.

Error Estimate: For the TPMS, errors could occur by mis-entering data or neglecting to enter data. However, the data from each region will be certified as accurate at the end of each reporting cycle; error is estimated to be low, about 1-2 percent.

New/Improved Data or Systems: TPMS was reprogrammed in 2010. It now calculates and reports the three tribal measures for PAR, the SMM 5.3TR measure and the GAP Efficiency measure on an ongoing basis. The data are reported per year.

References:
Tribal Program Management System: https://iaspub.epa.gov/TATS/
OCFO Information Quality Guidelines: http://intranet.epa.gov/ocfo/policies/iqg/index.html

GOAL 5 OBJECTIVE 4

<u>FY 2011 Performance Measure:</u>

- **Percentage of planned outputs delivered in support of STS's goal that decision makers adopt ORD-developed decision support tools and methodologies (program assessment measure).**
- **Percentage of planned outputs delivered in support of STS's goal that decision makers adopt ORD-identified and developed metrics to quantitatively assess environmental systems for sustainability (program assessment measure).**
- **Percentage of planned outputs delivered in support of STS's goal that decision makers adopt innovative technologies developed or verified by ORD (program assessment measure).**

Performance Database: Integrated Resources Management Systems (internal database) or other internal tracking system.

Data Source: Data are generated based on self-assessments of completion of planned program outputs.

Methods, Assumptions and Suitability: To provide an indication of progress towards achievement of a program's long-term goals, each program annually develops a list of key research outputs scheduled for completion by the end of each fiscal year. This list is finalized by the start of the fiscal year, after which no changes are made. The program then tracks quarterly the progress towards completion of these key outputs against pre-

determined schedules and milestones. The final score is the percent of key outputs from the original list that are successfully completed on-time.

QA/QC Procedures: Procedures are now in place to require that all annual outputs be clearly defined and mutually agreed upon within ORD by the start of each fiscal year. Progress toward completing these activities is monitored by ORD management

Data Quality Reviews: N/A

Data Limitations: Data do not capture the quality or impact of the research outputs being measured. However, long-term performance measures and independent program reviews are used to measure research quality and impact. Additionally, completion rates of research outputs are program-generated, though subject to ORD review.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: Sustainability Research Stragegy, available at http://www.epa.gov/sustainability/pdfs/EPA-12057_SRS_R4-1.pdf (last accessed August 21, 2008)

FY 2011 Performance Measure:

- **Percent variance from planned cost and schedule (program assessment efficiency measure)**

Performance Database: Integrated Resources Management System (internal database).

Data Source: Data are generated based on 1) self-assessments of progress toward completing research goals, and 2) spending data.

Methods, Assumptions and Suitability: Using an approach similar to Earned Value Management, the data are calculated by: 1) determining the difference between planned and actual performance for each long-term goal (specifically, determining what percent of planned program outputs were successfully completed on time), 2) determining the difference between planned and actual cost for each long-term goal (specifically, determining the difference between what the program actually spent and what it intended to spent), and 3) dividing the difference between planned and actual performance by the difference between planned and actual cost.

QA/QC Procedures: N/A

Data Quality Reviews: N/A

Data Limitations: Program activity costs are calculated through both actual and estimated costs when activities are shared between programs. Performance data reflects only the key program outputs, and does not include every activity completed by a program. Additionally, completion rates of research outputs are program-generated, though subject to ORD review.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: N/A

FY 2011 Performance Measures:

- **Percentage of Science and Technology for Sustainability (STS) publications rated as highly cited publications (program assessment measure).**
- **Percentage of Science and Technology for Sustainability (STS) publications in "high impact" journals (program assessment measure).**

Performance Database: No internal tracking system.

Data Source: Searches of Thomson Scientific's *Web of Science* and *Scopus* are conducted to obtain "times cited" data for programs' publications. Analyses are completed using Thomson's *Essential Science Indicators (ESI)* and *Journal Citation Reports (JCR)* as benchmarks. *ESI* provides access to a unique and comprehensive compilation of essential science performance statistics and science trends data derived from Thomson's databases.

Methods, Assumptions and Suitability: For influence and impact measures, *ESI* employs both total citation counts by field and cites per paper scores. The former reveals gross influence while the latter shows weighted influence, also called impact. *JCR* is a recognized authority for evaluating journals. It presents quantifiable statistical data that provide a systematic, objective way to evaluate the world's leading journals and their impact and influence in the global research community. The two key measures used in this analysis to assess the journals in which a program's papers are published are the Impact Factor and Immediacy Index. The Impact Factor is a measure of the frequency with which the "average article" in a journal has been cited in a particular year. The Impact Factor helps evaluate a journal's relative importance, especially when compared to other journals in the same field.

QA/QC Procedures: N/A

Data Quality Reviews: N/A

Data Limitations: Analyses do not capture citations within EPA regulations and other key agency documents.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References: Bibliometric Analysis for the U.S. Environmental Protection Agency/Office of Research and Development available at:
http://www.epa.gov/ncer/publications/bibliometrics/index.html

ENABLING SUPPORT PROGRAMS

FY 2011 Performance Measure:

- **Percent of GS employees hired within 80 calendar days. (Goal is 60 percent)**

Performance Database: EPA's Human Resources Activity and Communication Tracking System (HRACTS) is an in-house, lotus-notes based system designed to track and monitor HR workload including recruitment actions at the Agency's Shared Service Centers. HRACTS also tracks other HR workload activity including awards, reassignment, etc.; tracks EPA's status towards achieving OPM's original 45-day hiring goal; and provides status reports to customers. The servicing human resources personnel at EPA's 3 Shared Service Center enter data into the system. This data is tracked internally and reported on a fiscal year, quarterly, and as-needed basis.

Data Source: Office of Human Resources (OHR) HRACTS.

Methods, Assumptions and Suitability: OPM's 80-day hiring model is designed only to assess the time to hire new non-federal hires through the delegated examining recruitment actions only, therefore, not all Agency recruitment actions need to be reported as part of this performance measure. HRACTS tracks the time throughout EPA's hiring process from the time a hiring request is initiated until the employee comes on board. HRACTS has multiple date fields for inputting the date for each step in the hiring process. HRACTS is continually undergoing changes and modifications to meet the constant clarification and unique needs of the 80-day end-to-end hiring model. HRACTS has been revised to track the date for each step in hiring process, while meeting the diverse demands for easy access by Agency-wide managers to track the status of hiring actions. The system is being refined to notify applicants of their status of their vacancy application throughout the hiring process and also provide managers with a link to survey their perspective of the overall hiring process. HRACTS reports are being revised to provide organizations with in-depth information on the status of their pending recruitment actions in a secure and controlled environment. HRACTS limitations have prevented clear delineation of the various types of recruitment actions (e.g. merit promotion, delegated examining) as input fields are just now being incorporated into the system and being populated. This distinction is important as the 80-day end-to-end hiring process is designed to track only new non-federal hires whereas current baseline estimates reflect all hiring actions. Other improvements include better reporting templates to track trends and anomalies along the hiring process timeline.

QA/QC Procedures: HRACTS tracks hiring process activity from the time the request for a recruitment action is requested until the selected candidate enters on-board for duty. Agency-wide, Office-level, and SSC reports can be prepared on an annual, quarterly, or selected time period basis. Manager access is being piloted to better enable tracking of the status of their individual recruitment actions.

Data Quality Reviews: SSC / OHR staff review and analyze the reports to determine trends and assess workload. SSC staff review and validate the data, identify anomalies or data-entry errors, make corrections, and provide the updated information so that the system's reports can be

current and accurate. Agency managers can be provided with system access to further enhance data integrity. Questions about the data or resolution of data issues are frequently resolved through discussion and consultation with the SSC and OHR.

Data Limitations: N/A

Error Estimate: N/A

New/Improved Data or Systems: In FY08, EPA implemented HRACTS a new standardized action tracking system across the 3 new HR Shared Service Centers. Changes and modifications are ongoing to further meet the Agency's needs for improved tracking and reporting. This tracking system will facilitate further improvement in EPA's end-to-end time-to-hire process.

References: HRACTS

FY 2011 Performance Measure:

- **Cumulative percentage reduction in energy consumption in EPA's 34 reporting facilities from the FY 2003 baseline**

Performance Database: The Agency's contractor provides energy consumption information quarterly and annually. The Agency keeps the energy consumption data in the "Energy and Water Database," which is a collection of numerous spreadsheets. The contractor is responsible for reviewing and quality assuring/quality checking (QA/QCing) the data.

Data Source: The Agency's contractor requests and collects quarterly energy and water reporting forms, utility invoices, and fuel consumption logs from energy reporters at each of EPA's "reporting" facilities (the facilities for which EPA pays the utility bills directly to the utility company). The reported data are based on metered readings from the laboratory's utility bills for certain utilities (natural gas, electricity, purchased steam, chilled water, high temperature hot water, and potable water) and from on-site consumption logs for other utilities (propane and fuel oil). In instances when data are missing and cannot be retrieved, reported data are based on a proxy or historical average.

Methods, Assumptions, and Suitability: N/A

QA/QC Procedures: EPA's contractor performs an exhaustive review of all invoices and fuel logs to verify that reported consumption and cost data are correct. EPA's Sustainable Facilities Practices Branch compares reported and verified energy use at each reporting facility against previous years' verified data to see if there are any significant and unexplainable increases or decreases in energy consumption and costs.

Data Quality Reviews: N/A

Data Limitations: EPA does not currently have a formal meter verification program to ensure that an on-site utility meter reading corresponds to the charges included in the utility bill. However, as EPA implements the advance metering requirements of the Energy Policy Act of 2005 and the Energy Independence and Security Act of 2007, which should be well underway by FY 2010, calibration of advanced meters will be performed, at a minimum, on an annual basis.

New/Improved Data or Systems: N/A

References: N/A

FY 2011 Performance Measures:

- **Number of major EPA environmental systems that use the CDX electronic requirements enabling faster receipt, processing, and quality checking of data.**
- **Number of states, tribes, and territories that will be able to exchange data with CDX through nodes in real time, using standards and automated data-quality checking.**
- **Number of users from states, tribes, laboratories, and others that choose CDX to report environmental data electronically to EPA.**

Performance Database: CDX Customer Registration Subsystem.

Data Source: Data are provided by State, private sector, local, and Tribal government CDX users.

Methods, Assumptions, and Suitability: All CDX users must register before they can begin reporting. The records of registration provide an up-to-date, accurate count of users. Users identify themselves with several descriptors and use a number of CDX security mechanisms for ensuring the integrity of individuals' identities.

QA/QC Procedures: QA/QC has been performed in accordance with a CDX Quality Assurance Plan ["Quality Assurance Project Plan for the Central Data Exchange," 10/8/2004] and the CDX Design Document v.3, Appendix K registration procedures [*Central Data Exchange Electronic Reporting Prototype System Requirements*: Version 3; Document number: EP005S3; December 2000]. Specifically, data are reviewed for authenticity and integrity. Automated edit checking routines are performed in accordance with program specifications and the CDX Quality Assurance Plan. This Plan is currently being updated to incorporate new technology and policy requirements and a draft is scheduled to be released at the end of FY 2007 [contact: Sana Hamady, 202-566-1674].

Data Quality Reviews: CDX completed its last independent security risk assessment in January 2005, and all vulnerabilities are being reviewed or addressed. In addition, routine audits of CDX data collection procedures, statistics and customer service operations are provided weekly to CDX management and staff for review. Included in these reports are performance measures such as the number of CDX new users, number of submissions to CDX, number of help desk

calls, number of calls resolved, ranking of errors/problems, and actions taken. These reports are reviewed and actions discussed at weekly project meetings.

Data Limitations: The CDX system collects, reports, and tracks performance measures on data quality and customer service. While its automated routines are sufficient to screen systemic problems/issues, a more detailed assessment of data errors/problems generally requires a secondary level of analysis that takes time and human resources. In addition, environmental data collected by CDX is delivered to National data systems in the Agency. Upon receipt, the National systems often conduct a more thorough data quality assurance procedure based on more intensive rules that can be continuously changing based on program requirements. As a result, CDX and these National systems appropriately share the responsibility for ensuring environmental data quality.

Error Estimate: CDX incorporates a number of features to reduce errors in registration data and that contribute greatly to the quality of environmental data entering the Agency. These features include pre-populating data either from CDX or National systems, conducting web-form edit checks, implementing XML schemas for basic edit checking and providing extended quality assurance checks for selected Exchange Network Data flows using Schematron. The potential error in registration data, under CDX responsibility has been assessed to be less than 1 %.

New/Improved Performance Data or Systems: CDX assembles the registration/submission requirements of many different data exchanges with EPA and the States, Tribes, local governments and the regulated community into a centralized environment. This system improves performance tracking of external customers and overall management by making those processes more consistent and comprehensive. The creation of a centralized registration system, coupled with the use of web forms and web-based approaches to submitting the data, invite opportunities to introduce additional automated quality assurance procedures for the system and reduce human error.

References: CDX website (www.epa.gov/cdx).

FY 2011 Performance Measure:

- **Percent of Federal Information Security Management Act reportable systems that are certified and accredited**

Performance Database: Automated Security Self-Evaluation and Remediation Tracking (ASSERT) database.

Data Source: Information technology (IT) system owners in Agency Program and Regional offices.

Methods, Assumptions, and Suitability: Annual IT security assessments are conducted using the methodology mandated by the Office of Management and Budget (OMB), the National Institute of Standards, and Technology (NIST) Security Self-Assessment Guide for Information Technology Systems. ASSERT has automated and web-enabled this methodology.

QA/QC Procedures: Automated edit checking routines are performed in accordance with ASSERT design specifications to ensure answers to questions in ASSERT are consistent. The Office of Inspector General consistent with §3545 FISMA, and the Chief Information Officer's information security staff conduct independent evaluations of the assessments. The Agency certifies results to OMB in the annual FISMA report.

Data Quality Reviews: Program offices are required to develop security action plans composed of tasks and milestones to address security weaknesses. Program offices self-report progress toward these milestones. EPA's information security staff review these self-reported data, conduct independent validation of a sample, and discuss anomalies with the submitting office.

Data Limitations: Resources constrain the security staff's ability to validate all of the self-reported compliance data submitted by program systems' managers.

Error Estimate: N/A

New/Improved Data or Systems: N/A

References:
Annual Information Security Reports to OMB: Annual Information Security Reports to OMB: http://intranet.epa.gov/itsecurity/progreviews/; OMB guidance memorandum: http://www.whitehouse.gov/omb/memoranda/fy2007/m07-19.pdf; ASSERT web site https://cfint.rtpnc.epa.gov/assert/index.cfm; NIST Special Publication 800-53, Recommended Security Controls for Federal Information Systems. February 2005: http://csrc.nist.gov/publications/nistpubs/index.html; and, Federal Information Security Management Act, PL107-347: http://csrc.nist.gov/policies/FISMA_final.pdf

FY 2011 Performance Measures:

- **Environmental and business actions taken for improved performance or risk reduction;**
- **Environmental and business recommendations or risks identified for corrective action;**
- **Return on the annual dollar investment, as a percentage of the OIG budget, from audits and investigations; and**
- **Criminal, civil, administrative, and fraud prevention actions**

Performance Database: The OIG Performance Measurement and Results System (PMRS) captures and aggregates information on an array of measures in a logic model format, linking immediate outputs with long-term intermediate outcomes and results. OIG performance measures are designed to demonstrate value added by promoting economy, efficiency and effectiveness; and preventing and detecting fraud, waste, and abuse as described by the Inspector General Act of 1978 (as amended). Because intermediate and long-term results may not be realized over a period of several years, only verifiable results are reported in the year completed. Database measures include numbers of: 1) recommendations for environmental and management improvement; 2) legislative, regulatory policy, directive, or process changes; 3) environmental,

program management, security and resource integrity risks identified, reduced, or eliminated; 4) best practices identified and implemented; 5) examples of environmental and management actions taken and improvements made; 6) monetary value of funds questioned, saved, fined, or recovered; 7) criminal, civil, and administrative actions taken, 8) public or congressional inquiries resolved; and 9) certifications, allegations disproved, and cost corrections.

Data Source: Designated OIG staff enter data into the system. Data are from OIG performance evaluations, audits, research, analysis, court records, EPA documents, data systems, and reports that track environmental and management actions or improvements made and risks reduced or avoided. OIG also collects independent data from EPA's contractors, partners and stakeholders.

Methods, Assumptions, and Suitability: OIG performance results are a chain of linked events, starting with OIG outputs (e.g., recommendations, reports of best practices, and identification of risks). The subsequent actions taken by EPA or its stakeholders/partners, as a result of OIG's outputs, to improve operational efficiency and environmental program delivery are reported as intermediate outcomes. The resulting improvements in operational efficiency, risks reduced/eliminated, and conditions of environmental and human health are reported as outcomes. By using common categories of performance measures, quantitative results can be summed and reported. Each outcome is also qualitatively described, supported, and linked to an OIG product or output. The OIG can only control its outputs and has no authority, beyond its influence, to implement its recommendations that lead to environmental and management outcomes.

QA/QC Procedures: All performance data submitted to the database require at least one verifiable source assuring data accuracy and reliability. Data quality assurance and control are performed as an extension of OIG products and services, subject to rigorous compliance with the Government Auditing Standards of the Comptroller General[1], and regularly reviewed by OIG management, an independent OIG Management Assessment Review Team, and external independent peer reviews. Each Assistant Inspector General certifies the completeness and accuracy of performance data. OIG reports are referenced and independently quality reviewed.

Data Quality Reviews: There have not been any previous audit findings or reports by external groups on data or database weaknesses in the OIG PMRS. All data reported are audited internally for accuracy and consistency.

Data Limitations: All OIG staff are responsible for data accuracy in their products and services. However, there is a possibility of incomplete, miscoded, or missing data in the system due to human error or time lags. Data supporting achievement of results are often from indirect or external sources, with their own methods or standards for data verification/validation.

Error Estimate: The error rate for outputs is estimated at +/-2%, while the error rate for reported long-term outcomes is presumably greater because of the longer period needed for tracking results and difficulty in verifying a nexus between our work and subsequent actions and impacts beyond our control. Errors tend to be those of omission.

---

[1]Government Auditing Standards (2007 Revision), General Accounting Office, GAO-07-731G, July 2007; Available on the Internet at www.gao.gov/govaud/ybk01.htm, last updated MarchJune 2009.

New/Improved Data or Systems: The OIG developed the PMRS as a prototype in FY 2001 and constantly revises the clarity and quality of the measures as well as system improvements for ease of use. During FY 2008, the OIG implemented an Audit Follow-up Policy to independently verify the status of Agency actions on OIG recommendations, which serve as the basis for OIG intermediate outcome results reported in the OIG PMRS. During FY 2009 the PMRS was converted to a relational database directly linked to the new Inspector General Enterprise Management System (IGEMS). The quality of the data will continue to improve in FY 20102011 as staff will have to make fewer data entries due to the integrated nature of the system, gain greater familiarity with the measures, and perform follow-up verification reviews to identify and track actions and impacts. The OIG is also implementing full costing of OIG products to measure relative return on investment from the application of OIG resources.

References: All OIG non-restricted performance results are referenced in the OIG PMRS with supporting documentation available either through the OIG Web Site or other Agency databases. The OIG Web Site is www.epa.gov/oig.[2]

[2] U.S. EPA, Office of Inspector General, Audits, Evaluations, and Other Publications; Available on the Internet at www.epa.gov/oig , last updated February June 2009.