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Industrial Footprint Project
Quality Assurance Project Plan

For submittal to:
US Environmental Protection Agency, Region 10
1200 Sixth Avenue
Seattle, WA 98101

March 2007

Approval Page
Industrial Footprint Project
Quality Assurance Project Plan

Industrial Footprint Project Manager Carol Kraege Date 4-16-2007
Carol Kraege

Industrial Footprint Project Coordinator Marc E Crooks Date 4-10-2007
Marc Crooks

EPA Project Manager Carolyn Gangmark Date 4-3-2007
Carolyn Gangmark

EPA QA Manager Roy Araki Date 4-4-2007
Roy Araki

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Distribution List

This list identifies all individuals who will receive a copy of the approved quality assurance project plan, either in hard copy or electronic format, as well as any subsequent revisions.

EPA Project Manager: Carolyn Gangmark

EPA QA Officer: Roy Araki

EPA National Center for Environmental Innovation: Kristina Heinemann

Industrial Footprint Project Manager: Carol Kraege, Washington State Dept. of Ecology

Industrial Footprint Project Coordinator: Marc Crooks, Washington State Dept. of Ecology

Industrial Footprint Project Intern: Angela Fritz, Washington State Dept. of Ecology

Industrial Footprint Project Consultant, when selected

Acronyms

BOD	Biological Oxygen Demand
EMS	Environmental Management System
EPA	US Environmental Protection Agency
FRP	Facility Reporting Project
ISO	International Organization for Standardization
IT	Information Technology
MS	Microsoft
NO _x	Nitrous Oxides
OSHA	Occupational Safety and Health Administration
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
RFP	Request for Proposal
TSS	Total Suspended Solids
WISHA	Washington Industrial Safety and Health Act

1.0 Project Management

1.1 Project/Task Organization

US Environmental Protection Agency (EPA), Region 10

Carol Gangmark will serve as the EPA Project Manager. Her responsibilities include:

- Overall coordination of the project and decision maker,
- Reviewing and approval of the Quality Assurance Project Plan (QAPP) and subsequent revisions in terms of project scope and objectives, and
- Ensuring QAPP implementation.

Roy Araki will serve as the EPA Quality Assurance (QA) Officer. His responsibility will be to review and approve the QAPP and subsequent revision in terms of quality assurance aspects.

Washington State Department of Ecology (Ecology)

Carol Kraege will serve as the Industrial Footprint Project Manager. Her responsibilities will include:

- The selection and supervision of the Project Coordinator, Project Intern and the Project Consultant,
- Coordination of major tasks and ensuring project milestones are met, including quarterly progress reports and the final report to EPA,
- Recruiting and selecting participating facilities, and
- Reviewing and, as appropriate, updating the QAPP.

Marc Crooks will serve as the Industrial Footprint Project Coordinator. His responsibilities will include:

- Day-to-day project coordination,
- Development of the Request for Proposal (RFP) and coordination of the process to select the consultant,
- Recruiting and selecting participating facilities and working with major stakeholders.
- Updating the QAPP
- Data collection and information gathering, in cooperation with participating facilities
- Development and analysis of industrial footprint sustainability indicators
- Energy challenge
- Analysis of Industrial Footprint tool for other industrial sectors
- Coordination of Ecology staff, project consultant and participating facilities, when appropriate,

- Communication with EPA and other project partners on project progress and findings
- Project administration including budget, contractual services, reporting, and other related activities, and
- Ensuring that the project webpage is updated.

Angela Fritz will serve as the Industrial Footprint Project Intern. Her responsibilities will include:

- Day-to-day project operation,
- Development of the RFP and coordination of the process to select the consultant,
- Communication with participating facilities and major stakeholders.
- Updating the QAPP
- Data collection and information gathering, in cooperation with participating facilities
- Development of industrial footprint indicators
- Energy challenge
- Analysis of Industrial Footprint tool for other industrial sectors
- Coordination Ecology staff, project consultant and participating facilities, when appropriate,
- Communication with EPA and other project partners on project progress and findings
- Project administration, including reporting and other related activities, and
- Ensuring that the project webpage is updated.

The project consultant will provide expertise in stakeholder involvement and data collection, analysis and management to the project. Responsibilities will include:

- Stakeholder involvement support,
- Support in the development and analysis of industrial footprint sustainability indicators,
- Preparing reports, analyses, and other information as requested by the project team,
- Serving as an expert advisor to the project on footprint issues,
- Research and work with participating facilities on identifying potential markets for waste streams, and
- Incentives development support.

Other support, as appropriate, will include the following:

Engineering support: The Industrial Section has a 6 person unit dedicated to regulation of the pulp and paper sector within Washington. The five engineers in the unit have greater than 100 years of combined experience in environmental work and over 60 years with the pulp and paper sector. Each engineer is responsible for air, water and waste regulation at two major mills and several minor pulp and paper facilities. Their role, as necessary, will be to: assist in development of the sector and individual facility

footprints, review reports, provide advice to the project manager and the contractor, and help with data collection and analysis.

Regulatory expertise: Merley McCall is a chemist and has supervised the pulp and paper unit since 1993. He has 43 years of experience in the environmental field, a good portion of which was spent managing Ecology's lab. He has considerable expertise in the application of the federal cluster rule (the basis of regulation at pulp and paper facilities) and is widely regarded as an expert in this area. His role will be to provide advice to the contractor, help scope the development of footprints, review documents and assist the project manager and the project coordinator.

Information Technology (IT) support: Ecology staff Rupert Wild and Craig Gilley will be responsible for maintenance of the project's webpage.

1.2 Problem Definition/Background

The EPA Innovation Strategy states that "environmental programs should address a broader range of issues than they typically do today. The goal should be greater environmental responsibility and natural resource stewardship across all of society, along with successful integration of environmental, economic, and social objectives." It also states that new approaches need to "emphasize results more than the means to achieve them, using regulatory and non-regulatory tools and working in partnership with others. In such instances, public accountability should be provided through use of meaningful performance tools".

It is out of this recognition of the need for a more sustainable society that Ecology's Industrial Section has received an innovative grant from EPA to conduct an analysis of an environmental footprint, called the Industrial Footprint Project. With the big picture in mind, the Industrial Footprint Project will develop a performance measurement tool for assessing environmental, economic and social impacts for the pulp and paper sector in Washington State.

We are defining an industrial footprint as the impact of a major manufacturing facility on the environment and the community in which it's located. It is measured in sustainability terms (environmental, economic and social impacts), and includes many environmental aspects that Ecology and EPA do not directly regulate, such as greenhouse gasses or resource use. Footprint measurement puts a spotlight on the need for companies to pursue opportunities for saving energy, water, materials and money, (i.e. those areas where compliance alone is not enough). It adds rigor to the use of environmental management systems already in place. We hope to demonstrate that permitting, other regulatory work, and beyond compliance activities can be tied more directly to real environmental improvement.

This QAPP addresses the Industrial Footprint Project and fulfills quality assurance requirements dictated by the receipt of Cooperative Agreement EI-96028401-0. The

purpose of this QAPP is to ensure that sample collection and analytical activities are conducted in accordance with technically acceptable protocols and meet data quality objectives. The methods and QA procedures described herein will be used by the Ecology and its contractors during data collection activities beginning March 2007.

This QAPP was prepared following the EPA's guidance, specifically the *EPA Requirements for Quality Assurance Project Plans* (March 2001).

The primary purpose of this project is to develop a holistic measure of facility performance and to evaluate whether or not this measurement is useful for:

- identifying beyond compliance priorities for the facility
- developing priorities for our own staff, and
- improving environmental performance at facilities.

1.3 Project/Task Description

The footprint measurement tool being tested is based on indicators taken from the draft Facility Reporting Project (FRP) Pilot Test Sustainability Reporting Guidance, released March, 2005. The FRP Guidance is a tool created by the Ceres and the Tellus Institute. The FRP is a multi-stakeholder initiative to develop a generally accepted facility-level economic, environmental and social sustainability reporting framework. As part of our participation agreement, Ecology can access the resources of Ceres to help in development of facility indicators and the public involvement plan. We will not, however, be asking our project participants to become pilot testers or to become Ceres members.

The deliverable of this project is a performance measure tool. For it to be useful it must have the following characteristics:

- credible- to the community, the state, the facilities and EPA
- broad - includes all major environmental impacts and can be adapted to measure economic and social impacts as well
- robust- can be used as a sector or facility measure and can be used to compare similar facilities
- cost effective- data gathering and analysis costs are reasonable
- transparent- the need for proprietary data is minimized
- transferable- the tool is useful for other facilities
- informative- changes the way environmental performance of facilities is evaluated

The pulp and paper sector footprint will consist of a series of measures common to all the pulp mills. At a minimum, the sector footprint will include energy measures, greenhouse gases, water use, waste biological oxygen demand (BOD), total suspended solids (TSS), and nitrous oxides (NO_x). Additional measures are likely to be added as a result of the collaboration between the agency and the industry. The footprint will include economic and social indicators if the project can successfully develop the indicators. The

individual footprints will include all the sector indicators plus those specific to the facility and the local community.

Both the sector and individual baseline footprints will provide opportunity for the regulatory agency to develop priorities. The sector baseline will help reveal anomalies between facilities and if specific processes or pollutants present opportunity for improvement. The individual baseline footprints will help reveal whether there are specific concerns within a particular facility. In both cases, Ecology will work with the partners to develop priorities for action. If time allows, the top sector priority and the top priorities at two facilities will be initiated.

The project will generally follow the following steps:

1. Select indicators for the sector and for each facility. This will be done in partnership with the facilities and with input from community members and requires the development of a stakeholder involvement plan.
2. Measure the baseline footprint for the sector and the facilities using the selected indicators. This step will require evaluation and analysis of a significant amount of data.
3. Issue an energy challenge to the sector facilities, asking them to voluntarily reduce their energy usage. We will then use the footprint indicators to measure progress against the established baseline.
4. Develop a set of environmental priorities for the sector and each facility, working in partnership with the stakeholders.
5. Implement priority actions and measure results.
6. Assess the utility of this approach to improving environmental results, including identifying barriers to implementation, recommended improvements and follow-up actions. This assessment will include a comparison of mills within the sector and a comparison of the holistic performance of those mills with an environmental management system (EMS) in place to those without one.

The project schedule is outlined in Appendix A.

1.4 Quality Objectives and Criteria

The project data quality objective is to analyze, display, and document valid data, as it pertains to the development of an industrial footprint. Acquired datasets will be maintained at the original level of accuracy. When modifications are necessary, efforts will be made to provide accuracy on a larger scale, and documentation will accompany the changes.

1.5 Special Training/Certification

Not applicable

1.6 Documents and Records

All data acquired will be fully documented as to original source, quality and history using Microsoft (MS) Excel spreadsheets, Word tables, or Access databases.

2.0 Data Generation and Acquisition

2.1 Sampling Process Design

Not applicable.

2.2 Sampling Methods Requirements

Not applicable.

2.3 Sample Handling and Custody Requirements

Not applicable.

2.4 Analytical Methods Requirements

Not applicable.

2.5 Quality Control Requirements

All data acquired will be fully documented as to original source, quality, and history using MS Excel spreadsheets, Word table, and/or Access databases.

2.6 Instrument/Equipment Testing, Inspection, and Maintenance Requirements

Not applicable.

2.7 Instrument Calibration and Frequency

Not applicable.

2.8 Inspection/Acceptance Requirements for Supplies and Consumables

Not applicable.

2.9 Data Acquisition Requirements for Non-Direct Measurements

All data for this project will be acquired from the records maintained by participating pulp and paper mills. Ecology will not be taking water or air samples for this project. Instead, Ecology will use certified monthly monitoring data for air and water parameters submitted by the mills to meet regulatory requirements. Data for non-regulatory areas

(such as raw materials) will be weighted, documented data with clear units of measurement. Only data that has clear, verifiable units of measurement will be accepted.

For environmental indicators, mill data sources will include:

Waste:	Waste log books
Air:	Emissions records
Water:	Water consumption records from raw water flow meters
Raw Materials:	Purchasing records for raw materials
Management Techniques:	Mill EMS, International Organization of Standardization (ISO) 14001, EPA Performance Track Program participation

For economic indicators, mill data sources will include:

Labor:	Personnel and accounting records
Costs of Goods and Services:	Service contract, purchasing records (equipment records, raw materials, etc)

For social indicators, mill data sources will include:

Nuisance:	Odor complaint log books, noise complaint records, truck traffic records
Social Awards:	Mill documentation of environmental awards
Community Involvement:	Mill financial records (for social donations and charities), purchasing records (as they pertain to purchases of supplies from within the community)
Health and Safety:	Occupational Safety and Health Administration (OSHA)/Washington Industrial Safety and Health Administration (WISHA) records

Samples and measurements must be representative of the volume and nature of the parameter. Due to uneven monitoring frequencies between datasets, annual measurements of data are preferred. Data must be collected using only discrete measurement procedures. Weights must be weighed using a scale or routine containers that have been weighted when full. Future measurements are calculated by measuring the volume of the material in the standard container.

We will accept larger variance for waste stream samples.

Air emissions data must be measured using certified calibrated continuous emission monitors, certified source tests, or existing Ecology approved emission factors.

Water data must be sampled using accepted sampling methods, including composite sampling. Samples must follow Ecology protocols. All samples must be analyzed by an accredited lab.

2.10 Data Management

Data will be stored and managed using MS Excel spreadsheets, Word table, and/or Access databases. Digital files will be used and reside on computers at Ecology. Data will be transferred to EPA Region 10 via email, in the form of digital files mentioned above. Other forms of data duplication may include hard copies, CD-ROM, and USB memory keys.

Original digital data will be kept on computer drives at Ecology for a period of at least 3 years after the Final Report is submitted.

Data will be managed in accordance with any applicable State, EPA and Federal requirements.

3.0 Assessment and Oversight

3.1 Assessments and Response Actions

Marc Crooks, Angela Fritz, and the Contractor selected will make modifications to the footprint analysis tool as appropriate. The level of review is related to the scale of the project. We will evaluate the usability of the indicators by providing an assessment of the data received, data management, analysis and indicator usage. Usable data, as defined in 2.9, will be accepted or rejected in an objective and consistent manner. Usability of a footprint tool indicator must be satisfactory prior to moving on to the next indicator. A satisfactory indicator is defined as that which has been well documented and is easily understood as to its value and necessity to the overall footprint score.

3.2 Reports to Management

Quarterly Reports will be submitted to Carolyn Gangmark, per the standard reporting process for review and approval.

Angela Fritz and Marc Crooks will submit quarterly reports and an interim Final Report to the EPA Project Manager. This interim Final Report will include a complete discussion regarding the appropriate use and limitations of the data in terms of quality. Additional reports or other information related to project status, concerns, completed deliverables, or any other project needs will be provided if requested.

Carol Kraege and Marc Crooks will submit a Final Report to the EPA Project Manager. This Final Report will include a complete discussion regarding the appropriate use and limitations of the data in terms of quality. Additional reports or other information related to project status, concerns, completed deliverables, or any other project needs will be provided if requested.

Ecology will issue a stop work order upon finding a significant condition that would adversely affect the quality and usability of the data.

4.0 Data Validation and Usability

4.1 Data Review, Validation, and Verification Requirements

The data quality will be peer reviewed for logical consistency and errors as identified by appropriate statistical methods, including but not limited to variance and t-tests. Carol Kraege and Marc Crooks will be responsible for overall validation and final approval of the data in accordance with project purpose and use of the data. Other peer review of data will be done by Angela Fritz and the Project Consultant.

4.2 Validation and Verification Methods

Carol Kraege and Marc Crooks will provide review and approval of the data before closure of the project. Documentation of datasets will be reviewed to verify references to use and limitations of the data.

Carol Kraege and Marc Crooks will review reports and peer reviews to ensure they are acceptable. They will also compare final datasets with original source information for consistency.

4.3 Reconciliation with User Requirements

Applicability and limitations of the data will be evaluated on an indicator-by-indicator basis as necessary. Completeness will be evaluated to determine if the completeness goal for this project has been met. The completeness goal for data is defined as an annual database for an indicator that is representative of an indicator's performance for each study. If the quality of the data does not meet the project's requirements, the data may be reevaluated to determine why the data quality did not meet the goals.

Appendix A

Task	Task Description	Assign-ment	Milestone	Start Date	End Date
1. Secure agency resources	Hire project coordinator, include project work in IS staff workplans	PM	PI hired, workplans revised	4/06	Original - 6/06 Actual - 12/06 Completed
2. Secure mill participation	Partner with 8 pulp and paper mills and secure participation	Ceres, PM, PC, PI	8 participation letters issued	06/06	5/07
3. Select sector indicators	Develop draft sector indicators. Work with 8 mills and Northwest Pulp and Paper Association to finalize sector indicators.	PC, PI	Sector indicators agreed upon	10/06	2/07
4. Conduct Community Outreach	Establish community contacts, create website, implement community involvement plan	C, PC, PI	Community needs assessment report complete for 8 communities	12/06	12/07
5. Secure contractor support	Draft and issue RFP to procure contractor support of data analysis and public involvement. Award contract.	PM, PC, PI	Contract in place.	1/07	5/07
6. Select indicators for 8 mills	Partner with 8 mills and 8 communities to develop mill specific indicators	MP, PC, PI, PM	Indicators selected for 8 mills	1/07	7/07
7. Amend QAPP	Develop data quality objectives for 8 individual mill footprints	PC, PI	QAPP amendment approved	2/07	3/07
8. Develop stakeholder	Develop a community	PM, PC, PI,	Stakeholder involvement	2/07	4/07

Task	Task Description	Assignment	Milestone	Start Date	End Date
involvement plan	stakeholder involvement plan	C, Ceres	plan complete		
9. Develop baseline footprints for 8 mills	Collect and analyze data to complete 8 baseline footprints	PM, PC, PI, C	8 baseline footprints completed	2/07	7/07
10. Amend QAPP	Develop data quality objectives for sector footprint	PM, PC, PI, C	QAPP amendment approved	4/07	5/07
11. Develop sector baseline footprint	Collect and analyze data to complete sector baseline footprint	PC, PI, C	Baseline sector footprint completed	5/07	9/07
12. Develop sector priorities	Evaluate the baseline footprint for 4 mills for improvement opportunities, establish priorities	PM, PC, PI, C	Regulatory agency priorities for the sector established	7/07	10/07
13. Initiate sector priorities	If appropriate, initiate sector priority	PC, PI	Top sector priority initiated	11/07	3/09
14. Develop priorities for 4 mills	Evaluate the baseline footprint for 4 mills for improvement opportunities, establish priorities	PM, PC	Regulatory agency priorities established for 4 mills	1/08	4/08
15. Initiate 2 of the top individual priorities	If appropriate, initiate the top priorities for 2 mills	PM, PC	Top 2 mill priorities initiated	4/08	3/09
16. Amend QAPP	Develop data quality objectives for energy footprint indicators	PM, PC, C	QAPP amendment approved	3/08	4/08
17. Initiate and conduct energy challenge	Partner with pulp and paper mills to develop and initiate a sector energy challenge	PM, PC	Energy challenge initiated; sector baseline energy	4/08	1/09

Task	Task Description	Assignment	Milestone	Start Date	End Date
			footprint developed		
18. Final Report	Compare mills, assess the utility of the footprint measurement as a regulatory tool, share results with stakeholders	PM, PC, C	Report complete, future work identified	11/08	4/09
19. Assess results of the energy challenge	Use the footprint tool to assess the results of the energy challenge	PM, PC, C	Energy footprint reduced	2/09	4/09

PM = Project Manager (Carol Kraege)

PC = Project Coordinator (Marc Crooks)

PI = Project Intern (Angela Fritz)

C = Contractor