

15:14:40

OCA PAD AMENDMENT - PROJECT HEADER INFORMATION

03/07/97

Active

Project #: N-20-601 Cost share #: N-20-311 Rev #: 2
Center #: 25/24-6-R0050-0A0 Center shr #: 25/22-1-F0050-0A0 OCA file #:
Contract#: AGR DTD 960201 Mod #: APP DTD 970225 Work type : RES
Prime #:
Subprojects ? : N CFDA:
Main project #: PE #:

Project unit: EDI Unit code: 03.025.000
Project director(s):
ELLINGTON E P EDI (404)894-4137

Sponsor/division names: POLLUTION PREVEN ASSIST DIV / ATLANTA, GA
Sponsor/division codes: 300 / 123

Award period: 960201 to 970930 (performance) 970930 (reports)

Sponsor amount	New this change	Total to date
Contract value	0.00	104,000.00
Funded	0.00	104,000.00
Cost sharing amount		104,000.00

Does subcontracting plan apply?: N

Title: ONE YEAR SERA AGREEMENT

PROJECT ADMINISTRATION DATA

OCA contact: Brian J. Lindberg 894-4820

Sponsor technical contact Sponsor issuing office

GREG ANDREWS G. ROBERT KERR
(404)651-5120 (404)651-5120

GA DEPARTMENT OF NATURAL RESOURCES GA DEPARTMENT OF NATURAL RESOURCES
POLLUTION PREVENTION ASSISTANCE DIV POLLUTION PREVENTION ASSISTANCE DIV
SUITE 450 SUITE 450
7 MARTIN LUTHER KING, JR. DRIVE, SW 7 MARTIN LUTHER KING, JR. DRIVE, SW
ATLANTA, GA 30334-9004 ATLANTA, GA 30334-9004

Security class (U,C,S,TS) : U ONR resident rep. is ACO (Y/N): N
Defense priority rating : N/A N/A supplemental sheet
Equipment title vests with: Sponsor GIT
NONE PROPOSED OR ANTICIPATED.

Administrative comments -
PER APPROVAL FROM G. ROBERT KERR DATED 2/25/97 THE PERIOD OF PERFORMANCE HAS
BEEN EXTENDED THROUGH SEPTEMBER 30, 1997.

u
4

Closeout Notice Date 17-NOV-1997

Project Number N-20-601

Doch Id 39234

Center Number 25/24-6-R0050-0A0

Project Director ELLINGTON, EDWARD

Project Unit EDI-ATDC

Sponsor POLLUTION PREVEN ASSIST DIV/ATLANTA, GA

Division Id 5688

Contract Number AGR DTD 960201

Contract Entity GTRC

Prime Contract Number

Title ONE YEAR SERA AGREEMENT

Effective Completion Date 30-SEP-1997 (Performance) 30-SEP-1997 (Reports)

Closeout Action:	Y/N	Date Submitted
Final Invoice or Copy of Final Invoice	Y	23-JUL-1997
Final Report of Inventions and/or Subcontracts	Y	
Government Property Inventory and Related Certificate	Y	
Classified Material Certificate	N	
Release and Assignment	N	
Other	N	

Comments

Distribution Required:

Project Director/Principal Investigator	Y
Research Administrative Network	Y
Accounting	Y
Research Security Department	N
Reports Coordinator	Y
Research Property Team	Y
Supply Services Department/Procurement	Y
Georgia Tech Research Corporation	Y
Project File	Y

NOTE: Final Patent Questionnaire sent to PDPI

Georgia Tech

ECONOMIC DEVELOPMENT
INSTITUTE

N-20-601

2

N-20-602

1

(New)

Georgia Institute of Technology
134 O'Keefe Building
Atlanta, Georgia 30332
USA
404/894-3841 • Office
404/894-8281 • Fax

Mr. Greg Andrews
Program Manager
Georgia Pollution Prevention Assistance Division
Suite 450
7 Martin Luther King Jr. Dr.
Atlanta GA 30334-9004

November 6, 1996

**SUBJECT: Contract N-20-601: ONE YEAR SERA AGREEMENT and
Contract N-20-602: P²AD SUPPORT SERVICES AGREEMENT
Quarterly Report; Performance Period August - October 1996**

Dear Mr. Andrews:

Please find the captioned report of Georgia Tech activities for your review. I trust our performance meets your expectations. Please call if you have questions or comments.

Respectfully Submitted,

John C. Adams, P.E.
Georgia Environmental Partnership
Georgia Tech Economic Development Institute

Enclosures

cc: Dr. Edward P. Ellington, Director
Management Services, Georgia Tech Economic Development Institute

Quarterly Progress Report

**ONE YEAR SERA AGREEMENT
and
P²AD SUPPORT SERVICES AGREEMENT**

**Contract Number: Contract N-20-601 and Contract N-20-602
Performance Period: August - October 1996**

Sponsored By:

**GEORGIA POLLUTION PREVENTION ASSISTANCE DIVISION
Suite 450
7 Martin Luther King Jr. Dr.
Atlanta GA 30334-9004**

Submitted By:

**Georgia Tech Economic Development Institute
Georgia Institute of Technology
Atlanta GA 30332-0640
November 4, 1996**

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2. Project Reports, Budget Status & Program Schedules: One Year SERA Agreement	3
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1.0 Executive Summary

This document defines the scope of work and progress of the Georgia Tech Economic Development Institute (EDI) in concert with the Pollution Prevention Assistance Division (P²AD) and the University of Georgia in establishing and operating the Georgia Environmental Partnership (GEP) via funding provided by the Southeastern Environmental Resources Alliance (SERA), P²AD, and in-house cost share. This program is made possible via two contracts with the Georgia Tech Research Corporation: "One Year SERA Agreement" and "P²AD Support Services Agreement". Even though these are two unique contracts with unique deliverables, for the purposes of report brevity, the delivery of effort under the agreements is combined below in a single report outlining our GEP efforts. Because these efforts are in partnership with two other operations listed above, we acknowledge the efforts reported below involve the other members of the partnership where the lead role and source of success may well be any one of the three partners. The following tasks generalize the overall effort:

Task 1. Technical Assistance

EDI will provide general environmental assessments to individual companies in the form of on-site assessments at industrial facilities throughout Georgia. These assessments are designed to identify potential energy efficiency, environmental compliance, and/or pollution prevention concerns. On-site assessments will be conducted at numerous plants using EDI's existing staff of field agents and skill center specialists.

The assessments will be preliminary in nature (feasibility grade) requiring 2-3 man days of effort each. More complex or involved assessments (requiring detailed analysis of pollution prevention concepts, measures, and technologies) will be referred to P²AD's pollution prevention staff engineers, especially where broad application of the results in the state is desirable.

Task 2. Regional Seminars

EDI will conduct geographically based seminars. Development and planning functions will be coordinated with P²AD's public outreach coordinators. Seminars will deal with topics germane to the needs of Georgia industries. EDI will arrange meeting space, marketing services, and informational materials through its network of regional offices.

Task 3. Industry Sector Seminars

EDI will assist P²AD in the development of three industry sector specific seminars. EDI will identify speakers and develop materials as requested by P²AD with particular emphasis on matters relating to industrial energy efficiency and environmental compliance. P²AD will assume primary responsibility for the presentation of information pertaining to

pollution prevention measures and technologies. EDI, in conjunction with P²AD's public outreach coordinators, will be responsible for the planning and logistical support for the seminars, including but not limited to, advertising, site selection, and recruitment of speakers.

Task 4. Support and Promotion

EDI will provide training, resource identification/referral and management support, where appropriate, in support of implementation projects conducted by SERA in Georgia.

EDI will prepare fact sheets on energy efficiency, environmental compliance, and pollution prevention methodologies. These fact sheets will identify common environmental management problems and provide information requirements, economic justifications, and sources for additional materials.

EDI will participate in trade shows and conferences to promote the environmental management services provided by the Georgia Partners. This task will include the operation of exhibits and information booths and the delivery of presentations at environmental conferences throughout the region.

Task 5. Industry Networks

EDI will develop regionally based system of industry networking groups. The purpose of these groups is to promote information exchange, problem solving, and mentoring among neighbor facilities. EDI will enlist the support and assistance of trade organizations, and/or local chambers of commerce. As many as nine industry networking groups may be developed through EDI regional offices around the state.

EDI will participate in the development of a pollution prevention excellence recognition (Pollution Prevention Partners) program including promotion and award recipient(s) screening.

2.0 Project Reports, Budget Status & Program Schedules: One Year
SERA Agreement

2.1 Program Activities for the August 1996 - October 1996 Quarter

This section describes activities that have occurred during the captioned quarter. A perspective of how these items compare to the goals in the contract as depicted in the program schedule is presented in Section 2.2.

2.1.1 On-Site Assessments

The primary mission of the first quarter for providing on-site assessments is to identify and train field agents. These individuals will be the primary service providers. Georgia Tech Economic Development Institute (EDI) identified ten field agents for this task:

John Adams
Atlanta, GA
(404)894-4138

Jerry Zolkowski
Dalton, GA
(706)272-2702

Mike Brown
Atlanta, GA
(404)894-6107

Steve Cowart
Douglas, GA
(912)384-1121

Bill Meffert
Atlanta, GA
(404)894-3844

Russ Scott
Dublin, GA
(912)275-6543

Ed Hardison
Albany, GA
(912)430-4188

Chris Downing
Griffin, GA
(770)412-4081

Robert Hitch
Columbus, GA
(706)568-2482

George Lee
Macon, GA
(912)751-6190

These individuals have been selected for their location, technical background and resources they bring to the program. Because of widely varying backgrounds, and internal training program of meeting and holding technical sessions about every few months has been planned in an effort to standardize the services offered by each of the team members. These sessions have been held on April 24-25 and August 28-29 with a third session planned for December 12.

Additionally, we have developed a standardized pollution prevention audit tool to further

enable field agents to offer a consistent framework for in-plant assessments. Even though the tool will not offer the level of detail that is typically provided by experts, it will offer a greater depth and level of consistency than could be expected simply by providing field agent training. The tool will begin testing in the next quarter.

Coordination of in-plant assessments is made with Pollution Prevention Assistance Division (P²AD). The general practice has been established to route facility assistance requests through P²AD. These requests are then evaluated with EDI responding to those requests forwarded for field agent support. In addition, field agents respond to local requests as a matter of routine. These routine requests involve a wide range of support from locating recycling vendors to developing model Title V Air Permit applications for carpet manufacturers.

EDI in-plant assessments performed and/or in progress include:

- Sundor Brands, Inc. - Energy and waste minimization study
- Cornerstone Mfg. Co. - Title V and SARA Title III evaluation
- Harrell Equipment Co. - Title V evaluation
- Peerless Mfg. Co. - Title V and SARA Title III evaluation
- T M Poly Film, Inc. - Film cooling evaluation (energy assessment)
- TCI, Inc. - Energy use assessment
- Ga. Diversified Ind. - Support on PET recycling/use
- Semco Mfg. - Environmental effects of heat wheel evaluation
- Toppan Interamerica, Inc. - Energy/waste analysis
- Sunnyland Farms - Environmental compliance assistance
- World Carpets Inc. - Title V application (to develop industry model with the Carpet and Rug Institute)
- Wilson Trading Co. - Wood by-product hog for reuse
- Avery Dennison, Inc - Reduction in the generation of waste paper
- Mathis Akins Concrete Block Co - Reuse of fiber reinforced concrete
- Polymer Creations - Support in chemically characterizing ground tires for recycling
- Certain-Teed Corp - Reuse of glass fiber
- Barnett Products - Improved handling of reused rubber foam (filling pillows)
- Adel Steel Co. - Improvements design in paint booth

2.1.2 Sector Specific Training

For sector specific training endeavors, see Section 2.1.4.

2.1.3 Regional Seminars

Group technology transfer preparation and production for state regions is as indicated below:

“ISO 14000 International Standards: A Model for an Environmental Management System” (10/9/96), a teleconference shown in ten locations.

“Environmental Best Manufacturing Practices: A Bridge to Solving Environmental Problems” (11/20/96), a teleconference shown in ten locations.

2.1.4 Industry Sector Seminars

Group technology transfer preparation and production for specific industry sectors is as indicated below:

“Energy Efficiency and Waste Reduction in the Carpet Industry” (11/7/96)

“Energy Efficiency and Waste Reduction in the Plastics Industry” (planned for 02/20/97)

“Pollution Prevention in the Printing Industry” (planned for the week of 01/20/97)

2.1.5 Awareness Events

This quarter, EDI supported efforts to construct a full size (8'x10') trade show booth and a brochure for the GEP. The booth and brochure were completed in September.

Participation in awareness events with the booth is focused in trade shows, expositions, and conferences. Current activity includes:

The Bobbin Show International (10/1-4/96)

Environmental Management Forum (10/21-23/96)

World Energy Engineering/The Environmental Technology Expo/Plant and Facilities Expo (11/6-8/96)

2.1.6 Database Information Input

The environmental database development effort is headed by the University of Georgia. EDI provides support to the effort. The leader in support of this effort for EDI is John Adams. Support for this project component is ongoing.

2.1.7 Savannah River Plant Interface

Support for this project component is ongoing on an as needed basis. Support for this program component is headed by John Adams.

2.1.8 Project Administration

This program is co-directed by John Adams and Ned Ellington. Day to day project administration and resource management is performed by John Adams.

2.2 Program Schedule

Exhibit 2.2.A, attached, summarizes EDI's performance on the program. It also shows the contract deliverables and current program status.

2.3 Budget Summary

Exhibit 2.3.A, attached, depicts EDI's cost performance on the program. The chart represents current and planned expenditures.

3.0 Project Reports, Budget Status & Program Schedules: P²AD Support Services Agreement

3.1 Program Activities for the August 1996 - October 1996 Quarter

3.1.1 On-site Assessments

On-site assessments produced in concert with P²AD for the program to date include:

World Carpets, Inc of Dalton
Initial Visit: 10/30/96
Anticipated Project Completion: January 1997

3.1.2 Pollution Prevention Workshops

Workshops produced in concert with P²AD for the program to date include:

“Wood Finishers and Furniture Manufacturers Workshop and Teleconference”
Conducted on: 9/18/96 and 9/25/96
Attendance: 134

Task #	Description	Month(1)										Project Totals	Project Goals	
		1	2	3	4	5	6	7	8	9	10			
1	On-Site Assessments	6	6	6									18	25
2	Sector Specific Training												0	25
3	Regional Seminars			2									2	12
4	Industry Sector Training		1		1		1	1					4	2
5	Awareness Events			2	1								3	3
6	Database Information Input (2)	000	000	000	000	000	000	000	000	000	000			000
7	SRP Interface (2)	000	000	000	000	000	000	000	000	000	000			000
8	Project Administration (2)	000	000	000	000	000	000	000	000	000	000			000

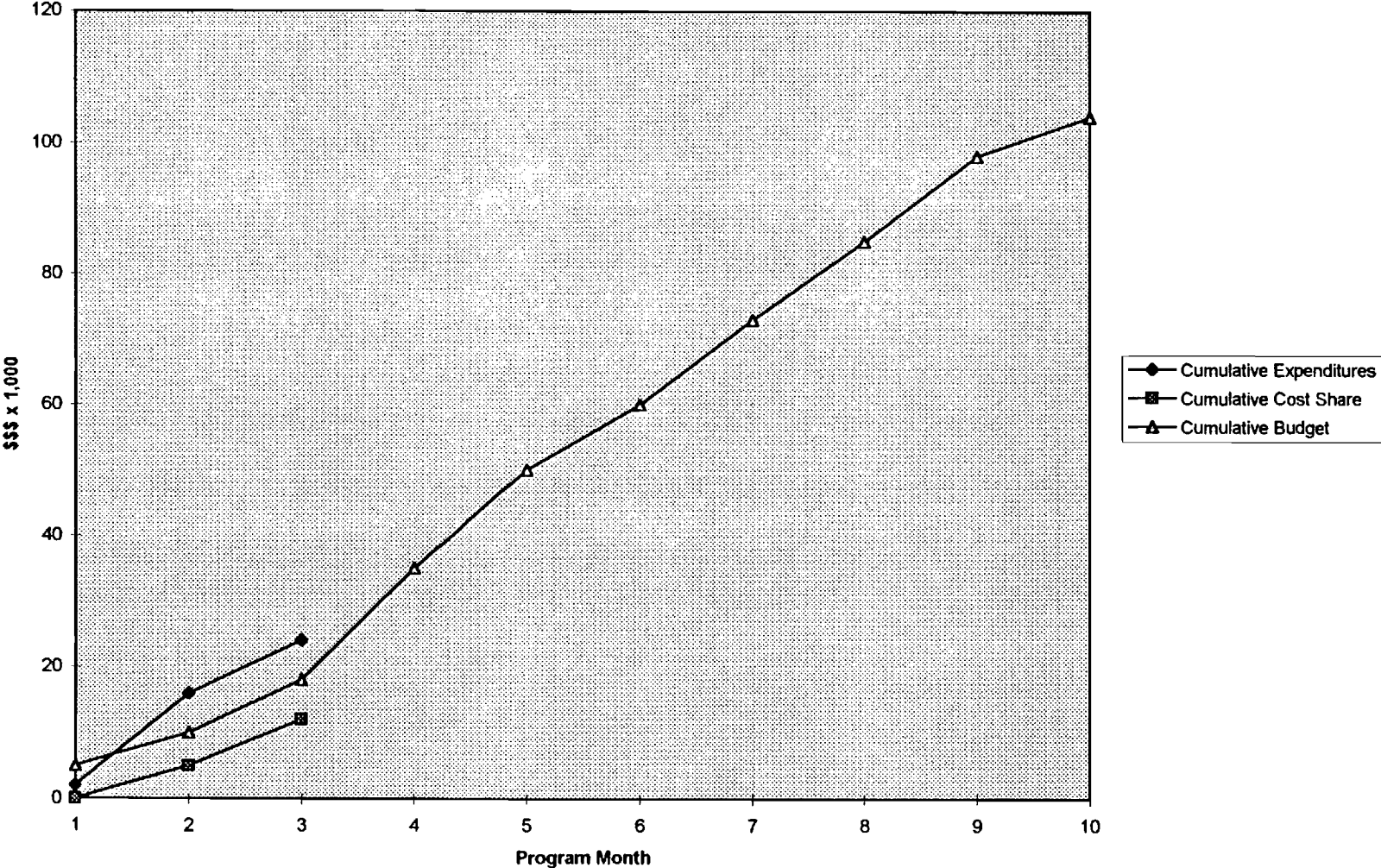
(1) Program formally initiated in August 1996. Planned completion date is June 30, 1997.

(2) Ongoing support as needed

One Year SERA Agreement Program Schedule and Accomplishments

Table 2.2.A

Exhibit 2.3.A
One Year SERA Agreement Budget Summary



3.1.3 Industry Networks

Development and production of pollution prevention networks in industry has been limited this quarter to surveying the state to understand what is currently occurring and identifying the critical success factors. Initial effort will be focused on 1) fostering existing networks which do not have adequate vitality and 2) broadening the scope of EDI's existing efforts with ISO 14000 networks. These tasks are being lead by Ms. Deann Desai.

3.1.4 Pollution Prevention Partners (P³) Certification Program

Support for this project component is ongoing on an as needed basis. The EDI field agents have been made aware of the program and brochures have been distributed to each office. Additional training is planned to enable field agents to provide in-plant support, verification, and applicant recruitment. Support for this program component is headed by John Adams.

3.2. Program Schedule

Exhibit 3.2.A, attached, summarizes EDI's performance on the program. It also shows the contract deliverables and current program status.

3.3 Budget Summary

Exhibit 3.3.A, attached, summarizes EDI's cost performance on the program. The chart represents current and planned expenditures.

4.0 Plans for the Next Quarter

Activities planned for next quarter include continuation of the activities listed above. Efforts will also be focused on developing/establishing industry networks utilizing the information gained this quarter and providing a higher rate of deployment of on-site assessments.

Task #	Description	Month(1)										Project Totals	Project Goals	
		1	2	3	4	5	6	7	8	9	10			
1	On-Site Assessments			1									1	15
2	P2 Workshops		1				1						2	2
3	Industry Networks													9
4	P3 Program Support (2)	000	000	000										0

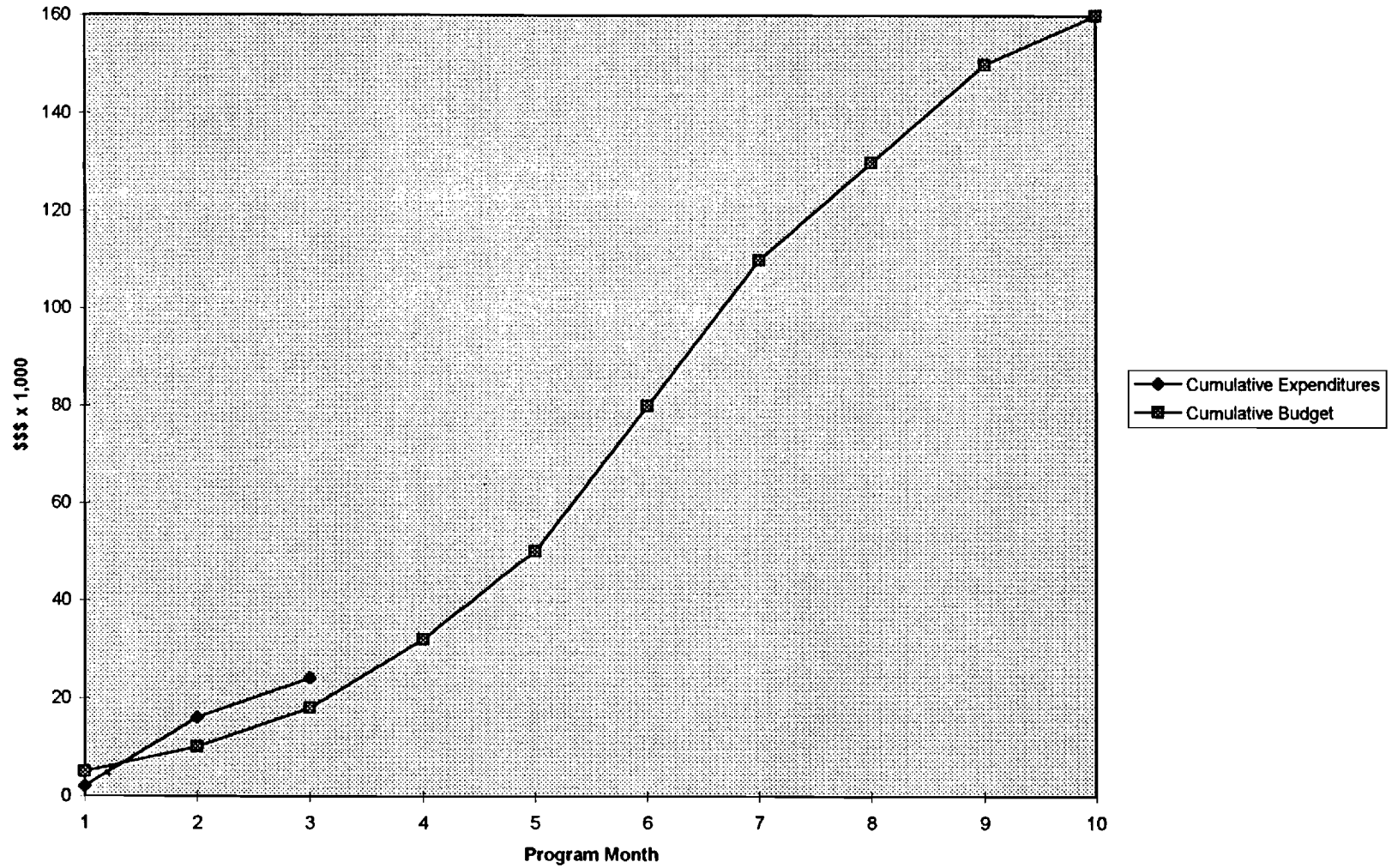
(1) Program formally initiated in August 1996. Planned completion date is June 30, 1997.

(2) Ongoing support as needed.

P2AD Support Services Agreement Program Schedule and Accomplishments

Table 3.2.A

Exhibit 3.3.A
P2AD Support Services Agreement



5.0 Appendix: Program Fliers and Promotional Materials

Georgia Tech

ECONOMIC DEVELOPMENT
INSTITUTE

N-20-601-N/A
♀
N-20-602 #2

Georgia Institute of Technology
134 O'Keefe Building
Atlanta, Georgia 30332
USA
404/894-3841 • Office
404/894-8281 • Fax

Mr. Greg Andrews
Program Manager
Georgia Pollution Prevention Assistance Division
Suite 450
7 Martin Luther King Jr. Dr.
Atlanta GA 30334-9004

February 7, 1997

**SUBJECT: Contract N-20-601: ONE YEAR SERA AGREEMENT and
Contract N-20-602: P²AD SUPPORT SERVICES AGREEMENT
Quarterly Report; Performance Period November 1996 - January 1997**

Dear Mr. Andrews:

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Respectfully Submitted,

/ John C. Adams, P.E.
Georgia Environmental Partnership
Georgia Tech Economic Development Institute

Enclosures

cc: Dr. Edward P. Ellington, Director
Management Services, Georgia Tech Economic Development Institute
Dr. David S. Clifton, Director
Center for International Standards and Quality
Dr. Jackie Sellers, Public Services Associate
Driftmier Engineering Center, University of Georgia
Georgia Tech GEP staff

Quarterly Progress Report

**ONE YEAR SERA AGREEMENT
and
P²AD SUPPORT SERVICES AGREEMENT**

**Contract Number: Contract N-20-601 and Contract N-20-602
Performance Period: November 1996 - January 1997**

Sponsored By:

**GEORGIA POLLUTION PREVENTION ASSISTANCE DIVISION
Suite 450
7 Martin Luther King Jr. Dr.
Atlanta GA 30334-9004**

Submitted By:

**Georgia Tech Economic Development Institute
Georgia Institute of Technology
Atlanta GA 30332-0640**

February 7, 1997

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4. Plans for the Next Quarter	13

1.0 Executive Summary

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The assessments will be preliminary in nature (feasibility grade) requiring 2-3 man days of effort each. More complex or involved assessments (requiring detailed analysis of pollution prevention concepts, measures, and technologies) will be referred to P²AD's pollution prevention staff engineers, especially where broad application of the results in the state is desirable.

Task 2. Regional Seminars

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Task 3. Industry Sector Seminars

EDI will assist P²AD in the development of three industry sector specific seminars. EDI will identify speakers and develop materials as requested by P²AD with particular emphasis on matters relating to industrial energy efficiency and environmental compliance.

P²AD will assume primary responsibility for the presentation of information pertaining to pollution prevention measures and technologies. EDI, in conjunction with P²AD's public outreach coordinators, will be responsible for the planning and logistical support for the seminars, including but not limited to, advertising, site selection, and recruitment of speakers.

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EDI will prepare fact sheets on energy efficiency, environmental compliance, and pollution prevention methodologies. These fact sheets will identify common environmental management problems and provide information requirements, economic justifications, and sources for additional materials.

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Task 5. Industry Networks

EDI will develop regionally based system of industry networking groups. The purpose of these groups is to promote information exchange, problem solving, and mentoring among neighbor facilities. EDI will enlist the support and assistance of trade organizations, and/or local chambers of commerce. As many as nine industry networking groups may be developed through EDI regional offices around the state:

EDI will participate in the development of a pollution prevention excellence recognition (Pollution Prevention Partners) program including promotion and award recipient(s) screening.

2.0 Project Reports, Budget Status & Program Schedules: One Year
SERA Agreement

2.1 Program Activities for the November 1996 - January 1997 Quarter

This section describes activities that have occurred during the captioned quarter. A perspective of how these items compare to the goals in the contract as depicted in the program schedule is presented in Section 2.2.

2.1.1 On-Site Assessments

The primary mission of the this quarter is providing on-site assessments, in-plant consultations, and workshops/seminars as well as to continue internal training for GEP field agents. The individuals listed below from Georgia Tech Economic Development Institute (EDI) and Georgia Tech Research Institute (GTRI) compose the GEP/EDI team:

John Adams (Program Coordinator) Atlanta, GA (404)894-4138	Jerry Zolkowski Dalton, GA (706)272-2702
Mike Brown Atlanta, GA (404)894-6107	Steve Cowart Douglas, GA (912)384-1121
Bill Meffert Atlanta, GA (404)894-3844	Paul Schlumper Atlanta, GA (404)894-8082
Ed Hardison Albany, GA (912)430-4188	Chris Downing Griffin, GA (770)412-4081
Robert Hitch Columbus, GA (706)568-2482	George Lee Macon, GA (912)751-6190
Roc Tshirhart Atlanta, GA 894-8045	Russ Ray Atlanta, GA 894-8058
Jim Walsh Atlanta, GA 894-3806	Deann Desai Atlanta, GA 894-24883

These individuals have been selected for their location, technical background and resources they bring to the program. Because of widely varying backgrounds of GEP staff, an internal training program of technical sessions conducted every few months is underway in an effort to standardize the services offered by each of the team members. These sessions have been held on April 24-25, August 28-29, December 12 and a fourth session planned for May 21, 1997. In addition, all staff members are invited and encouraged to attend the numerous workshops produced by GEP.

Headed by Bob Hitch, GEP has completed the development phase of an industry specific pollution prevention audit tool which will further enable field agents (with minimal pollution of prevention expertise) to offer a consistent framework for in-plant assessments. The tool is presently in the alpha test stage with the more skillful GEP members using it during their regular in-plant consultations. Final modifications will be incorporated during the fourth quarter of the program based on the experiences of the in-plant testing. After a training session tentatively scheduled for July 17, 1997, the tool will be available for use by all GEP members as well as all 18 EDI regional offices. We even plan to market the tool to other state pollution prevention divisions and NIST manufacturing extension partnerships. Note: The tool is not designed to offer the level of detail that is typically provided by experts, but it will offer a greater depth and level of consistency than could be expected by only providing general field agent training.

Coordination of in-plant assessments is made with Pollution Prevention Assistance Division (P²AD). The general practice has been established to route facility assistance requests through P²AD. These requests are then evaluated with EDI responding to those requests forwarded for field agent support. In addition, field agents respond to local requests as a matter of routine. These routine requests involve a wide range of support from locating recycling vendors to developing model Title V Air Permit applications for carpet manufacturers.

EDI/GEP on-site assessments performed and/or in-progress this quarter include:

- Caron Spinning, Inc. - Energy and waste minimization study
- Blue Circle Aggregates - Energy and waste minimization study
- BASF - Energy and waste minimization study
- United Controls International, Inc. - Energy and waste minimization study
- House Parts, Inc. - Energy and waste minimization study
- World Carpets, Spinning - Energy and waste minimization study
- World Carpets, Manufacturing - Energy and waste minimization study
- Gourmet Concepts, Inc. - Energy and waste minimization study
- Lacey Mills, Inc. - Energy and waste minimization study
- Patterson Pump, Inc. - Energy and waste minimization study
- Springs Industries - Energy and waste minimization study

EDI/GEP in-plant assessments performed and/or in-progress this quarter (continued):

Columbus Foundries, Inc. - Energy and waste minimization study
Shaw Industries - Energy and waste minimization study
Southeastern Forge, Inc. - Energy and waste minimization study
Universal Rundle, Inc. - Energy and waste minimization study
Atlas Roofing, Inc. - Energy and waste minimization study
Sola Electric - Energy and waste minimization study
U.S. Gypsum Corp. - Energy and waste minimization study
Oriental Weavers of America - Energy and waste minimization study
Perception Corporation - Energy and waste minimization study
Horton Homes, Inc. - Indoor air emissions analysis
Toppan Interamerica, Inc. - Energy and waste minimization study
Ru Wood, Inc. - Wood waste reuse consultation
Carrier Transicold - ISO 14000 Baseline audit
AT&T - ISO 14000 Gap Analysis
Harrell Manufacturing, Inc. - Environmental compliance consultation
Sunnyland Farms - Stormwater consultation
AAA Cleaning, Inc. - Recycle pecan hulls consultation
Rustan, Inc. - Wastewater treatment consultation
Rogers Finishing - Air emissions consultation
Miller-Zell, Inc. - Energy and waste minimization study
Fresh Express, Inc. - Energy and waste minimization study
Peachtree Metals, Inc. - Energy and waste minimization study
Formetco - Energy and waste minimization study
Purcell Industries - Energy and waste minimization study
Sundor Brands - Energy and waste minimization study

EDI/GEP in-plant assessments planned for next quarter include:

Completion of projects in-house
Epps Aviation - Energy and waste minimization study
Brake Pro, Inc. - Energy and waste minimization study
Darworth Inc. - Compressed air system analysis for expansion
Brake Pro, Inc. - Energy and waste minimization study
Kimoto Tech Inc. - Energy and waste minimization study
Dittler Brothers, Inc. - Energy and waste minimization study
Dittler Brothers, Inc. - Energy and waste minimization study
Habersham Metal Products, Inc. - Energy and waste minimization study
Belt Corp. of America, Inc. - Energy and waste minimization study
Alken-Ziegler, Inc. - Energy and waste minimization study

2.1.2 Sector Specific Training

For sector specific training endeavors, see the various sections below.

2.1.3 Regional Seminars

Group technology transfer preparation and production for state regions is as indicated below:

- “ISO 14000 International Standards Internal Auditing” (01/30-31/97)
- “ISO 14000 International Standards Systems Documentation” (Planned for 02/11-12/97)
- “Power Demand Management” (11/14/96, Planned for 2/11/97, 5/13/97)
- “Boilers and Steam Systems” (Planned for 02/20/97, 05/06/97)
- “Pollution Prevention: Emerging Opportunities to Reduce Costs in Industry”
(Planned for 03/11/97)

2.1.4 Industry Sector Seminars Produced This Quarter

Group technology transfer preparation and production for specific industry sectors is as indicated below:

- “Energy Efficiency and Waste Reduction in the Carpet Industry” (11/7/96)
- “Waste Water Pretreatment for Carpet Companies” (01/23/96)
- “Solvent Reduction in the Carpet Industry” (planned for 02/06/97)
- “Energy Efficiency and Waste Reduction in the Plastics Industry” (planned for 03/13/97)
- “Energy Efficiency and Waste Reduction in the Textile Industry” (planned for 04/24/97)

2.1.5 Awareness Events

Last quarter, EDI supported P²AD efforts to construct a full size (8’x10’) trade show booth and a brochure for the GEP. The booth and brochure were completed in September. Participation in awareness events with the booth is focused in trade shows, expositions, and conferences includes:

- The Bobbin Show International (10/1-4/96)
- Environmental Management Forum (10/21-23/96)
- World Energy Engineering/The Environmental Technology Expo/Plant
and Facilities Expo (11/6-8/96)

2.1.6 Database Information Input

The environmental database development effort is headed by the University of Georgia. EDI provides support to the effort. The leader in support of this effort for EDI is John Adams. Support for this project component is as requested/as needed and ongoing.

2.1.7 Savannah River Plant Interface

Support for this project component is as requested/as needed and ongoing. Support for this program component is headed by John Adams.

2.1.8 Project Administration

This program is co-directed by John Adams and Ned Ellington. Day to day project administration and resource management is performed by John Adams.

2.2 Program Schedule

Exhibit 2.2.A, attached, summarizes EDI's performance on the program. It also shows the contract deliverables and current program status.

2.3 Budget Summary

Exhibit 2.3.A, attached, depicts EDI's cost performance on the program. The chart represents current and planned expenditures.

3.0 Project Reports, Budget Status & Program Schedules: P²AD Support Services Agreement

3.1 Program Activities for the August 1996 - October 1996 Quarter

3.1.1 On-site Assessments

On-site assessments produced in concert with P²AD for the program to date include:

World Carpets Manufacturing of Dalton
Initial Visit: 10/30/96
Anticipated Project Completion: March 1997

World Carpets Spinning of Dalton
Initial Visit: 10/30/96
Anticipated Project Completion: March 1997

Blue Circle Aggregates
Initial Visit: 12/13/96
Anticipated Project Completion: February 1997

Blue Circle Cement
Initial Visit: 01/14/96
Anticipated Project Completion: February 1997

3.1.2 Pollution Prevention Workshops

Workshops produced in concert with P²AD for the program to date include:

“Wood Finishers and Furniture Manufacturers Workshop and Teleconference”
Conducted on: 9/18/96 and 9/25/96
Attendance: 134

“Georgia Printer Partnership - Increasing Profits and Reducing Waste”
Conducted on: 01/21/97
Attendance: 63

Task #	Description	Month(1)(3)										Project Totals	Project Goals	
		1	2	3	4	5	6	7	8	9	10			
1	On-Site Assessments	6	6	6	3	4	1						26	25
2	Sector Specific Training				1		1	1	1	1			5	25
3	Regional Seminars			2	1		1	4	1		3		12	12
4	Industry Sector Training		1		1		1	1	1	1			6	2
5	Awareness Events			2	1								3	3
6	Database Information Input (2)	000	000	000	000	000	000	000	000	000	000			000
7	SRP Interface (2)	000	000	000	000	000	000	000	000	000	000			000
8	Project Administration (2)	000	000	000	000	000	000	000	000	000	000			000

(1) Program formally initiated in August 1996. Planned completion date is June 30, 1997.

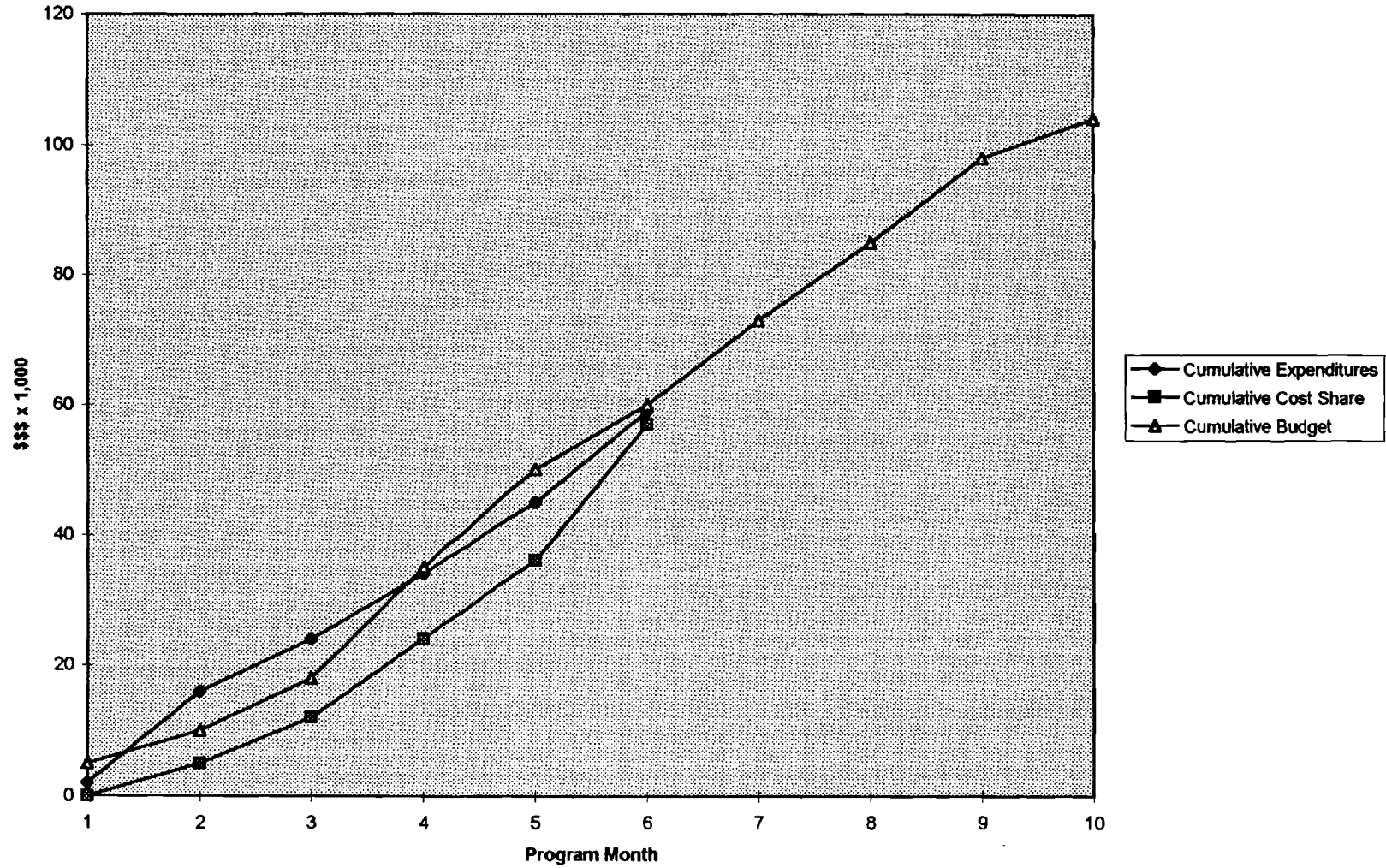
(2) Ongoing support as needed

(3) Data actual through month 6 and projected through month 12.

One Year SERA Agreement Program Schedule and Accomplishments

Table 2.2.A

Exhibit 2.3.A
One Year SERA Agreement Budget Summary



3.1.3 Industry Networks

Development and production of pollution prevention networks in industry has been launched this quarter. We have selected eight sites for the initial network development efforts. These initial meetings will include speaker/discussion leaders provided by GEP. Future meetings are expected to provide a broad range of speakers and discussion leaders including local member testimonies. This endeavor is being lead by Ms. Deann Desai.

Year one network development activity includes:

Round One Theme: *SARA Reporting & Pollution Prevention Partners Program*

<u>Location</u>	<u>Date Planned</u>
Dalton	02/10/97
Athens	02/21/97
Augusta	02/14/97
Macon	02/17/97
Columbus	02/13/97
Albany	02/24/97
Douglas	02/26/97
Savannah	02/28/97

Round Two Theme: *Form R Reporting & Pollution Prevention Partners Program*

<u>Location</u>	<u>Date Planned</u>
Dalton	06/03/97
Athens	06/05/97
Augusta	06/16/97
Macon	06/19/97
Columbus	06/09/97
Albany	06/20/97
Douglas	06/23/97
Savannah	06/26/97

Round Three Theme: *TBA*

<u>Location</u>	<u>Date Planned</u>
Dalton	09/08/97
Athens	09/15/97
Augusta	09/22/97
Macon	09/29/97
Columbus	10/14/97
Albany	10/06/97
Douglas	10/20/97
Savannah	10/27/97

3.1.4 Pollution Prevention Partners (P³) Certification Program

Support for this project component is ongoing on an as needed basis. The EDI field agents have been made aware of the program and brochures have been distributed to each office. Additional training is planned to enable field agents to provide in-plant support, verification, and applicant recruitment. Support for this program component is headed by John Adams.

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4.0 Plans for the Next Quarter

Activities planned for next quarter include continuation of the activities listed above. Efforts will also be focused on developing/establishing industry networks utilizing the information gained this quarter and providing a higher rate of deployment of on-site assessments.

Task #	Description	Month(1)(3)										Project Totals	Project Goals	
		1	2	3	4	5	6	7	8	9	10			
1	On-Site Assessments			2		1	1						4	15
2	P2 Workshops		1				1				1		3	2
3	Industry Networks							8					8	9
4	P3 Program Support (2)	000	000	000	000	000	000	000	000	000	000	000		

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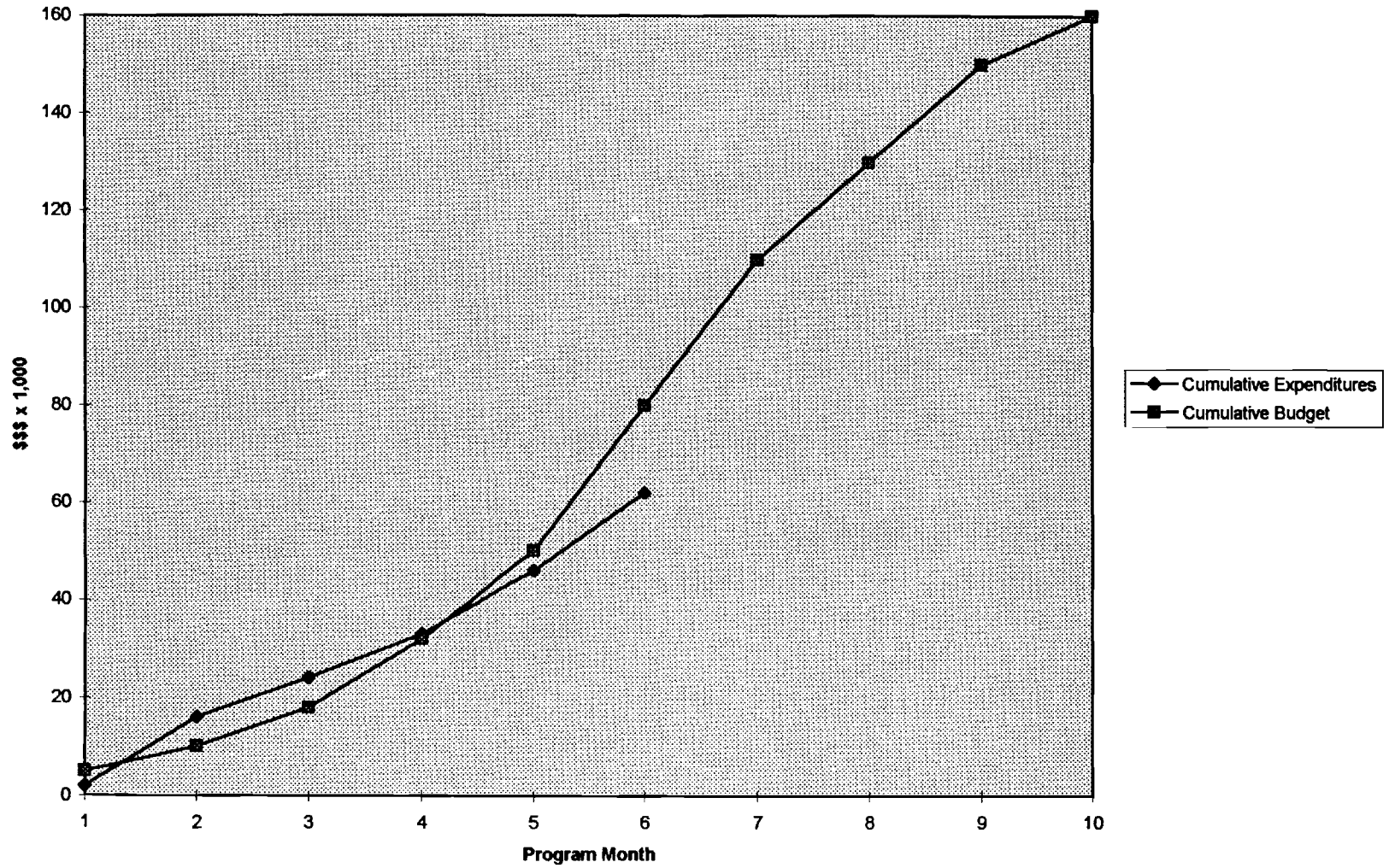
(2) Ongoing support as needed.

(3) Data actual through month 6 and projected through month 12.

P2AD Support Services Agreement Program Schedule and Accomplishments

Table 3.2.A

Exhibit 3.3.A
P2AD Support Services Agreement



**Georgia
Tech**



**Economic
Development
Institute**

Center for Process Optimization

N-20-601 = 1
N-20-602 = 3

Mr. Greg Andrews
Program Manager
Georgia Pollution Prevention Assistance Division
Suite 450
7 Martin Luther King Jr. Dr.
Atlanta GA 30334-9004

May 8, 1997

**SUBJECT: Contract N-20-601: ONE YEAR SERA AGREEMENT and
Contract N-20-602: P²AD SUPPORT SERVICES AGREEMENT
Quarterly Report; Performance Period February 1997 - April 1997**

Dear Mr. Andrews:

Please find the captioned report of Georgia Tech activities for your review. I trust our performance meets your expectations. Please call if you have questions or comments.

Respectfully Submitted,

/ John C. Adams, P.E.
Georgia Environmental Partnership
Georgia Tech Economic Development Institute

Enclosures

cc: Dr. Edward P. Ellington, Director
 Management Services, Georgia Tech Economic Development Institute
 Dr. David S. Clifton, Director
 Center for International Standards and Quality
 Dr. Jackie Sellers, Public Services Associate
 Driftmier Engineering Center, University of Georgia
 Georgia Tech GEP staff

Economic Development Institute
Center for Process Optimization
142 O'Keefe Building
Atlanta, GA 30332-0640 U.S.A.
PHONE 404•894•6101
FAX 404•894•0291

Quarterly Progress Report

**ONE YEAR SERA AGREEMENT
and
P²AD SUPPORT SERVICES AGREEMENT**

**Contract Number: Contract N-20-601 and Contract N-20-602
Performance Period: February 1997 - April 1997**

Sponsored By:

**GEORGIA POLLUTION PREVENTION ASSISTANCE DIVISION
Suite 450
7 Martin Luther King Jr. Dr.
Atlanta GA 30334-9004**

Submitted By:

**Georgia Tech Economic Development Institute
Georgia Institute of Technology
Atlanta GA 30332-0640**

May 8, 1997

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3. Project Reports, Budget Status & Program Schedules: P ² AD Support Services Agreement	8
4. Plans for the Next Quarter	13

1.0 Executive Summary (Printed in each quarterly report)

This document defines the scope of work and progress of the Georgia Tech Economic Development Institute (EDI) and Georgia Tech Research Institute (GTRI) in concert with the Pollution Prevention Assistance Division (P²AD) and the University of Georgia in establishing and operating the Georgia Environmental Partnership (GEP) via funding provided by the Southeastern Environmental Resources Alliance (SERA), P²AD, and in-house cost share. This program is made possible via two contracts with the Georgia Tech Research Corporation: "One Year SERA Agreement" and "P²AD Support Services Agreement". Even though these are two unique contracts with unique deliverables, for the purposes of report brevity, the delivery of effort under the agreements is combined below in a single report outlining our GEP efforts. Because these efforts are in partnership with the two other operations listed above, we acknowledge the efforts reported below involve the other members of the partnership where the lead role and source of success may well be any one of the three partners.

The following program tasks generalize the overall effort:

Task 1. Technical Assistance

EDI will provide general environmental assessments to individual companies in the form of on-site assessments at industrial facilities throughout Georgia. These assessments are designed to identify potential energy efficiency, environmental compliance, and/or pollution prevention concerns. On-site assessments will be conducted at numerous plants using EDI's existing staff of field agents and skill center specialists.

The assessments will be preliminary in nature (feasibility grade) requiring 2-3 man days of effort each. More complex or involved assessments (requiring detailed analysis of pollution prevention concepts, measures, and technologies) will be referred to P²AD's pollution prevention staff engineers, especially where broad application of the results in the state is desirable.

Task 2. Regional Seminars

EDI will conduct geographically based seminars. Development and planning functions will be coordinated with P²AD's public outreach coordinators. Seminars will deal with topics germane to the needs of Georgia industries. EDI will arrange meeting space, marketing services, and informational materials through its network of regional offices.

Task 3. Industry Sector Seminars

EDI will assist P²AD in the development of three industry sector specific seminars. EDI will identify speakers and develop materials as requested by P²AD with particular emphasis on matters relating to industrial energy efficiency and environmental compliance. P²AD will assume primary responsibility for the presentation of information pertaining to pollution prevention measures and technologies. EDI, in conjunction with P²AD's public outreach coordinators, will be responsible for the planning and logistical support for the seminars, including but not limited to, advertising, site selection, and recruitment of speakers.

Task 4. Support and Promotion

EDI will provide training, resource identification/referral and management support, where appropriate, in support of implementation projects conducted by SERA in Georgia.

EDI will prepare fact sheets on energy efficiency, environmental compliance, and pollution prevention methodologies. These fact sheets will identify common environmental management problems and provide information requirements, economic justifications, and sources for additional materials.

EDI will participate in trade shows and conferences to promote the environmental management services provided by the Georgia Partners. This task will include the operation of exhibits and information booths and the delivery of presentations at environmental conferences throughout the region.

Task 5. Industry Networks

EDI will develop a regionally based system of industry networking groups. The purpose of these groups is to promote information exchange, problem solving, and mentoring among neighboring facilities. EDI will enlist the support and assistance of trade organizations, and/or local chambers of commerce. As many as nine industry networking groups may be developed through EDI regional offices around the state.

EDI will participate in the development of a pollution prevention excellence recognition (Pollution Prevention Partners) program including promotion and award recipient(s) screening.

2.0 Project Reports, Budget Status & Program Schedules: One Year SERA Agreement

2.1 Program Activities for the November 1996 - January 1997 Quarter

This section describes activities that have occurred during the captioned quarter. A perspective of how these items compare to the goals in the contract as depicted in the program schedule is presented in Section 2.2.

2.1.1 On-Site Assessments

The primary mission of this quarter has been providing on-site assessments, in-plant consultations, workshops/seminars and the development of on-site assessment tools. Also, we will continue internal training of GEP field agents. The individuals listed below from Georgia Tech Economic Development Institute (EDI) and Georgia Tech Research Institute (GTRI) compose the GEP/EDI team:

John Adams (Program Coordinator) Atlanta, GA (404)894-4138	Jerry Zolkowski Dalton, GA (706)272-2702
Mike Brown Atlanta, GA (404)894-6107	Steve Cowart Douglas, GA (912)384-1121
Bill Meffert Atlanta, GA (404)894-3844	Paul Schlumper Atlanta, GA (404)894-8082
Ed Hardison Albany, GA (912)430-4188	Chris Downing Griffin, GA (770)412-4081
Robert Hitch Columbus, GA (706)568-2482	George Lee Macon, GA (912)751-6190
Roc Tshirhart Atlanta, GA (404)894-8045	Russ Ray Atlanta, GA (404)894-8058
Jim Walsh Atlanta, GA 894-3806	Deann Desai Atlanta, GA (404)894-2483
Alan Barfoot Dublin, GA (912) 275-6543	

These individuals have been selected for their location, technical background and resources they bring to the program. Because of widely varying backgrounds of GEP staff, an internal training program of technical sessions conducted every few months is underway in an effort to standardize the services offered by each of the team members. These sessions have been held on April 24-25, August 28-29, December 12 and sessions planned for May 12 and July 17-18, 1997. In addition, all staff members are invited and encouraged to attend the numerous workshops produced by GEP.

Headed by Bob Hitch, GEP has completed the development phase of an industry specific pollution prevention audit tool which will further enable field agents (with minimal pollution of prevention expertise) to offer a consistent framework for in-plant assessments. See Attachment I for the latest draft of the tool. Also in – process is an energy usage assessment tool under the direction of Mike Brown. These tools are presently in the beta test stage with the more skillful GEP members using them during their regular in-plant consultations. Final modifications will be incorporated during the fourth quarter of the program based on the experiences of the in-plant testing. After a training session tentatively scheduled for July 17-18, 1997, the tools will be available for use by all GEP members. We even plan to market the tools to other state pollution prevention divisions and NIST manufacturing extension partnerships. Note: The tools are not designed to offer the level of detail that is typically provided by experts, but it will offer a greater depth and level of consistency than could be expected by only providing general field agent training.

In-plant assessments is made in coordination with Pollution Prevention Assistance Division (P²AD). The general practice has been established to route facility assistance requests through P²AD. These requests are then evaluated with EDI responding to those requests forwarded for field agent support. In addition, field agents respond to local requests as a matter of routine. These routine requests involve a wide range of support from locating recycling vendors to developing model Title V Air Permit applications for carpet manufacturers.

EDI/GEP on-site assessments performed and/or in-progress this quarter include:

- Foster Lumber - Utility purchase, environmental compliance plan, and waste minimization study
- Thomas Packing - Energy and waste minimization study
- Dittler Brothers, Inc. - Energy and waste minimization study
- American Dehydrated Foods - Energy and waste minimization study
- Rayloc NAPA - Energy and waste minimization study
- Darworth Manufacturing - Compressed air efficiency analysis
- Blue Circle Cement - Compressed air survey and storm water quality assessment
- Blue Circle Aggregates - Energy and waste minimization study

EDI/GEP in-plant assessments performed and/or in-progress this quarter (continued):

BASF - Energy and waste minimization study
United Controls International, Inc. - Energy and waste minimization study
House Parts, Inc. - Energy and waste minimization study
World Carpets, Spinning - Energy and waste minimization study
World Carpets, Manufacturing - Energy and waste minimization study
Lacey Mills, Inc. - Energy and waste minimization study
Springs Industries - Energy and waste minimization study
Shaw Industries - Energy and waste minimization study
Atlas Roofing, Inc. - Energy and waste minimization study
U.S. Gypsum Corp. - Energy and waste minimization study
Horton Homes, Inc. - Indoor air emissions analysis
Toppan Interamerica, Inc. - Energy and waste minimization study
Ru Wood, Inc. - Wood waste reuse consultation
Carrier Transicold - ISO 14001 Baseline audit
AT&T - ISO 14001 Gap Analysis
Harrell Manufacturing, Inc. - Environmental compliance consultation
Sunnyland Farms - Stormwater consultation
AAA Cleaning, Inc. - Recycle pecan hulls consultation
Rustan, Inc. - Wastewater treatment consultation
Rogers Finishing - Air emissions consultation
Blue Circle Cement - ISO 14001 gap analysis
J.H. Williams Co. - ISO 14001 audit
Plicon - Environmental compliance & 7(c)1 audit
Pratt & Whitney - Waste min. Assessment
Tom's Foods - Waste min. Assessment
Rogers' Finishing - Energy/waste audit and Prep of a Generic Stormwater Pollution Prevention Plan

EDI/GEP in-plant assessments planned for next quarter include (pending on facility operating information being made available):

Star Packaging - Improved industrial fume exhaust system design
Semco Manufacturing - Study for a laboratory energy recovery system
Gourmet Concepts, Inc. - Energy and waste minimization study
Epps Aviation - Energy and waste minimization study
Universal Rundle, Inc. - Energy and waste minimization study
Brake Pro, In. - Energy and waste minimization study
Kimoto Tech Inc. - Energy and waste minimization study
Habersham Metal Products, Inc. - Energy and waste minimization study

EDI/GEP in-plant assessments backlog planned for next quarter include (pending on facility operating information being made available) - Continued:

Belt Corp. of America, Inc. - Energy and waste minimization study
Alken-Ziegler, Inc. - Energy and waste minimization study
Patterson Pump, Inc. - Energy and waste minimization study
Columbus Foundries, Inc. - Energy and waste minimization study
Southeastern Forge, Inc. - Energy and waste minimization study
Sola Electric - Energy and waste minimization study
Oriental Weavers of America - Energy and waste minimization study
Perception Corporation - Energy and waste minimization study
Callaway Chemical - Waste minimization assessment
Cessna Aircraft Components - Waste minimization assessment
AAA Modular Buildings - Waste minimization assessment

EDI/GEP information requests and consultations provided this quarter include:

AFLAC - Info request on printing waste minimization
Columbus Productions - Info request on printing waste minimization
Community Grading & Construction - Info request on Asbestos removal literature
Consolidated Engineering & Robotics - Provided synopsis of US Environmental & OSHA laws
Georgia Packaging - Info request on printing waste minimization
Advanced Flooring - project to find uses for waste carpet
Georgia Linen Exchange - SARA Title III forms/info.
RailRunner – Reduction in cargo transport/handling consultation
Mohawk - Measurements of energy waste from the carpet dye and coating lines
Carriage Carpets - Measurements of energy waste from the carpet dye and coating lines
Wood Tech - Assess compliance for air permits and SARA Title III - Form R's
Courier - Tier II consultation
The Andersen Company – Consultation on Air permit determination, Tier II reports, and Stormwater NOI
World Carpet - Air permit amendment consultation

2.1.2 Sector Specific Training

For sector specific training endeavors, see the various sections below.

2.1.3 Regional Seminars

Group technology transfer preparation and production for state regions is as indicated below:

- “ISO 14000 Overview”, 2/11
- “ISO 14000 International Standards Systems Documentation”, 02/11-12
- “Power Demand Management”, 2/11, 5/15
- “Boilers and Steam Systems”, 2/20, 4/22, 05/06
- “SARA Title III Workshop”, April ‘1997
- “Solvent Management”, April ‘97
- “Shop Talk – Metal Finishing Made a Little Easier”, May 28
- “The New Wetlands Rules”, April
- “Solvent Reduction in the Carpet Industry”, February 6
- “Manufacturing Excellence Conference: Best Practices for the 21st Century”, Planned for September 11-12, 1997

2.1.4 Awareness Events

EDI provides ongoing support to P²AD by participating in awareness events via manning our GEP trade show booth. This quarter the booth was manned at the following events:

- “Georgia Water Resources Conference”, Athens, March 18-21
- “Georgia Water Pollution Control Conference”, Atlanta, March 25-26

2.1.6 Database Information Input

The environmental database development effort is headed by the University of Georgia. EDI provides support to the effort. The leader in support of this effort for EDI is John Adams. Support for this project component is as requested/as needed and ongoing.

2.1.7 Savannah River Plant and SERA Interface

Support for this project component is as requested/as needed and ongoing. Support for this program component is headed by John Adams. During this quarter, Mr. Adams attended two SERA Board meetings.

2.1.8 Project Administration

This program is co-directed by John Adams and Ned Ellington. Because of a recent administrative change, Mr. Ellington's responsibilities will be delegated to Dr. David Clifton. Mr. Ellington will remain available in an advisory capacity. Day to day project administration and resource management will continue to be performed by John Adams.

2.2 Program Schedule

Exhibit 2.2.A, attached, summarizes EDI's performance on the program, effective April 30. It also shows the contract deliverables and current program status.

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Exhibit 2.3.A, attached, depicts EDI's cost performance on the program, effective March 31 (April accounting data is not available at the time of this writing). The chart represents current and planned expenditures.

3.0 Project Reports, Budget Status & Program Schedules: P²AD Support Services Agreement

3.1 Program Activities for the February 1997 - April 1997 Quarter

3.1.1 On-site Assessments

On-site assessments produced in concert with P²AD for the program to date include:

Atlanta Film Converting
Initial Visit: 4/18/96
Project Completion: 6/24/96

World Carpets Manufacturing of Dalton
Initial Visit: 10/30/96
Project Completion: May 1997

On-site assessments produced in concert with P²AD for the program continued:

World Carpets Spinning of Dalton
Initial Visit: 10/30/96
Anticipated Project Completion: May 1997

Blue Circle Aggregates
Initial Visit: 12/13/96
Project Completion: March 1997

Blue Circle Cement
Initial Visit: 01/14/96
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Lacey Mills
Initial Visit: 4/23/97
Anticipated Project Completion: June 1997

3.1.2 Pollution Prevention Workshops

Workshops produced in concert with P²AD for the program to date include:

“Wood Finishers and Furniture Manufacturers and Furniture Manufacturers Workshop and Teleconference”

Conducted on: 9/18/96 and 9/25/96
Attendance: 134

“Georgia Printer Partnership - Increasing Profits and Reducing Waste”

Conducted on: 01/21/97
Attendance: 63

“Shop Talk – Metal Finishing Made a Little Easier”

Planned for May 28, 1997

“Pulp and Paper Mill Pollution Prevention”

Planned for September 19, 1997

Task	Description	Month(1)(3)(4)												Project Totals	Project Goals	
		1	2	3	4	5	6	7	8	9	10	11	12			
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2	Sector Specific Training				1		1	1						1	4	25
3	Regional Seminars			2	1		1	4	1			3		3	15	12
4	Industry Sector Training		1		1		1	1	1	1					6	2
5	Awareness Events			2	1										3	3
6	Database Information Input (2)	000	000	000	000	000	000	000	000	000	000					000
7	SRP Interface (2)	000	000	000	000	000	000	000	000	000	000					000
8	Project Administration (2)	000	000	000	000	000	000	000	000	000	000					000

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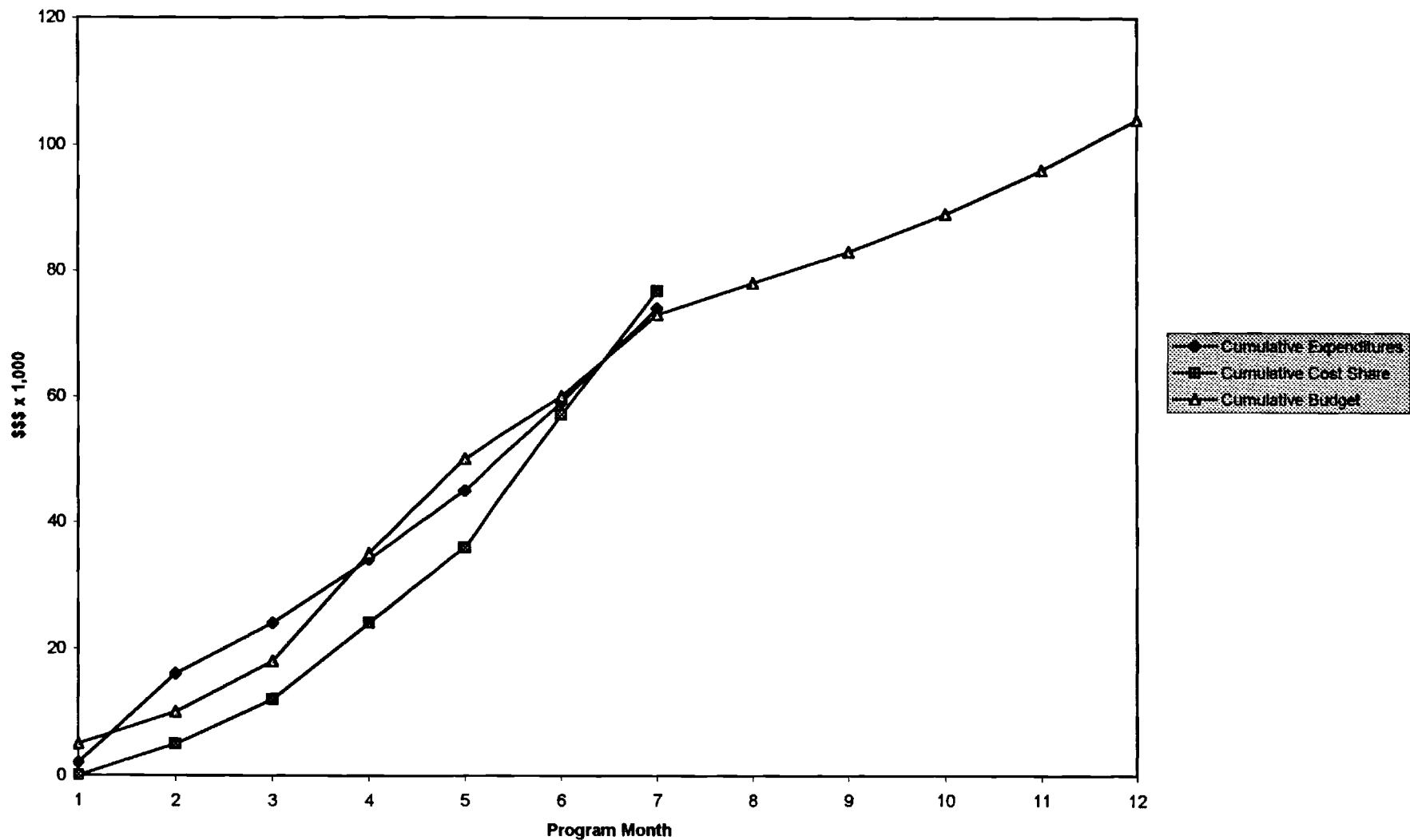
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<u>Location</u>	<u>Date Planned</u>
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Columbus	02/13/97
Albany	02/24/97
Douglas	02/26/97
Savannah	02/28/97

Round Two Theme: *Form R Reporting & Pollution Prevention Partners Program*

<u>Location</u>	<u>Date Planned</u>
Dalton	TBA
Athens	06/10/97
Augusta	06/17/97
Macon	06/19/97
Columbus	06/10/97
Albany	06/11/97
Douglas	06/20/97
Savannah	06/18/97
Cartersville	05/29/97
Morrow	06/03/97
LaGrange	06/10/97

Round Three Theme: *TBA*

<u>Location</u>	<u>Date Planned</u>
Dalton	09/08/97
Athens	09/15/97
Augusta	09/22/97
Macon	09/29/97
Columbus	10/14/97
Albany	10/06/97
Douglas	10/20/97
Savannah	10/27/97
Cartersville	TBA
Morrow	TBA
LaGrange	TBA

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Support for this project component is ongoing on an as needed basis. The EDI field agents have been made aware of the program and brochures have been distributed to each office. Additional training is planned to enable field agents to provide in-plant support, verification, and applicant recruitment. Support for this program component is headed by John Adams.

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Task	Description	Month(1)(3)(4)												Project Totals	Project Goals
		1	2	3	4	5	6	7	8	9	10	11	12		
1	On-Site Assessments	1		2		1	1	2	2	2	2	1	1	15	15
2	P2 Workshops		1				1			1			1	4	2
3	Industry Networks Meetings						8			11			11	30	24
4	P3 Program Support (2)	000	000	000	000	000	000	000	000	000	000	000	000		

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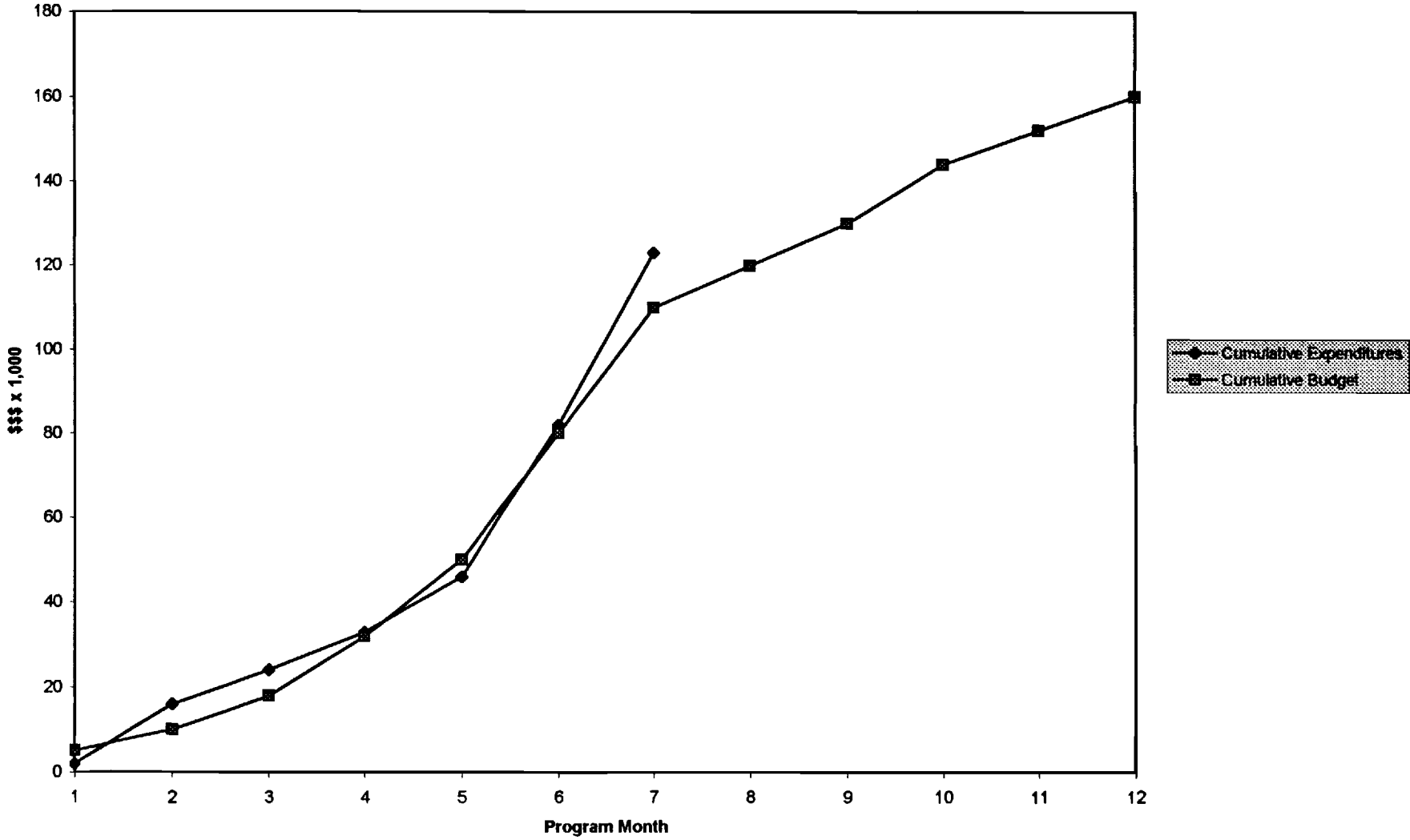
(2) Ongoing support as needed.

(3) Data actual through month 7 and projected through month 12.

P2AD Support Services Agreement Program Schedule and Accomplishments

Table 3.2.A

Exhibit 3.3.A
P2AD Support Services Agreement



Attachment I

Waste Minimization Assessment Tool (Draft)

Index

	<i>Pre-visit</i>
Company Information	1
Current Status	2
	<i>During Visit</i>
1. General Practices / Waste Sources	3
<i>Industry Specific sections [select those appropriate for the firm]:</i>	
2. Metal Fabrication	6
3. Paint Coating Metal Finishing [plating]	8
4. Commercial Printing.....	10
5. Fiberglass-reinforced and Composite plastics	12
6. Pharmaceuticals.....	13
7. Printed Circuit Boards	15
8. Wood Treatment.....	19
9. Plastic Molding	20
10. Chemical Manufacturing / Formulating	21
11. Metal Casting / Heat Treating	25
12. Textiles	27
13. Food Processing	

Scoring Guide

<u>Score</u>	<u>Indicates</u>
--------------	------------------

- ① No systematic approach is seen, information is anecdotal only.
- ② Systematic approach is beginning; in the early stages of a transition to the item; major gaps exist in deployment that inhibit progress in achieving the purpose.
- ③ A sound systematic approach is seen; fact-based improvement processes are in place; no major deployment gaps, but some areas are in early stages.
- ④ The systematic approach responds to overall intent of the item; fact-based improvement is a primary tool, clear evidence of refinement through analysis cycles; well-deployed approach, no major gaps, may vary among work areas.
- ⑤ Sound systematic approach, fully responsive; strong fact-based improvement process backed by excellent analysis; item is fully deployed without significant weakness or variation.

Heavily darken entire circle to show score selection, line out to show not applicable.

Waste Reduction Assessment



Company Information

Company: _____	date: _____	Contact: _____
Location: _____		

Street Address: _____
City: _____
State: _____
Telephone: / Fax: _____

Major Products: _____	Sales \$: _____	% to Government: _____
SIC Code(s): _____	_____	_____

Major Unit: _____
Product or Service: _____
Ownership: <input type="checkbox"/> Single <input type="checkbox"/> Multi-GA <input type="checkbox"/> Multi-US <input type="checkbox"/> International

Largest four waste streams by cost :	Processes involved:
1. _____	_____
2. _____	
3. _____	
4. _____	
include costs if known	

Largest four waste streams by weight / volume :	Processes involved:
1. _____	_____
2. _____	
3. _____	
4. _____	
include weights / volumes if known	

What are your priorities?:

Waste Reduction Assessment



Current Status

Before getting into the details of waste minimization opportunities for your company, we would like to know about your current waste related activities.

1. Do you have any environmental permits? Please list them for us.

- a. Hazardous Waste Generator Number please provide #: GAD _____.
- b. Air Emissions Permit please provide #: _____.
- c. Other _____ please provide #: _____.
- d. Other _____ please provide #: _____.
- e. Other _____ please provide #: _____.
- f. Other _____ please provide #: _____.

2. Are you using a documented Environmental Management System ? [like ISO14000] ① ② ③ ④ ⑤

3. When was your last visit / inspection from EPA or EPD ? _____

Result? _____

4. How do you currently measure your waste generation?

- Dollars Weight Volume Other _____

5. Which of the following records are available?

- | | |
|---|--|
| <input type="checkbox"/> Process flow diagrams | <input type="checkbox"/> Hazardous waste manifests |
| <input type="checkbox"/> Environmental certification [employee] | <input type="checkbox"/> Training records |
| <input type="checkbox"/> Emissions inventories | <input type="checkbox"/> Waste reduction plan |
| <input type="checkbox"/> Permits / applications | <input type="checkbox"/> Process material balances |
| <input type="checkbox"/> Waste removal invoices | <input type="checkbox"/> Energy invoices |
| <input type="checkbox"/> Product scrap records | <input type="checkbox"/> Facility plot plan |
| <input type="checkbox"/> Material Safety Data Sheets | <input type="checkbox"/> Maintenance records |
| <input type="checkbox"/> Production schedules | <input type="checkbox"/> Raw material identification |
| <input type="checkbox"/> Environmental/Waste Policy | <input type="checkbox"/> Corrective Action records |

6. What in-house recovery / treatment methods do you use, if any?

7. Is the facility connected to Septic system or Public Owned Treatment Works [sewer]

8. Is the facility using Private wells, surface, or City water.

9. Describe your products & annual volume: _____

Waste Reduction Assessment



General Practices

EPA/600/R-92/088

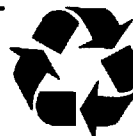
- 1.1 Waste segregation:
 - a) Prevent hazardous wastes from mixing with non-hazardous wastes? ① ② ③ ④ ⑤
 - b) Segregate liquid and solid wastes ? ① ② ③ ④ ⑤
 - c) Label oils and solvents properly / keep from cross contamination? ① ② ③ ④ ⑤
 - d) Use pans, trays or wringable pads instead of granular absorbent? ① ② ③ ④ ⑤
 - e) Segregate materials as generated? ① ② ③ ④ ⑤
- 1.2 Preventative Maintenance:
 - a) Maintain history records on equipment repairs. ① ② ③ ④ ⑤
 - b) Keep manufacturer's manuals available. ① ② ③ ④ ⑤
 - c) Maintain preventative maintenance schedule. ① ② ③ ④ ⑤
- 1.3 Training / Awareness Programs are held :
 - a) Equipment operation to minimize energy / material usage. ① ② ③ ④ ⑤
 - b) Material handling methods to avoid spills. ① ② ③ ④ ⑤
 - c) Economic, legal, and environmental aspects of waste generation. ① ② ③ ④ ⑤
 - d) Detecting and minimizing losses to air, water, & landfill. ① ② ③ ④ ⑤
 - e) Quality control and emergency procedures to minimize lost materials. ① ② ③ ④ ⑤
- 1.4 Supervision:
 - a) Production efficiency measured in terms of raw material use. ① ② ③ ④ ⑤
 - b) Waste management officer appointed. ① ② ③ ④ ⑤
 - c) Section waste management employee teams active / rewarded. ① ② ③ ④ ⑤
 - d) Waste reduction targets are established and known by workers. ① ② ③ ④ ⑤
 - e) Top management established waste management policy. ① ② ③ ④ ⑤
- 1.5 Scheduling / planning:
 - a) Batch sizes optimized to reduce clean up waste. ① ② ③ ④ ⑤
 - b) Equipment dedicated to a single product [avoid cross contamination] ① ② ③ ④ ⑤
 - c) Batches sequenced to minimize cleaning frequency [light-to-dark]. ① ② ③ ④ ⑤
 - d) Direct and indirect costs of air, land, water discharges and treatment directly charged to specific products / processes. ① ② ③ ④ ⑤
 - e) Utility costs allocated to specific processes / products. ① ② ③ ④ ⑤
- 1.6 Office areas
 - a) Paper-less communication systems in place ① ② ③ ④ ⑤
 - b) waste paper segregated by type & recycled ① ② ③ ④ ⑤
 - c) toner / printer cartridges refilled / recycled ① ② ③ ④ ⑤
 - d) duplex [both sides] copying practices used ① ② ③ ④ ⑤
 - e) Heating / Air Conditioning set-back thermostats used ① ② ③ ④ ⑤
 - f) lighting turned off in unoccupied spaces ① ② ③ ④ ⑤
 - g) use washable coffee cups not disposable ① ② ③ ④ ⑤
 - h) encourage reusable lunch containers not disposable ① ② ③ ④ ⑤
 - i) Vending machines do not use disposable cups ① ② ③ ④ ⑤
 - j) Use plain paper fax (treated papers are not recyclable) ① ② ③ ④ ⑤

Waste Reduction Assessment



- 1.7 Receiving area: [packing materials, off-spec., damaged containers, spills, transfer hoses, pallets]
- a) Just-in-time ordering system ① ② ③ ④ ⑤
 - b) package type & quantity to minimize waste ① ② ③ ④ ⑤
 - c) suppliers accept returns of outdated materials ① ② ③ ④ ⑤
 - d) stock rotation used ① ② ③ ④ ⑤
 - e) inspect before accepting shipment, or supplier qualification system ① ② ③ ④ ⑤
 - f) inventory cycle counting ① ② ③ ④ ⑤
 - g) less critical uses for off-spec. materials ① ② ③ ④ ⑤
 - h) reusable containers ① ② ③ ④ ⑤
 - i) rinsable / returnable drums, totes, pails ① ② ③ ④ ⑤
 - j) pallets reused / repaired ① ② ③ ④ ⑤
 - k) containers labeled ① ② ③ ④ ⑤
 - l) use pumps & funnels to transfer liquids ① ② ③ ④ ⑤
- 1.8 Raw material and product storage: [tank bottoms, off-spec. & excess, spill residue, leaking piping systems, damaged containers, empty containers]
- a) Spill prevention Control and Countermeasure plan in place ① ② ③ ④ ⑤
 - b) tanks & vessels used only for intended purposes ① ② ③ ④ ⑤
 - c) overflow alarms on all vessels with automatic filling ① ② ③ ④ ⑤
 - d) physical integrity of vessels maintained ① ② ③ ④ ⑤
 - e) secondary containment areas - allow material recovery ① ② ③ ④ ⑤
 - f) use seal-less pumps ① ② ③ ④ ⑤
 - g) bellows seal valves ① ② ③ ④ ⑤
 - h) all spills documented ① ② ③ ④ ⑤
 - i) conservation type vents used [e.g. floating roof tanks] for VOC control ① ② ③ ④ ⑤
 - j) containers storage allows inspection for integrity ① ② ③ ④ ⑤
 - k) drums stored off concrete [reduce sweating] ① ② ③ ④ ⑤
 - l) empty drums reused / returned ① ② ③ ④ ⑤
 - m) corrugated / scrap paper reused / recycled ① ② ③ ④ ⑤
- 1.9 Operation & Process:
- a) maximize dedication of process equipment ① ② ③ ④ ⑤
 - b) squeegee / mechanical wipers before final rinse ① ② ③ ④ ⑤
 - c) closed storage & transfer systems ① ② ③ ④ ⑤
 - d) sufficient drain time for liquids ① ② ③ ④ ⑤
 - e) line vessels to reduce surface tension ① ② ③ ④ ⑤
 - f) clean-in place systems used ① ② ③ ④ ⑤
 - g) clean immediately after use ① ② ③ ④ ⑤
 - h) reuse / reclaim solvents [distillation] ① ② ③ ④ ⑤
 - i) standardize solvents ① ② ③ ④ ⑤
 - j) schedule to reduce changeovers ① ② ③ ④ ⑤

Waste Reduction Assessment



1.10 Energy use minimization:

Heat exchanger cleaning: [sludge & spent acid]

- | | | | | | |
|--|---|---|---|---|---|
| a) Bypass control or pumped recycle to maintain turbulence in turndown | ① | ② | ③ | ④ | ⑤ |
| b) Smooth heat exchanges surfaces used | ① | ② | ③ | ④ | ⑤ |
| c) on-stream cleaning techniques used | ① | ② | ③ | ④ | ⑤ |
| d) high-pressure replaces chemical cleaning | ① | ② | ③ | ④ | ⑤ |
| e) lowest pressure steam used | ① | ② | ③ | ④ | ⑤ |

1.11 Laboratory: [reagents, off-spec. chemicals, empty sample containers]

- | | | | | | |
|--|---|---|---|---|---|
| a) micro or semi-micro analytical techniques | ① | ② | ③ | ④ | ⑤ |
| b) increase instrumentation [vrs titration] | ① | ② | ③ | ④ | ⑤ |
| c) eliminate highly toxic experiments | ① | ② | ③ | ④ | ⑤ |
| d) recover catalyst metals | ① | ② | ③ | ④ | ⑤ |
| e) treat or destroy hazardous products as last step in procedure | ① | ② | ③ | ④ | ⑤ |
| f) segregate streams | ① | ② | ③ | ④ | ⑤ |
| g) clearly identify all materials | ① | ② | ③ | ④ | ⑤ |
| h) recover / recycle mercury | ① | ② | ③ | ④ | ⑤ |
| i) order exact amounts of reagents, rotate stock | ① | ② | ③ | ④ | ⑤ |

Waste Reduction Assessment



Metal Fabrication Processes

EPA/625/7-90/006

- 2.1 Machining / stamping (cutting fluids, oils, metal chips, dust, sludge)
 - a) use long life (high quality) cutting fluid / lubricants ① ② ③ ④ ⑤
 - b) use demineralized make up water ① ② ③ ④ ⑤
 - c) schedule sump & machine cleaning ① ② ③ ④ ⑤
 - d) schedule gasket, seal, & wiper maintenance ① ② ③ ④ ⑤
 - e) filter, pasteurize or treat fluid for reuse ① ② ③ ④ ⑤
 - f) assign fluid control responsibility [one person] ① ② ③ ④ ⑤
 - g) standardize fluid types [all machines] ① ② ③ ④ ⑤
 - h) use insoluble borates instead of soluble borates ① ② ③ ④ ⑤
 - i) segregate & reuse scrap metal ① ② ③ ④ ⑤
 - j) centrifuge [or compress] chips to remove fluids ① ② ③ ④ ⑤
- 2.2 Parts cleaning (solvents)
 - a) lids used on all containers ① ② ③ ④ ⑤
 - b) sufficient freeboard space on tanks ① ② ③ ④ ⑤
 - c) freeboard chillers and drains used ① ② ③ ④ ⑤
 - d) frequent removal of tank sludge ① ② ③ ④ ⑤
 - e) parts pre-cleaned [wipe, blowers, pre-dip] ① ② ③ ④ ⑤
 - f) reclaim / recover solvents on [or off] site ① ② ③ ④ ⑤
 - g) good parts distribution on racks [minimize fluid hold up] ① ② ③ ④ ⑤
 - h) slow removal of parts from vapor zone ① ② ③ ④ ⑤
 - i) parts rotated to ease solvent drip off ① ② ③ ④ ⑤
 - j) use spent solvent to pre-clean parts ① ② ③ ④ ⑤
 - k) use multistage cleaning ① ② ③ ④ ⑤
 - l) use alternate cleaning [abrasive, cryogenic, thermal, laser flash] ① ② ③ ④ ⑤
 - m) shot-blast media chosen to reduce waste volume ① ② ③ ④ ⑤
- 2.3 Parts cleaning (aqueous)
 - a) remove sludge frequently ① ② ③ ④ ⑤
 - b) dry cleaning & stripping used prior to wash ① ② ③ ④ ⑤
 - c) oil separation & filtration used to recycle fluids ① ② ③ ④ ⑤
 - d) spray, fog or chemical rinses used ① ② ③ ④ ⑤
 - e) deionized makeup water used ① ② ③ ④ ⑤
- 2.4 Abrasive cutting (abrasives, sludge)
 - a) greaseless or water based binders used on abrasives ① ② ③ ④ ⑤
 - b) automatic spray application of media to wheel ① ② ③ ④ ⑤
 - c) water level controls used ① ② ③ ④ ⑤
 - d) synthetic abrasives used ① ② ③ ④ ⑤
- 2.5 Baghouse dust and scrubber (dust with heavy metal contamination)
 - a) work with suppliers to reduce heavy metal content ① ② ③ ④ ⑤
 - b) induction furnaces used to reduce dust production ① ② ③ ④ ⑤
 - c) recycle dust to original [or other] process ① ② ③ ④ ⑤
 - d) recover contaminants [pyrometallurgical treatment, rotary kiln, hydrogen reduction, or other process] ① ② ③ ④ ⑤
 - e) recycle to cement manufacturer ① ② ③ ④ ⑤

Waste Reduction Assessment



2.6 Foundry issues [slag, spent sand]

- a) calcium carbide replaced with calcium fluoride or calcium oxide ① ② ③ ④ ⑤
- b) sulfur reduced in feedstock ① ② ③ ④ ⑤
- c) modernized process controls ① ② ③ ④ ⑤
- d) silica sand used instead of olivine [easier to detoxify] ① ② ③ ④ ⑤
- e) sand and shot blast dust are kept separate ① ② ③ ④ ⑤
- f) metals are recovered from sand ① ② ③ ④ ⑤
- g) blend old and new sand for mold making ① ② ③ ④ ⑤
- h) wash, air scrub, or thermal recovery treatment of sand ① ② ③ ④ ⑤
- i) reuse sand for construction / land fill covering ① ② ③ ④ ⑤

Waste Reduction Assessment



Paint Coating / Metal Finishing

EPA/625/R-92/011/EPA/600/R-92/088

3.1 Spray coating (overspray, solvents, clean -up)

- a) 50% overlap pattern maintained on parts ① ② ③ ④ ⑤
- b) keep gun 6 to 8 inches from surface ① ② ③ ④ ⑤
- c) limit gun traverse speed to 250 feet per minute ① ② ③ ④ ⑤
- d) assure gun is perpendicular to surface ① ② ③ ④ ⑤
- e) trigger gun at beginning & end of each pass ① ② ③ ④ ⑤
- f) operators trained properly ① ② ③ ④ ⑤
- g) robotics used [if properly adjusted] ① ② ③ ④ ⑤
- h) lowest pressure for atomization used ① ② ③ ④ ⑤
- i) overspray recycled / reused ① ② ③ ④ ⑤
- j) ~~electrostatic~~ spray system used ① ② ③ ④ ⑤
- k) ~~replace~~ air-spray with airless, air assisted, turbine bell, or HVLP ① ② ③ ④ ⑤
- l) mix paint on site to reduce material used ① ② ③ ④ ⑤

3.2 Coating Selection

- a) assure parts pass QC before painting ① ② ③ ④ ⑤
- b) use high solids formulation ① ② ③ ④ ⑤
- c) use conversion [primer] coating ① ② ③ ④ ⑤
- d) use powder coating ① ② ③ ④ ⑤
- e) use water based formulation ① ② ③ ④ ⑤
- f) Use UV cured or auto pheritic formulation ① ② ③ ④ ⑤

3.3 Process Options

- a) use light to dark batch sequencing ① ② ③ ④ ⑤
- b) increase batch size ① ② ③ ④ ⑤
- c) standardize solvents used ① ② ③ ④ ⑤
- d) reuse cleaning solvents ① ② ③ ④ ⑤
- e) clean equipment immediately after use ① ② ③ ④ ⑤
- f) consider eliminating coatings, use alternate materials ① ② ③ ④ ⑤
- g) institute rigid inventory control procedures [stock rotation] ① ② ③ ④ ⑤
- h) locate solvent tanks away from ovens ① ② ③ ④ ⑤

3.4 Plating Source reduction

- a. using nonchelated process chemistries ① ② ③ ④ ⑤
 - 1. inspect parts before coating ① ② ③ ④ ⑤
 - 2. using multiple stage counter-current rinse systems ① ② ③ ④ ⑤
 - 3. using conductivity controls and flow timers ① ② ③ ④ ⑤
 - 4. filter solution bath circulation system ① ② ③ ④ ⑤
 - 5. remove anodes when not in use ① ② ③ ④ ⑤
 - 8. use static[no-flow] rinse tank ① ② ③ ④ ⑤

Waste Reduction Assessment



- d. extend the life of process baths through:
 - 1. initiating electrolytic recovery or chemical treatment and filtration ① ② ③ ④ ⑤
 - 2. reducing drag-in ① ② ③ ④ ⑤
 - 3. good housekeeping ① ② ③ ④ ⑤
 - 4. using distilled, deionized, or reverse osmosis water ① ② ③ ④ ⑤
 - 5. properly maintaining racks ① ② ③ ④ ⑤
 - 6. using purer anodes and bags ① ② ③ ④ ⑤
 - e. reduce drag-out loss by:
 - 1. operating process baths at the lowest chemical concentrations ① ② ③ ④ ⑤
 - 2. operating process baths at higher temperatures ① ② ③ ④ ⑤
 - 3. withdrawing workpiece racks at a slower rate ① ② ③ ④ ⑤
 - 4. draining workpiece racks for longer periods ① ② ③ ④ ⑤
 - 5. capturing drag-out on a board that drains back into the process tank ① ② ③ ④ ⑤
 - 6. adding wetting agents to process baths ① ② ③ ④ ⑤
 - 7. improving workpiece positioning ① ② ③ ④ ⑤
 - 8. recovering process chemicals in a drag-out tank and replenishing the process bath with the recovered solution ① ② ③ ④ ⑤
 - 9. spraying directly over the process tank ① ② ③ ④ ⑤
- 3.5 Recycling and resource recovery
- a) reusing rinse water effluent [counter flow tanks] ① ② ③ ④ ⑤
 - b) implementing material [from sludge] reuse techniques ① ② ③ ④ ⑤
 - c) regenerating spent process bath solutions ① ② ③ ④ ⑤
 - d) recycling process bath chemicals and rinse water solutions through use of chemical recover technologies, including evaporation, reverse osmosis, ion exchange, electrolysis, electrowinning, electro dialysis ① ② ③ ④ ⑤
 - e) recycling spent solvents by distillation ① ② ③ ④ ⑤
 - f) separating various waste streams for recycling, selective treatment, and batch treatment. ① ② ③ ④ ⑤
 - g) implementing alternative treatment systems such as ion exchange, reverse osmosis, evaporation, and electrolysis ① ② ③ ④ ⑤

Waste Reduction Assessment



Commercial Printing

EPA/625/7-90/008

4.1 Material handling and storage

- a) material pre-inspection ① ② ③ ④ ⑤
- b) proper storage of materials ① ② ③ ④ ⑤
- c) restrict traffic through area ① ② ③ ④ ⑤
- d) inventory control ① ② ③ ④ ⑤
- e) purchase quantities according to needs ① ② ③ ④ ⑤
- f) recycle empty containers ① ② ③ ④ ⑤
- g) recycle photographic film and paper ① ② ③ ④ ⑤
- h) keep lids on containers ① ② ③ ④ ⑤
- i) use plunger bottles to wet solvent rags ① ② ③ ④ ⑤

4.2 Image processing

- a) electronic imaging and laser plate making ① ② ③ ④ ⑤
- b) material substitution ① ② ③ ④ ⑤
- c) extend bath life [ammonium thiosulfate, stop prior to fixing, acetic acid] ① ② ③ ④ ⑤
- d) use squeegees ① ② ③ ④ ⑤
- e) employ counter-current washing ① ② ③ ④ ⑤
- f) recover silver and recycle chemicals ① ② ③ ④ ⑤
- g) use non-silver films [vesicular, diazo, electrostatic, photopolymer] ① ② ③ ④ ⑤

4.3 Plate processing

- a) reduce solution loss ① ② ③ ④ ⑤
- b) replace metal etching/plating operations ① ② ③ ④ ⑤
- c) use non-hazardous developers and finishers ① ② ③ ④ ⑤

4.4 Make-ready

- a) implement accurate counting methods ① ② ③ ④ ⑤
- b) automated plate benders, scanners ① ② ③ ④ ⑤
- c) automatic ink key setting system ① ② ③ ④ ⑤
- d) computerized registration ① ② ③ ④ ⑤
- e) ink/water ratio sensor ① ② ③ ④ ⑤

Waste Reduction Assessment



4.5 Printing

- | | |
|---|-----------|
| a) install web break detectors | ① ② ③ ④ ⑤ |
| b) automatic web splicers | ① ② ③ ④ ⑤ |
| c) use automatic ink levelers | ① ② ③ ④ ⑤ |
| d) store ink properly | ① ② ③ ④ ⑤ |
| e) use less hazardous inks [soy, water, UV cure] | ① ② ③ ④ ⑤ |
| f) standard ink sequence to avoid fountain cleaning | ① ② ③ ④ ⑤ |
| g) recycle waste ink [squeegee & reuse] | ① ② ③ ④ ⑤ |
| h) use alternative fountain solutions | ① ② ③ ④ ⑤ |
| i) use alternative cleaning solvents [e.g. hexane, water, CO ₂ blasting] | ① ② ③ ④ ⑤ |
| j) automatic blanket cleaners | ① ② ③ ④ ⑤ |
| k) reduce the need to clean [non-drying aerosols] | ① ② ③ ④ ⑤ |
| l) improve cleaning efficiency | ① ② ③ ④ ⑤ |
| m) collect and reuse solvent [by color] | ① ② ③ ④ ⑤ |
| n) recycle lubricating oils | ① ② ③ ④ ⑤ |
| o) alternative printing techniques | ① ② ③ ④ ⑤ |
| p) reduce paper use and recycle waste paper | ① ② ③ ④ ⑤ |
| q) launder rags after centrifuge | ① ② ③ ④ ⑤ |
| r) dedicate one press to toxics | ① ② ③ ④ ⑤ |
| s) install hoods to capture VOC's | ① ② ③ ④ ⑤ |
| t) use heavy duty screens for longer life | ① ② ③ ④ ⑤ |

Waste Reduction Assessment



Fiberglass-reinforced and Composite Plastics

EPA/625/7-91/014

5.1 Equipment cleaning:

- a) Restrict solvent amount issued to work area ① ② ③ ④ ⑤
- b) Store & reuse solvents for cleaning ① ② ③ ④ ⑤
- c) Use less toxic/ less volatile solvents [dibasic ester] ① ② ③ ④ ⑤
- d) Reduce solvent rinse usage [squeegee] ① ② ③ ④ ⑤
- e) Segregate materials as generated? ① ② ③ ④ ⑤

5.2 Scrap solvated and partially cured resins:

- a) Resin pan fits fabric + 10 inches maximum ① ② ③ ④ ⑤
- b) Reduced size of transfer piping ① ② ③ ④ ⑤
- c) Participate in Waste exchange program ① ② ③ ④ ⑤

5.3 Gel coat Resin and solvent overspray

- a) Orient spray horizontally ① ② ③ ④ ⑤
- b) Use air-assisted airless guns [or HVLP] ① ② ③ ④ ⑤
- c) Use pre-impregnated reinforcements where appropriate ① ② ③ ④ ⑤
- d) Choose resin roller dispensers [vrs. spray] ① ② ③ ④ ⑤
- e) Vacuum bag and closed molds are used ① ② ③ ④ ⑤
- f) use Just-in-Time scheduling for mixing ① ② ③ ④ ⑤

5.5 Contaminated floor sweepings / clean-up materials:

- a) Use recyclable floor sweep compound [not sawdust] ① ② ③ ④ ⑤
- b) Use paper or sand floor covering ① ② ③ ④ ⑤
- c) Formulate to lower monomer content [36% styrene max.] ① ② ③ ④ ⑤
- d) Mechanized blow-out of feed lines ① ② ③ ④ ⑤
- e) Replace solvents with emulsifiers ① ② ③ ④ ⑤
- f) Use on-site solvent recovery ① ② ③ ④ ⑤
- g) Send solvents off-site for recovery & return ① ② ③ ④ ⑤

Waste Reduction Assessment



Pharmaceutical Industry

This industry typically involves SIC codes: 2833 (medicinal chemicals and botanical products, 2834 (pharmaceutical preparations, 2835 (in vitro and in vivo diagnostic substances), and 2836 (biological products, except diagnostic substances)

6.1 Which of the following processes are involved in this operation?

- Research and development
- Chemical synthesis
- Natural Product extraction
- Formulation

6.2 General Material Handling

- a. raw materials specifications distributed to suppliers ① ② ③ ④ ⑤
- b. raw materials QC specifications for acceptance defined ① ② ③ ④ ⑤
- c. computerized computer inventory system ① ② ③ ④ ⑤

6.3 Bulk Liquids Handling (prevention of spills and ground contamination during transfer operation)

- a. Use of flow totalizers with cutoff ① ② ③ ④ ⑤
- b. Air emissions from tank controlled by conservation vents ① ② ③ ④ ⑤
- c. Air emissions from tank controlled by nitrogen blanketing ① ② ③ ④ ⑤
- d. Air emissions from tank controlled by absorber/condenser ① ② ③ ④ ⑤
- e. Air emissions from tank controlled by vapor loss system ① ② ③ ④ ⑤
- f. storage tanks monitored for leaks ① ② ③ ④ ⑤
- g. pipes cleaned regularly ① ② ③ ④ ⑤
- h. cleaning methods allow direct reuse or recycling ① ② ③ ④ ⑤

6.5 Product Information

- a. use reusable containers ① ② ③ ④ ⑤
- b. use disposable items during manufacturing ① ② ③ ④ ⑤
- c. using largest containers ① ② ③ ④ ⑤
- d. solvent substitution program ① ② ③ ④ ⑤
- e. product reformulation program ① ② ③ ④ ⑤
- f. raw material substitutions planned ① ② ③ ④ ⑤

6.5 Drums, Containers, and Packages

- a. use pre-weighed containers ① ② ③ ④ ⑤
- b. use soluble bags ① ② ③ ④ ⑤
- c. bulk delivery of materials ① ② ③ ④ ⑤

Waste Reduction Assessment



6.6 Cleaning

- a. alkaline surfactants used in aqueous cleaning ① ② ③ ④ ⑤
- b. alkaline cleaners used in cleaning ① ② ③ ④ ⑤
- c. acids used in aqueous cleaning ① ② ③ ④ ⑤
- d. acid sanitizer used in cleaning ① ② ③ ④ ⑤
- e. spent cleaning solvents biodegradable ① ② ③ ④ ⑤
- f. spent cleaning solvents treated on site ① ② ③ ④ ⑤
- g. spent cleaning solvents transported off site ① ② ③ ④ ⑤
- h. spent disinfectants biodegradable ① ② ③ ④ ⑤
- i. spent disinfectants treated on site ① ② ③ ④ ⑤
- j. spent disinfectants transported off site ① ② ③ ④ ⑤
- k. ethylene oxide used for sterilization ① ② ③ ④ ⑤
- l. gamma irradiation used for sterilization ① ② ③ ④ ⑤
- m. vapor recovery used ① ② ③ ④ ⑤
- n. tank wipers used ① ② ③ ④ ⑤
- o. Pressure washers used ① ② ③ ④ ⑤
- p. Parts washers used ① ② ③ ④ ⑤

6.7 Fermentation

- a. sump(s) cleaned out regularly ① ② ③ ④ ⑤
- b. fermenter inspected for heat transfer fluid leaks ① ② ③ ④ ⑤
- c. fermenter inspected for agitator seal fluid leaks ① ② ③ ④ ⑤
- d. fermenter inspected for integrity of process connections ① ② ③ ④ ⑤
- e. fermenter inspected for integrity of sterile barriers ① ② ③ ④ ⑤
- f. used media sterilized ① ② ③ ④ ⑤
- g. media, cell debris, or vent gas waste streams non-hazardous ① ② ③ ④ ⑤

6.8 Chemical synthesis, Natural Product Extraction, Formulation use of water

- a. water is used for injection ① ② ③ ④ ⑤
- b. hoses have spray nozzles ① ② ③ ④ ⑤
- c. distilled water is used ① ② ③ ④ ⑤
- d. softened water is used ① ② ③ ④ ⑤
- e. municipal water is used ① ② ③ ④ ⑤
- f. reverse osmosis or deionized water is used ① ② ③ ④ ⑤
- g. water minimization program in place ① ② ③ ④ ⑤

6.9 Operating Practices

- a. batch formulation tested before scale up to production ① ② ③ ④ ⑤
- b. laboratory checks made regularly on processes ① ② ③ ④ ⑤
- c. plant material balances performed ① ② ③ ④ ⑤
- d. operators are given instructions ① ② ③ ④ ⑤
- e. incentives in place related to waste minimization ① ② ③ ④ ⑤
- f. scheduling done to minimize equipment cleaning ① ② ③ ④ ⑤
- g. scheduling done by sequential formulations ① ② ③ ④ ⑤
- h. waste minimization goals are in place & known ① ② ③ ④ ⑤

Waste Reduction Assessment



PRINTED CIRCUIT BOARD MANUFACTURING

EPA/625/7-90/007

MATERIAL HANDLING

7.1 GENERAL HANDLING TECHNIQUES

- a. Raw materials tested for quality before acceptance ① ② ③ ④ ⑤
- b. Obsolete raw material returned to the supplier ① ② ③ ④ ⑤
- c. Inventory used in first-in first-out order ① ② ③ ④ ⑤
- d. Inventory system computerized ① ② ③ ④ ⑤
- e. Inventory control system designed to prevent waste generation ① ② ③ ④ ⑤
- f. Formal personnel training program on raw material handling - spill prevention. ① ② ③ ④ ⑤
- g. Program includes information on the safe handling of the types of drums, containers and packages received ① ② ③ ④ ⑤
- h. Spill containment in material storage area ① ② ③ ④ ⑤

7.2 BULK LIQUIDS HANDLING

- a. Safeguards to prevent spills and ground contamination during tank filling:
 - High level shutdown/alarms ① ② ③ ④ ⑤ Secondary containment ① ② ③ ④ ⑤
 - Flow totalizers with cutoff ① ② ③ ④ ⑤ Other _____ ① ② ③ ④ ⑤
- b. Solvent storage tanks air emissions controlled by:
 - Conservation vents ① ② ③ ④ ⑤
 - Nitrogen blanketing ① ② ③ ④ ⑤
 - Adsorber/Absorber/Condenser ① ② ③ ④ ⑤
 - Other vapor loss control system ① ② ③ ④ ⑤
- c. Storage tanks routinely monitored for leaks ① ② ③ ④ ⑤
- d. Safeguards to prevent spills of liquids being dispensed ① ② ③ ④ ⑤
- e. Are dry methods used to cleanup spills ① ② ③ ④ ⑤
- f. Do cleaning methods allow for direct waste reuse or recycling ① ② ③ ④ ⑤

7.3 DRUMS, CONTAINERS, AND PACKAGES

- a. Employees trained to safely handle the types of drums & packages received ① ② ③ ④ ⑤
- b. Employees trained to handle spilled raw materials ① ② ③ ④ ⑤
- c. Minimize traffic through the raw material storage area ① ② ③ ④ ⑤
- d. Hazardous materials purchased in preweighed containers to avoid the need for weighing ① ② ③ ④ ⑤

MATERIAL AND PROCESS SUBSTITUTION

7.4 CLEANING AND SURFACE PREPARATION

- a. Abrasives instead of solvents, acids, or alkalis ① ② ③ ④ ⑤
- b. Non-chelated cleaning compounds ① ② ③ ④ ⑤

7.5 PATTERN PRINTING AND MASKING

- a. Aqueous processable resist instead of solvent based resist ① ② ③ ④ ⑤
- b. Screen printing instead of photolithography to eliminate need for developers ① ② ③ ④ ⑤
- c. Dry photoresist removal methods to avoid use of organic strippers ① ② ③ ④ ⑤

Waste Reduction Assessment



PRINTED CIRCUIT BOARD MANUFACTURING [cont.]

7.6 ELECTROPLATING AND ELECTROLESS PLATING

- a. Mechanical instead of chemical board production methods ① ② ③ ④ ⑤
- b. Non-cyanide process baths ① ② ③ ④ ⑤
- c. Non-cyanide stress relievers ① ② ③ ④ ⑤

7.7 ETCHING

- a. Differential plating instead of conventional electroless plating ① ② ③ ④ ⑤
- b. Pattern instead of panel plating ① ② ③ ④ ⑤
- c. Additive instead of subtractive methods ① ② ③ ④ ⑤
- d. Non-Chelated etchants ① ② ③ ④ ⑤
- e. Non-chromated etchants ① ② ③ ④ ⑤

7.8 WASTEWATER TREATMENT

- a. Alternative chemicals for volume reduction ① ② ③ ④ ⑤
- b. Alternative treatment methods(ion exchange) ① ② ③ ④ ⑤

PROCESS MODIFICATION

7.9 EXTENDING PROCESS BATH LIFE

- a. Drag-In Reduction
 - 1. Racks cleaned regularly to prevent corrosion ① ② ③ ④ ⑤
 - 2. Coated racks used to avoid contamination ① ② ③ ④ ⑤
 - 3. Investigated the use of purer anodes to avoid contamination from metallic impurities in the anodes ① ② ③ ④ ⑤
 - 4. Anode bags used to prevent corroded anodes from falling into the bath ① ② ③ ④ ⑤
 - 5. Anodes removed when bath is not in use ① ② ③ ④ ⑤
 - 6. Rinsing adequate to prevent or minimize drag-in ① ② ③ ④ ⑤
 - 7. Deionized water used for process bath make-up: ① ② ③ ④ ⑤
 - 8. Chemicals properly stored and mixed just before use to avoid decomposition and shortened bath life ① ② ③ ④ ⑤
- b. Drag-Out Reduction
 - 1. Process baths operated at the lower end of the manufacturer's suggested range of operating concentrations ① ② ③ ④ ⑤
 - 2. Fresh process bath solutions operated at a lower concentration than replenished process bath solutions ① ② ③ ④ ⑤
 - 3. Operate chemical process baths at highest temperature that doesn't affect production quality ① ② ③ ④ ⑤
 - 4. Use wetting agents ① ② ③ ④ ⑤
 - 5. Boards properly racked ① ② ③ ④ ⑤
 - 6. Boards withdrawn slowly, and ample drainage time allowed ① ② ③ ④ ⑤
 - 7. Optimal work piece rack removal rate and drainage time for work piece racks been determined ① ② ③ ④ ⑤
 - 8. Training personnel to follow proper workpiece rack removal rates & drainage times ① ② ③ ④ ⑤
 - 9. Automatic board handler considered ① ② ③ ④ ⑤
 - 10. Space between process bath tanks and rinse tanks ① ② ③ ④ ⑤
 - 11. Process baths that operate at elevated temperatures use drag-out tanks as the initial rinse ① ② ③ ④ ⑤
 - 12. Drag-out tank solution added back to the process tank ① ② ③ ④ ⑤

Waste Reduction Assessment



PRINTED CIRCUIT BOARD MANUFACTURING [cont.]

- c. Avoiding Bath Decomposition and Impurity Removal
 - 1. Bath activity regularly monitored ① ② ③ ④ ⑤
 - 2. Bath temperature properly controlled ① ② ③ ④ ⑤
 - 3. Heating coils cleaned regularly ① ② ③ ④ ⑤
 - 4. Use heated jacketed tanks instead of coils ① ② ③ ④ ⑤
 - 5. Process baths agitated ① ② ③ ④ ⑤
 - 6. Mechanical agitation be used to avoid the formation of carbonates due to air agitation ① ② ③ ④ ⑤
 - 7. Process baths continuously filtered ① ② ③ ④ ⑤
 - 8. Baths batch filtered ① ② ③ ④ ⑤
 - 9. Use increase filtering to reduce sludge ① ② ③ ④ ⑤
 - 11. Coarser filters (Coarser filters hold more sludge & need replacement less often.) ① ② ③ ④ ⑤
 - 11. Use carbon filtering to reduce organic buildup ① ② ③ ④ ⑤
 - 12. Regenerate/purify solutions by cooling or freezing ① ② ③ ④ ⑤
 - 13. Use recovered solids in another process ① ② ③ ④ ⑤
 - 14. Alkaline stripper used to clean photoresist material off of printed circuit boards ① ② ③ ④ ⑤
 - 15. Stripper decanted or filtered periodically to remove polymer flakes and increase the useful life ① ② ③ ④ ⑤
- 7.10 **IMPROVING RINSE EFFICIENCY**
 - a. Drag-out tank used to recover drag-out and reduce loading on the rinse system ① ② ③ ④ ⑤
 - b. Treat recovered drag out separately from the spent rinse water ① ② ③ ④ ⑤
 - c. Use spray or fog rinsing to reduce rinse water use ① ② ③ ④ ⑤
 - d. Rinse systems utilize forced air or forced water as a means of agitating the rinse solution ① ② ③ ④ ⑤
 - e. Work piece racks agitated manually while submerged in the rinse solution ① ② ③ ④ ⑤
 - f. Use multiple counter-current rinse tanks at any of the rinsing stations ① ② ③ ④ ⑤
 - g. Elevate rinse system flow rates based on rinsing needs of the particular process chemistry ① ② ③ ④ ⑤
 - h. The sum of each rinse system's estimated daily water usage approximate the average daily volume of wastewater treated ① ② ③ ④ ⑤
 - I. Utilize the flow restrictors, flow control meters, or other devices to regulate the flow of water through all the rinse tanks ① ② ③ ④ ⑤
 - j. Use rinse water effluents from operations that follow acid processes in rinse systems following alkaline processes. ① ② ③ ④ ⑤
 - l. Use deionized water for rinsing ① ② ③ ④ ⑤

Waste Reduction Assessment



PRINTED CIRCUIT BOARD MANUFACTURING [cont.]

GOOD OPERATING PRACTICES

7.11 GENERAL

- a. Optimize production schedule to decrease waste generation ① ② ③ ④ ⑤
- b. Perform plant material balances routinely for each material ① ② ③ ④ ⑤
- c. Keep individual wastes records with sources of origin and disposal ① ② ③ ④ ⑤
- d. Provided operators with detailed operating manuals or instructions ① ② ③ ④ ⑤
- e. Operator job functions well defined ① ② ③ ④ ⑤
- f. Regularly scheduled training programs provided to operators ① ② ③ ④ ⑤
- g. Employee incentive programs related to waste minimization ① ② ③ ④ ⑤
- h. Waste minimization assessment been performed at the facility in the past ① ② ③ ④ ⑤
- i. Established waste minimization program in place ① ② ③ ④ ⑤

SEGREGATION, REUSE, RECOVERY & TREATMENT

7.12 SEGREGATION

- a. Solvent Wastes segregated ① ② ③ ④ ⑤
- b. Aqueous wastes segregated from Solvent wastes ① ② ③ ④ ⑤
- c. Spent solutions segregated from the rinse water streams ① ② ③ ④ ⑤
- d. Chelators used in process baths ① ② ③ ④ ⑤
- e. Chelator waste streams segregated from other waste streams prior to treatment ① ② ③ ④ ⑤

7.13 CONSOLIDATION/REUSE

- a. Standardized solvent used for cleaning ① ② ③ ④ ⑤
- b. Spent alkaline and/or acidic baths used for elementary neutralization in the industrial waste treatment process ① ② ③ ④ ⑤

7.14 ON-SITE RECOVERY

- a. Consider on-site distillation of the spent solvent ① ② ③ ④ ⑤
- b. Process chemicals or metals recovered from waste streams. ① ② ③ ④ ⑤
- c. Recycle rinse water in a closed loop rinse water system ① ② ③ ④ ⑤

7.15 ALTERNATIVE TREATMENT TECHNOLOGY

(If the facility operates an industrial waste treatment facility)

- a. If yes, does the treatment facility produce a wastewater treatment sludge that is handled as a hazardous waste ① ② ③ ④ ⑤
- b. Evaluate the use of alternative treatment chemicals to identify those that generate the lowest volume of sludge ① ② ③ ④ ⑤
- c. Evaluate the use of an alternative treatment system that produces less residual waste than the existing treatment facility ① ② ③ ④ ⑤

Waste Reduction Assessment



Chromated Copper Arsenate (CCA) Wood-Treatment Plants

study of two facilities

8.1 General

- a. Enclosed treatment, chemical and wood storage areas ① ② ③ ④ ⑤
- b. Concrete floor in tank farm and drip areas has impermeable coating ① ② ③ ④ ⑤
- c. Operator training programs conducted ① ② ③ ④ ⑤
- d. Handling training programs conducted ① ② ③ ④ ⑤
- e. Spill containment/cleaning training programs conducted ① ② ③ ④ ⑤
- f. Spill containment volume equals total liquid storage volume ① ② ③ ④ ⑤
- g. Tanks elevated ① ② ③ ④ ⑤
- h. Keep individual wastes records with sources of origin and disposal ① ② ③ ④ ⑤
- i. Employee incentive programs related to waste minimization ① ② ③ ④ ⑤
- j. Established waste minimization program in place ① ② ③ ④ ⑤

8.2 General Handling Techniques

- a. Safeguards to prevent spills during tank filling ① ② ③ ④ ⑤
- b. Leak detection system employed ① ② ③ ④ ⑤
- c. Lumber from suppliers is tarped during shipping ① ② ③ ④ ⑤
- d. Lumber receiving inspection conducted ① ② ③ ④ ⑤
- e. Off-grade/damaged lumber returned to sawmill ① ② ③ ④ ⑤
- f. Lumber handled and stored carefully to prevent damage ① ② ③ ④ ⑤
- g. Wood crosspieces used to separate wood units ① ② ③ ④ ⑤
- h. Lumber stacks in open yard covered ① ② ③ ④ ⑤
- i. Automatic lumber handling system utilized ① ② ③ ④ ⑤
- j. Spill containment in tank areas ① ② ③ ④ ⑤
- k. Minimize traffic through lumber storage areas ① ② ③ ④ ⑤

8.3 Process and Waste Control

- a. Drip pads/pans under chemical drip areas ① ② ③ ④ ⑤
- b. Spill containment in process areas ① ② ③ ④ ⑤
- c. Treated lumber remains over drip pan until dripping ceases ① ② ③ ④ ⑤
- d. Tank farm uses automatic and remote monitoring and equipment for control ① ② ③ ④ ⑤
- e. Treat cylinder air emissions returned to working tank ① ② ③ ④ ⑤
- f. CCA oxides used to enhance chemical fixation ① ② ③ ④ ⑤
- g. Computer controlled and monitored mixing and treatment processes ① ② ③ ④ ⑤
- h. Rapid cycle treatment process utilizing high pressure employed ① ② ③ ④ ⑤
- i. Slow pressure release follows high pressure treatment ① ② ③ ④ ⑤
- j. Final vacuum achieved quickly and held for a long period ① ② ③ ④ ⑤
- k. Cylinder strip pumps continuously return chemicals back to working tank ① ② ③ ④ ⑤
- l. Mouth of treating cylinders slightly elevated ① ② ③ ④ ⑤
- m. Treated products analyzed for chemical retention ① ② ③ ④ ⑤
- n. Lumber bought only from sawmills with neat and clean lumber ① ② ③ ④ ⑤
- o. Lumber power washed, wood chips/debris removed as required ① ② ③ ④ ⑤
- p. Tanks, cylinders, pans, material handling and containment systems inspected regularly ① ② ③ ④ ⑤

8.4 Recycling and Reuse

- a. Chemical drips and wash water from drips pans filtered and recycled ① ② ③ ④ ⑤
- b. Waste materials (bands, totes, wood pieces, containers) reused/recycled ① ② ③ ④ ⑤

Waste Reduction Assessment



Plastic Molding (Injection, Blow)

EPA/625/7-91/014

9.1 Resin:

- a) Bulk receiving of plastic in poly-bags (refillable) ① ② ③ ④ ⑤
- b) Schedule to minimize purge between batches ① ② ③ ④ ⑤
- c) return / recycle start-up & purge materials ① ② ③ ④ ⑤

9.2 Mold Cleaning Solvent:

- a) Store and reuse solvents for cleaning ① ② ③ ④ ⑤
- b) Use less toxic/less volatile solvents ① ② ③ ④ ⑤
- c) Reduce solvent rinse usage [minimize volume] ① ② ③ ④ ⑤
- d) Clean molds and lines on an as needed basis? ① ② ③ ④ ⑤

9.3 Molding Machine Hydraulic Oil:

- a) Repair leaks from hydraulic system on molding machines ① ② ③ ④ ⑤
- b) Filter or centrifuge hydraulic oil to allow reuse (test to determine if reclaimed oil has required properties) ① ② ③ ④ ⑤
- c) Eliminate hydraulic oil usage by converting to variable speed electric drives ① ② ③ ④ ⑤

9.4 Metal Working Fluid for Mold Machining:

- a) Prolong useful life by cleaning and adding biocide ① ② ③ ④ ⑤

Waste Reduction Assessment



Chemical Manufacturing

EPA/625/7-91/014

10.1 Material input, storage, and handling

- a) First-in, first out inventory control to prevent expiration ① ② ③ ④ ⑤
- b) Have designated material storage area ① ② ③ ④ ⑤
- c) Return obsolete material to suppliers ① ② ③ ④ ⑤
- d) Segregate waste streams, especially hazardous from non-hazardous, as a prerequisite for recovery and reuse ① ② ③ ④ ⑤
- e) Store containers properly and protect from weather to prevent damage, contamination, and degradation ① ② ③ ④ ⑤
- f) Prevent and contain spills and leaks via proper equipment maintenance and increased employee training and supervision ① ② ③ ④ ⑤
- g) Minimize traffic through material storage area ① ② ③ ④ ⑤
- h) Improve quality of feedstocks by working with suppliers ① ② ③ ④ ⑤
- i) Re-examine need for each raw material by considering process modification and improved process control ① ② ③ ④ ⑤
- j) Use off-spec material if the quality is not crucial to the process ① ② ③ ④ ⑤
- k) Improve finished product quality to reduce waste production at customer's plants ① ② ③ ④ ⑤
- l) Use inhibitors to prevent unwanted side reactions or polymer formation ① ② ③ ④ ⑤
- m) Reformulate products from powder to pellets to prevent dust emissions ① ② ③ ④ ⑤
- n) Reuse inert ingredients when flushing solids handling equipment ① ② ③ ④ ⑤
- o) Change to reusable containers, totes or bulk shipments to avoid container disposal ① ② ③ ④ ⑤
- p) Recover product from tankcars and tanktrucks ① ② ③ ④ ⑤
- q) use refrigeration [temp. control] to extend shelf life ① ② ③ ④ ⑤

10.2 Production process modifications:

- A. Reactors (improvements to increase mixing quality is the key to waste reduction)
 - a) Install baffles, high speed motors, improved mixing blades, multiple impellers, pump recirculation or in-line static mixing to improve reactor mixing ① ② ③ ④ ⑤
 - b) Distribute feedstocks better in fixed-bed reactors to improve yield and conversion ① ② ③ ④ ⑤
 - c) Improve reactant introduction to avoid secondary reactions during premixing ① ② ③ ④ ⑤
 - d) Improve catalyst and continuously upgrade ① ② ③ ④ ⑤
 - e) Provide separate reactor for recycle streams ① ② ③ ④ ⑤
 - f) Avoid hot spots that give unwanted by-products by improving reactor heating and cooling ① ② ③ ④ ⑤
 - g) Consider different reactor design (plug flow vs. Classical fixed bed) ① ② ③ ④ ⑤
 - h) Improve control to maintain optimal conditions in reactor ① ② ③ ④ ⑤

Waste Reduction Assessment



- B. Heat Exchangers (tube wall temperature key for temperature sensitive products)**
 - a) Use lower pressure steam to reduce tube wall temperature ① ② ③ ④ ⑤
 - b) De-superheat steam ① ② ③ ④ ⑤
 - c) Combine high and low pressure stream in thermo-compressor ① ② ③ ④ ⑤
 - d) Use staged heating (waste heat, low pressure steam, followed by high pressure steam) ① ② ③ ④ ⑤
 - e) Use on-line heat exchanger cleaning ① ② ③ ④ ⑤
 - f) Use scraped-wall heat exchanger to recover saleable products ① ② ③ ④ ⑤
 - g) Monitor heat exchanger fouling ① ② ③ ④ ⑤
 - h) Use non-corroding tubes in heat exchangers ① ② ③ ④ ⑤
- C. Pumps (preventing leaks is the key)**
 - a) Recover seal flushes and purges ① ② ③ ④ ⑤
 - b) Use seal-less pumps ① ② ③ ④ ⑤
- D. Furnaces (avoid hot tube wall temperature is the key)**
 - a) Replace coil (consider alternate designs at replacement) ① ② ③ ④ ⑤
 - b) Use high temperature intermediate fluid to eliminate direct heat ① ② ③ ④ ⑤
 - c) Is sufficient steam superheat available to eliminate the need for a furnace? ① ② ③ ④ ⑤
- E. Distillation columns**
 - a) Increase reflux ratio if column capacity is adequate for better separation ① ② ③ ④ ⑤
 - b) Add section to column for better separation ① ② ③ ④ ⑤
 - c) Re-tray or repack column for better separation ① ② ③ ④ ⑤
 - d) Change feed tray for improved separation ① ② ③ ④ ⑤
 - e) Insulate column to prevent heat loss ① ② ③ ④ ⑤
 - f) Improve feed distribution ① ② ③ ④ ⑤
 - g) Preheat column feed to improve efficiency ① ② ③ ④ ⑤
 - h) Remove overhead products from tray near top of column to obtain higher purity product ① ② ③ ④ ⑤
 - i) Increase size of vapor line to decrease re-boiler temperature ① ② ③ ④ ⑤
 - j) Consider alternate re-boiler design (falling film, pumped recirculation, high-flux tubes) instead of conventional thermosiphon ① ② ③ ④ ⑤
 - k) Reduce re-boiler temperature by using low pressure steam, de-superheated steam, a thermo-compressor or intermediate heat transfer fluids ① ② ③ ④ ⑤
 - l) Lower column pressure ① ② ③ ④ ⑤
 - m) Improve overhead condensers to capture losses through re-tubing, condenser replacement or supplemental vent condenser ① ② ③ ④ ⑤
 - n) Improve column control ① ② ③ ④ ⑤
 - o) Use a partial condenser and introduce the vapor stream to the downstream column ① ② ③ ④ ⑤

Waste Reduction Assessment



F. Piping

- a) Segregate flows to allow recovery of individual wastestreams ① ② ③ ④ ⑤
- b) Avoid overheating lines to protect temperature sensitive material ① ② ③ ④ ⑤
- c) Avoid sending hot materials to storage to prevent degradation ① ② ③ ④ ⑤
- d) Eliminate leaks ① ② ③ ④ ⑤
- e) Change pipe material or use lining if it creates color problem or produces by-products through catalytic action ① ② ③ ④ ⑤
- f) Recover vented products from storage tanks, tankcars, or tanktrucks ① ② ③ ④ ⑤

G. Process Control

- a) Improve on-line control ① ② ③ ④ ⑤
- a) Use computer control to optimize daily operation and prevent waste ① ② ③ ④ ⑤
- b) Automate startups, shutdowns and produce changeover ① ② ③ ④ ⑤
- c) Program plant to handle unexpected trips and upsets ① ② ③ ④ ⑤
- d) Reduce number and frequency of sampling ① ② ③ ④ ⑤

H. Equipment Cleaning and Changeover

- a) Avoid unnecessary equipment (eliminate cleaning between batches) ① ② ③ ④ ⑤
- b) Dedicate tanks to one product to reduce cleanout and changeover ① ② ③ ④ ⑤
- c) Scrapping down tanks, pigging or blowing lines can recover more product and reduce waste ① ② ③ ④ ⑤
- d) Use high pressure sprays, compressed air, steam and heated cleaning baths to reduce the amount of cleaner ① ② ③ ④ ⑤
- e) If feasible, reclaim and reuse cleaners ① ② ③ ④ ⑤
- f) Consider mechanical cleaning (media blasting and ultrasonic) and biodegradable chemical cleaners to reduce waste volume and toxicity ① ② ③ ④ ⑤
- g) Standardize cleaning products used in plant ① ② ③ ④ ⑤
- h) Reuse [cascade] rinse water ① ② ③ ④ ⑤

Waste Reduction Assessment



Chemical Formulators

EPA/625/7-91/014

10.5 Material handling and storage:

- a) Use first-in, first-out inventory control ① ② ③ ④ ⑤
- b) Reduce number of containers used ① ② ③ ④ ⑤
- c) Buy appropriate amounts of ingredients ① ② ③ ④ ⑤
- d) Manage laboratory samples ① ② ③ ④ ⑤
- e) Cover outdoor storage ① ② ③ ④ ⑤
- f) Install spill containment

10.6 Rinsing:

- a) Use jet sprays with pressure booster pump to reduce rinse water ① ② ③ ④ ⑤
- b) Reduce rinse water with water knife spray ① ② ③ ④ ⑤
- c) ~~Reduce~~ rinse water with steam cleaning ① ② ③ ④ ⑤
- d) ~~Reuse~~ [cascade] rinse water ① ② ③ ④ ⑤

10.7 Material recycling, reuse, and recovery

- a) Install drip pan on filling line to recovery product ① ② ③ ④ ⑤
- b) Reuse mix tank rinse water in next process batch ① ② ③ ④ ⑤
- c) Reuse floor and equipment washwater ① ② ③ ④ ⑤
- d) Treat and reuse container rinse ① ② ③ ④ ⑤
- e) Use separation technology to recover raw materials from wastestreams ① ② ③ ④ ⑤

10.8 Process Modification

- a) Convert from batch to continuous processes ① ② ③ ④ ⑤
- b) For raw material transfer, used closed piping and pumps ① ② ③ ④ ⑤
- c) Use dedicated tanks to reduce the need for rinsing ① ② ③ ④ ⑤
- d) Use computer production scheduling to minimize changeover and consolidate batches ① ② ③ ④ ⑤

10.9 Process operation and maintenance

- a) Use high quality raw materials to avoid product contamination ① ② ③ ④ ⑤
- b) For floor washing, mops and squeegees reduce the amount of washwater required ① ② ③ ④ ⑤
- c) Use wiper blades on mixing tanks to physically wipe down tank sides and reduce rinse water requirements ① ② ③ ④ ⑤

Waste Reduction Assessment



METAL CASTING AND HEAT TREATING

11.1 Casting

- a) Alter raw materials ① ② ③ ④ ⑤
- b) Convert to induction furnace ① ② ③ ④ ⑤
- c) Use alternate de-sulfurization agent ① ② ③ ④ ⑤
- d) Alter product specification ① ② ③ ④ ⑤
- e) Improve process control ① ② ③ ④ ⑤
- f) Keep waste segregated ① ② ③ ④ ⑤
- g) Charge dust to furnace ① ② ③ ④ ⑤
- h) Employ pyrometallurgical recovery ① ② ③ ④ ⑤
- i) Employ rotary kiln technology ① ② ③ ④ ⑤
- j) Employ electrothermic shaft process ① ② ③ ④ ⑤
- k) Enrich zinc oxide ① ② ③ ④ ⑤
- l) Sell dust to cement plant ① ② ③ ④ ⑤
- m) Screen metal from sand ① ② ③ ④ ⑤
- n) Reclaim metal and sand ① ② ③ ④ ⑤
- o) Employ wet washing/scrubbing ① ② ③ ④ ⑤
- p) Employ thermal reclamation ① ② ③ ④ ⑤
- q) Reuse treated sand ① ② ③ ④ ⑤
- r) Sell sand as fill material ① ② ③ ④ ⑤

11.2 Heat treating

- a) Alter raw materials ① ② ③ ④ ⑤
- b) Clean parts before treatment ① ② ③ ④ ⑤
- c) Use graphite covers on cyanide bath ① ② ③ ④ ⑤
- d) Dry work before case hardening ① ② ③ ④ ⑤
- e) Periodically clean baths ① ② ③ ④ ⑤
- f) Minimize drag-out ① ② ③ ④ ⑤
- g) Replace pot linings ① ② ③ ④ ⑤
- h) Control temperature of quench baths ① ② ③ ④ ⑤
- i) De-sludge quenchant oil baths ① ② ③ ④ ⑤
- j) De-water quenchant oil baths ① ② ③ ④ ⑤
- k) Ultra-filter water polymer baths ① ② ③ ④ ⑤

Waste Reduction Assessment



11.3 Metal parts cleaning and stripping

- a) Improve process controls ① ② ③ ④ ⑤
- b) Provide operator training ① ② ③ ④ ⑤
- c) Improve drainage techniques ① ② ③ ④ ⑤
- d) Implement better storage & distribution methods ① ② ③ ④ ⑤
- e) Use vapor degreasers ① ② ③ ④ ⑤
- f) Cover immersion tanks / use tank lids ① ② ③ ④ ⑤
- g) Install drain boards ① ② ③ ④ ⑤
- h) Employ material substitution ① ② ③ ④ ⑤
- i) Remove sludge ① ② ③ ④ ⑤
- j) Use water based binders for abrasives ① ② ③ ④ ⑤
- k) Use liquid spray abrasives ① ② ③ ④ ⑤
- l) Pre-clean work pieces ① ② ③ ④ ⑤
- m) Filter solvents ① ② ③ ④ ⑤
- n) Distill solvents ① ② ③ ④ ⑤
- o) Reuse blast media ① ② ③ ④ ⑤

11.4 Metal surface treating and plating

- a) Reduce drag-out, spills, and leaks ① ② ③ ④ ⑤
- b) Provide efficient drainage ① ② ③ ④ ⑤
- c) Control viscosity and surface tension ① ② ③ ④ ⑤
- d) Filter bath solutions ① ② ③ ④ ⑤
- e) Monitor and control bath solution ① ② ③ ④ ⑤
- f) Incorporate still rinse design ① ② ③ ④ ⑤
- g) Employ counter-current rinsing ① ② ③ ④ ⑤
- h) Assure efficient drainage ① ② ③ ④ ⑤
- i) Use no-rinse coating ① ② ③ ④ ⑤
- j) Substitute cadmium or chromium plating ① ② ③ ④ ⑤
- k) Use immiscible rinse ① ② ③ ④ ⑤
- l) Recycle process baths ① ② ③ ④ ⑤
- m) Recycle rinse water ① ② ③ ④ ⑤

Waste Reduction Assessment



TEXTILE AND CARPET MILL

13.1 Dyeing and Water Use

- a) Counter-current washing ① ② ③ ④ ⑤
- b) Reuse final rinse water from dyeing for dye bath make-up ① ② ③ ④ ⑤
- c) Reuse soaper wastewater ① ② ③ ④ ⑤
- d) Reuse of scouring rinses for desizing ① ② ③ ④ ⑤
- e) Reuse of mercerizing or bleach washwater for scouring or desizing ① ② ③ ④ ⑤
- f) Recycle/reuse of water jet weaving wastewater ① ② ③ ④ ⑤
- g) Use of automatic shutoff valves ① ② ③ ④ ⑤
- h) Use of flow or pressure control valves ① ② ③ ④ ⑤
- i) Eliminate unnecessary washing of fabric & equipment ① ② ③ ④ ⑤
- j) Production practices reviews ① ② ③ ④ ⑤
- k) Leak minimization ① ② ③ ④ ⑤
- l) Spill minimization ① ② ③ ④ ⑤
- m) Proper maintenance ① ② ③ ④ ⑤
- n) Employee education ① ② ③ ④ ⑤
- o) Dyebath or bleach bath reconstitution & reuse ① ② ③ ④ ⑤
- p) Brine or chemical recovery with membrane filtration ① ② ③ ④ ⑤
- q) Production sequencing (eg. Light to dark dyeing) ① ② ③ ④ ⑤

13.2 Hazardous Waste Minimization

- a) Production planning and sequencing ① ② ③ ④ ⑤
- b) Process/equipment adjustment or modification ① ② ③ ④ ⑤
- c) Raw material substitution ① ② ③ ④ ⑤
- d) Loss prevention and housekeeping ① ② ③ ④ ⑤
- e) Waste segregation and separation ① ② ③ ④ ⑤

13.3 Solid Wastes

- a) Recovery and recycle of trim ① ② ③ ④ ⑤
- b) Recycle shearing waste ① ② ③ ④ ⑤
- c) Reuseable shipping containers (pallets; gaylords) ① ② ③ ④ ⑤
- d) Reuse of spindles or cores ① ② ③ ④ ⑤
- e) Recycle shipping packaging (cardboard; strap; wrap) ① ② ③ ④ ⑤
- f) Recycle waste yarn ① ② ③ ④ ⑤
- g) Post-consumer product recovery ① ② ③ ④ ⑤
- h) Use of recycled products as raw material ① ② ③ ④ ⑤



N-20-601 - NA
N-20-602 / 4

Energy and Environmental Management Center

Mr. Greg Andrews
Program Manager
Georgia Pollution Prevention Assistance Division
Suite 450
7 Martin Luther King Jr. Dr.
Atlanta GA 30334-9004

August 26, 1997

**SUBJECT: Contract N-20-601: ONE YEAR SERA AGREEMENT and
Contract N-20-602: P²AD SUPPORT SERVICES AGREEMENT
Quarterly Report; Performance Period May 1997 - July 1997**

Dear Mr. Andrews:

Please find the captioned report of Georgia Tech activities for your review. I trust our performance meets your expectations. Please call if you have questions or comments.

Respectfully Submitted,

John C. Adams, P.E.
Georgia Environmental Partnership
Georgia Tech Economic Development Institute

Enclosures

cc: Dr. David S. Clifton, Director
Center for International Standards and Quality
Dr. Jackie Sellers, Public Services Associate
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A Unit of the University System of Georgia An Equal Education and Employment Opportunity Institute

Quarterly Progress Report

ONE YEAR SERA AGREEMENT
and
P²AD SUPPORT SERVICES AGREEMENT

Contract Number: Contract N-20-601 and Contract N-20-602
Performance Period: May 1997 - July 1997

Sponsored By:

GEORGIA POLLUTION PREVENTION ASSISTANCE DIVISION
Suite 450
7 Martin Luther King Jr. Dr.
Atlanta GA 30334-9004

Submitted By:

Georgia Tech Economic Development Institute
Georgia Institute of Technology
Atlanta GA 30332-0640

August 25, 1997

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1.0 Executive Summary (Printed in each quarterly report)

This document defines the scope of work and progress of the Georgia Tech Economic Development Institute (EDI) and Georgia Tech Research Institute (GTRI) in concert with the Pollution Prevention Assistance Division (P²AD) and the University of Georgia in establishing and operating the Georgia Environmental Partnership (GEP) via funding provided by the Southeastern Environmental Resources Alliance (SERA), P²AD, and in-house cost share. This program is made possible via two contracts with the Georgia Tech Research Corporation: "One Year SERA Agreement" and "P²AD Support Services Agreement". Even though these are two unique contracts with unique deliverables, for the purposes of report brevity, the delivery of effort under the agreements is combined below in a single report outlining our GEP efforts. Because these efforts are in partnership with the two other operations listed above, we acknowledge the efforts reported below involve the other members of the partnership where the lead role and source of success may well be any one of the three partners.

The following program tasks generalize the overall effort:

Task 1. Technical Assistance

EDI will provide general environmental assessments to individual companies in the form of on-site assessments at industrial facilities throughout Georgia. These assessments are designed to identify potential energy efficiency, environmental compliance, and/or pollution prevention concerns. On-site assessments will be conducted at numerous plants using EDI's existing staff of field agents and skill center specialists.

The assessments will be preliminary in nature (feasibility grade) requiring 2-3 man days of effort each. More complex or involved assessments (requiring detailed analysis of pollution prevention concepts, measures, and technologies) will be referred to P²AD's pollution prevention staff engineers, especially where broad application of the results in the state is desirable.

Task 2. Regional Seminars

EDI will conduct geographically based seminars. Development and planning functions will be coordinated with P²AD's public outreach coordinators. Seminars will deal with topics germane to the needs of Georgia industries. EDI will arrange meeting space, marketing services, and informational materials through its network of regional offices.

Task 3. Industry Sector Seminars

EDI will assist P²AD in the development of three industry sector specific seminars. EDI will identify speakers and develop materials as requested by P²AD with particular emphasis on matters relating to industrial energy efficiency and environmental compliance. P²AD will assume primary responsibility for the presentation of information pertaining to pollution prevention measures and technologies. EDI, in conjunction with P²AD's public outreach coordinators, will be responsible for the planning and logistical support for the seminars, including but not limited to, advertising, site selection, and recruitment of speakers.

Task 4. Support and Promotion

EDI will provide training, resource identification/referral and management support, where appropriate, in support of implementation projects conducted by SERA in Georgia.

EDI will prepare fact sheets on energy efficiency, environmental compliance, and pollution prevention methodologies. These fact sheets will identify common environmental management problems and provide information requirements, economic justifications, and sources for additional materials.

EDI will participate in trade shows and conferences to promote the environmental management services provided by the Georgia Partners. This task will include the operation of exhibits and information booths and the delivery of presentations at environmental conferences throughout the region.

Task 5. Industry Networks

EDI will develop a regionally based system of industry networking groups. The purpose of these groups is to promote information exchange, problem solving, and mentoring among neighboring facilities. EDI will enlist the support and assistance of trade organizations, and/or local chambers of commerce. As many as nine industry networking groups may be developed through EDI regional offices around the state.

EDI will participate in the development of a pollution prevention excellence recognition (Pollution Prevention Partners) program including promotion and award recipient(s) screening.

2.0 Project Reports, Budget Status & Program Schedules: One Year SERA Agreement

2.1 Program Activities for the May 1997 - July 1997 Quarter

This section describes activities that have occurred during the captioned quarter. A perspective of how these items compare to the goals in the contract as depicted in the program schedule is presented in Section 2.2.

2.1.1 On-Site Assessments

The primary mission of this quarter has been providing on-site assessments, in-plant consultations, workshops/seminars and the development of on-site assessment tools. Also, we will continue internal training of GEP field agents. The individuals listed below from Georgia Tech Economic Development Institute (EDI) and Georgia Tech Research Institute (GTRI) compose the GEP/EDI team:

John Adams (Program Coordinator) Atlanta, GA (404)894-4138	Jerry Zolkowski Dalton, GA (706)272-2702
Mike Brown Atlanta, GA (404)894-6107	Steve Cowart Douglas, GA (912)384-1121
Bill Meffert Atlanta, GA (404)894-3844	Paul Schlumper Atlanta, GA (404)894-8082
Ed Hardison Albany, GA (912)430-4188	Chris Downing Griffin, GA (770)412-4081
Robert Hitch Columbus, GA (706)568-2482	George Lee Macon, GA (912)751-6190
Roc Tshirhart Atlanta, GA (404)894-8045	Russ Ray Atlanta, GA (404)894-8058
Jim Walsh Atlanta, GA 894-3806	Deann Desai Atlanta, GA (404)894-2483
Randy Green Dublin, GA (912) 275-6543	

In addition, the following individuals assist with the coordination and logistics of producing GEP's Environmental Network meetings:

Karen Fite Athens GA (706) 542-8901	Larry Alford Morrow GA (770) 960-2153
Tianna Marynell Augusta GA (706) 737-1414	Melanie Largin Cartersville GA (770) 387-4084

The individuals above have been selected for their location, technical background and resources they bring to the program. Because of widely varying backgrounds of GEP staff, an internal training program of technical sessions conducted every few months is underway in an effort to standardize the services offered by each of the team members. These sessions have been held on April 24-25, August 28-29, December 12, with sessions planned for September 30, December 12, March 17, 1998, June 16, and August 18. In addition, all staff members are invited and encouraged to attend the numerous workshops produced by GEP and advertised on our web site.

Headed by Bob Hitch, GEP has completed the development phase of an industry specific pollution prevention audit tool which will further enable field agents (with minimal pollution of prevention expertise) to offer a consistent framework for in-plant assessments. See Attachment I for the latest draft of the tool. Also in-process is an energy usage assessment tool under the direction of Mike Brown. These tools are presently in the beta test stage with the more skillful GEP members using them during their regular in-plant consultations. Final modifications will be incorporated during the fourth quarter of the program based on the experiences of the in-plant testing. After a training session tentatively scheduled this summer, the tools will be available for use by all GEP members. We even plan to market the tools to other state pollution prevention divisions and NIST manufacturing extension partnerships. Note: The tools are not designed to offer the level of detail that is typically provided by experts, but it will offer a greater depth and level of consistency than could be expected by only providing general field agent training.

In-plant assessments is made in coordination with Pollution Prevention Assistance Division (P²AD). The general practice has been established to route facility assistance requests through P²AD. These requests are then evaluated with EDI responding to those requests forwarded for field agent support. In addition, field agents respond to local requests as a matter of routine. These routine requests involve a wide range of support from locating recycling vendors to developing model Title V Air Permit applications for carpet manufacturers.

EDI/GEP on-site assessments performed and/or in-progress this quarter include:

Allied-Signal Laminate Systems - Energy and waste minimization study
Food Ingredients Technology - Energy and waste minimization study
Riverbend Finishing - Energy and waste minimization study
Purafil - Energy and waste minimization study
Pak-Lite - Energy and waste minimization study
SmithKline Beecham - Energy and waste minimization study
Thomas Packing - Energy and waste minimization study
Dittler Brothers, Inc. - Energy and waste minimization study
American Dehydrated Foods - Energy and waste minimization study
House Parts, Inc. - Energy and waste minimization study
Springs Industries - Energy and waste minimization study
Shaw Industries - Energy and waste minimization study
Atlas Roofing, Inc. - Energy and waste minimization study
U.S. Gypsum Corp. - Energy and waste minimization study
Horton Homes, Inc. - Indoor air emissions analysis
Toppan Interamerica, Inc.- Energy and waste minimization study
Ru Wood, Inc. - Wood waste reuse consultation
Carrier Transicold - ISO 14001 Baseline audit
AT&T - ISO 14001 Gap Analysis
Harrell Manufacturing, Inc. - Environmental compliance consultation
Sunnyland Farms - Stormwater consultation
AAA Cleaning, Inc. - Recycle pecan hulls consultation
Rustan, Inc. - Wastewater treatment consultation
Rogers Finishing - Air emissions consultation
Blue Circle Cement – ISO 14001 gap analysis
J.H. Williams Co. – ISO14001 audit
Plicon – Environmental compliance & 7(c)1 audit
Pratt & Whitney - Waste min. Assessment
Tom's Foods - Waste min. Assessment
Rogers' Finishing - Energy/waste audit and Prep of a Generic Stormwater Pollution Prevention Plan

EDI/GEP in-plant assessments backlog (pending on facility providing operating information necessary to initiate a study):

E.O. Footwear - Energy and waste minimization study
Engineered Fabrics - Energy and waste minimization study
Star Packaging - Improved industrial fume exhaust system design
Semco Manufacturing - Study for a laboratory energy recovery system
Gourmet Concepts, Inc. - Energy and waste minimization study

EDI/GEP in-plant assessments planned for next quarter (continued):

Universal Rundle, Inc. - Energy and waste minimization study
Brake Pro, In. - Energy and waste minimization study
Kimoto Tech Inc. - Energy and waste minimization study
Habersham Metal Products, Inc. - Energy and waste minimization study
Belt Corp. of America, Inc. - Energy and waste minimization study
Alken-Ziegler, Inc. - Energy and waste minimization study
Patterson Pump, Inc. - Energy and waste minimization study
Columbus Foundries, Inc. - Energy and waste minimization study
Southeastern Forge, Inc. - Energy and waste minimization study
Sola Electric - Energy and waste minimization study
Oriental Weavers of America - Energy and waste minimization study
Perception Corporation - Energy and waste minimization study
Callaway Chemical - Waste minimization assessment
Cessna Aircraft Components - Waste minimization assessment
AAA Modular Buildings - Waste minimization assessment

EDI/GEP information requests and consultations provided this quarter include:

Foster Lumber - Utility purchase, environmental compliance plan, and
waste minimization study
City of Roberta – Recycle Depot Design
S & C Supply – New facility design energy and waste considerations
Southeast Paper – Waste movement paper logistics

2.1.2 Sector Specific Training

For sector specific training endeavors, see the various sections below.

2.1.3 Regional Seminars

Group technology transfer preparation and production for state regions is as indicated below:

“ISO 14000 Overview”, 2/11
“ISO 14000 International Standards Systems Documentation”, 02/11-12
“Power Demand Management”, 2/11, 5/15
“Boilers and Steam Systems”, 2/20, 4/22, 05/06
“SARA Title III Workshop”, April ‘1997

2.1.3 Regional Seminars (Continued)

“Solvent Management”, April '97

“The New Wetlands Rules”, April

“Solvent Reduction in the Carpet Industry”, February 6

“Manufacturing Excellence Conference: Best Practices for the 21st Century”, Planned for September 11-12, 1997

2.1.4 Awareness Events

EDI provides ongoing support to P²AD by participating in awareness events via manning our GEP trade show booth. This quarter the booth was not manned at any events.

2.1.6 Database Information Input

The environmental database development effort is headed by the University of Georgia. EDI provides support to the effort. The leader in support of this effort for EDI is John Adams. Support for this project component is as requested/as needed and ongoing.

2.1.7 Savannah River Plant and SERA Interface

Support for this project component is as requested/as needed and ongoing. Support for this program component is headed by John Adams. During this quarter, Mr. Adams attended two SERA Board meetings.

2.1.8 Project Administration

The program is administered by John Adams. He is responsible for day to day administrative functions, resource allocation, and reporting.

2.2 Program Schedule

Exhibit 2.2.A, attached, summarizes EDI's performance on the program, effective August 1. It also shows the contract deliverables and current program status.

2.3 Budget Summary

Exhibit 2.3.A, attached, depicts EDI's cost performance on the program, effective July 31

(August accounting data is not available at the time of this writing). The chart represents current and planned expenditures.

3.0 Project Reports, Budget Status & Program Schedules: P²AD Support Services Agreement

3.1 Program Activities for the May 1997 - July 1997 Quarter

3.1.1 On-site Assessments

On-site assessments completed in concert with P²AD for the program to date include:

Atlanta Film Converting
Initial Visit: 4/18/96
Project Completion: 6/24/96

American Dehydrated Foods
Initial Visit: 04/03/97
Project Completion: June 1997

Fresh Express
Initial Visit: 09/25/96
Project Completion: December 1996

World Carpets Manufacturing of Dalton
Initial Visit: 10/30/96
Project Completion: May 1997

World Carpets Spinning of Dalton
Initial Visit: 10/30/96
Project Completion: May 1997

Blue Circle Aggregates
Initial Visit: 12/13/96
Project Completion: March 1997

Blue Circle Cement
Initial Visit: 01/14/96
Project Completion: April 1997

Lacey Mills
Initial Visit: 4/23/97
Project Completion: June 1997

Ongoing assessments to be produced in concert with P²AD include:

Engineered Products
Initial Visit: August 1997
Anticipated Completion: October 1997

Marriott Marquis
Initial Visit: August 1997
Anticipated Completion: October 1997

Blue Circle Cement Recycle Committee
Initial Work Began: March 1997
Anticipated Completion: Ongoing

3.1.2 Pollution Prevention Workshops

Workshops produced in concert with P²AD for the program to date include:

“Wood Finishers and Furniture Manufacturers and Furniture Manufacturers Workshop and Teleconference”

Conducted on: 9/18/96 and 9/25/96
Attendance: 134

“Georgia Printer Partnership - Increasing Profits and Reducing Waste”

Conducted on: 01/21/97
Attendance: 63

“Shop Talk – Metal Finishing Made a Little Easier”

Conducted May 28, 1997
Attendance: 41

“Successful and Emerging Environmental Technologies in the Pulp and Paper Industry”

Planned for September 18-19, 1997.

Task	Description	Month(1)												Project Totals	Project Goals
		1	2	3	4	5	6	7	8	9	10	11	12		
1	On-Site Assessments	2	6	6	3	4	1		1	1	1	1	1	27	25
2	Sector Specific Training				1		1	1					1	4	4
3	Regional Seminars			2	1		1	4	1		3		3	15	12
4	Industry Sector Training		1		1		1	1	1					5	2
5	Awarness Events			2	1									3	3
6	Database Information Input (2)	000	000	000	000	000	000	000	000	000	000	000	000	000	000
7	SRP Interface (2)	000	000	000	000	000	000	000	000	000	000	000	000	000	000
8	Project Administration (2)	000	000	000	000	000	000	000	000	000	000	000	000	000	000

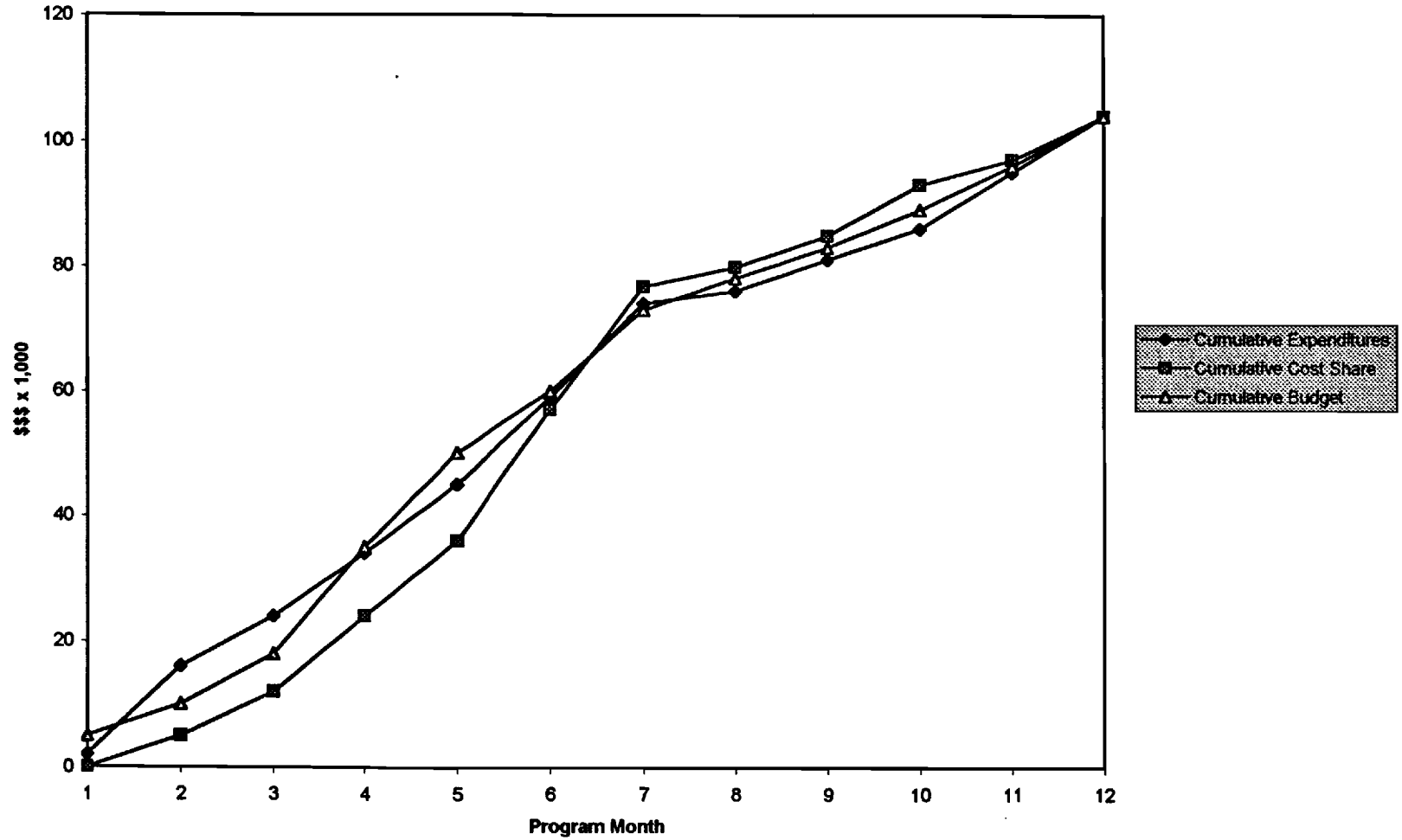
(1) Program formally initiated in August 1996. Planned completion date is September 30, 1997.

(2) Ongoing support as needed

One Year SERA Agreement Program Schedule and Accomplishments

Table 2.2.A

Exhibit 2.3.A
One Year SERA Agreement Budget Summary



3.1.3 Industry Networks

Development and production of pollution prevention networks in industry has been launched this quarter. We have selected eight sites for the initial network development efforts. These initial meetings will include speaker/discussion leaders provided by GEP. Future meetings are expected to provide a broad range of speakers and discussion leaders including local member testimonies. This endeavor is being lead by Ms. Deann Desai.

Year one network development activity includes:

Round One Theme: *SARA Reporting & Pollution Prevention Partners Program*

<u>Location</u>	<u>Date Planned</u>
Dalton	02/10/97
Athens	02/21/97
Augusta	02/14/97
Macon	02/17/97
Columbus	02/13/97
Albany	02/24/97
Douglas	02/26/97
Savannah	02/28/97

Round Two Theme: *Form R Reporting & Pollution Prevention Partners Program*

<u>Location</u>	<u>Date Planned</u>
Dalton	TBA
Athens	06/10/97
Augusta	06/17/97
Macon	06/19/97
Columbus	06/10/97
Albany	06/11/97
Douglas	06/20/97
Savannah	06/18/97
Cartersville	05/29/97
Morrow	06/03/97
LaGrange	06/10/97

Round Three Theme: Risk Management Plans

<u>Location</u>	<u>Date Planned</u>
Dalton	09/08/97
Athens	09/17/97
Augusta	11/11/97
Macon	10/16/07
Columbus	10/14/97
Albany	10/15/97
Douglas	10/15/97
Dublin	10/15/97
Savannah	10/14/97
Cartersville	10/07/97
Morrow	10/09/97
LaGrange	10/14/97
W. Atlanta	TBA

Attendance at the network meetings in total is 200-250 persons.

3.1.4 Pollution Prevention Partners (P³) Certification Program

Support for this project component is ongoing on an as needed basis. The EDI field agents have been made aware of the program and brochures have been distributed to each office. Additional training is planned to enable field agents to provide in-plant support, verification, and applicant recruitment. Support for this program component is headed by John Adams.

3.2. Program Schedule

Exhibit 3.2.A, attached, summarizes EDI's performance on the program, effective April 30. It also shows the contract deliverables and current program status.

3.3 Budget Summary

Exhibit 3.3.A and Exhibit 3.3.B, attached, summarizes EDI's cost performance on the program, effective March 31 (April accounting data is not available at the time of this writing). The chart represents current and planned expenditures.

4.0 Plans for the Next Quarter

Activities planned for next quarter include continuation and completion of the activities listed above. Efforts will also be focused on developing/establishing industry networks utilizing the information gained this quarter and providing a higher rate of deployment of on-site assessments.

Task	Description	Month(1)												Project Totals	Project Goals
		1	2	3	4	5	6	7	8	9	10	11	12		
1	On-Site Assessments	1	1			1	1	1	2	1	1	2		11	5-10
2	P2 Workshops		2				1			1			1	5	2
3	Industry Networks Meetings						8			11			13	32	24
4	P3 Program Support (2)	000	000	000	000	000	000	000	000	000	000	000	000	000	000

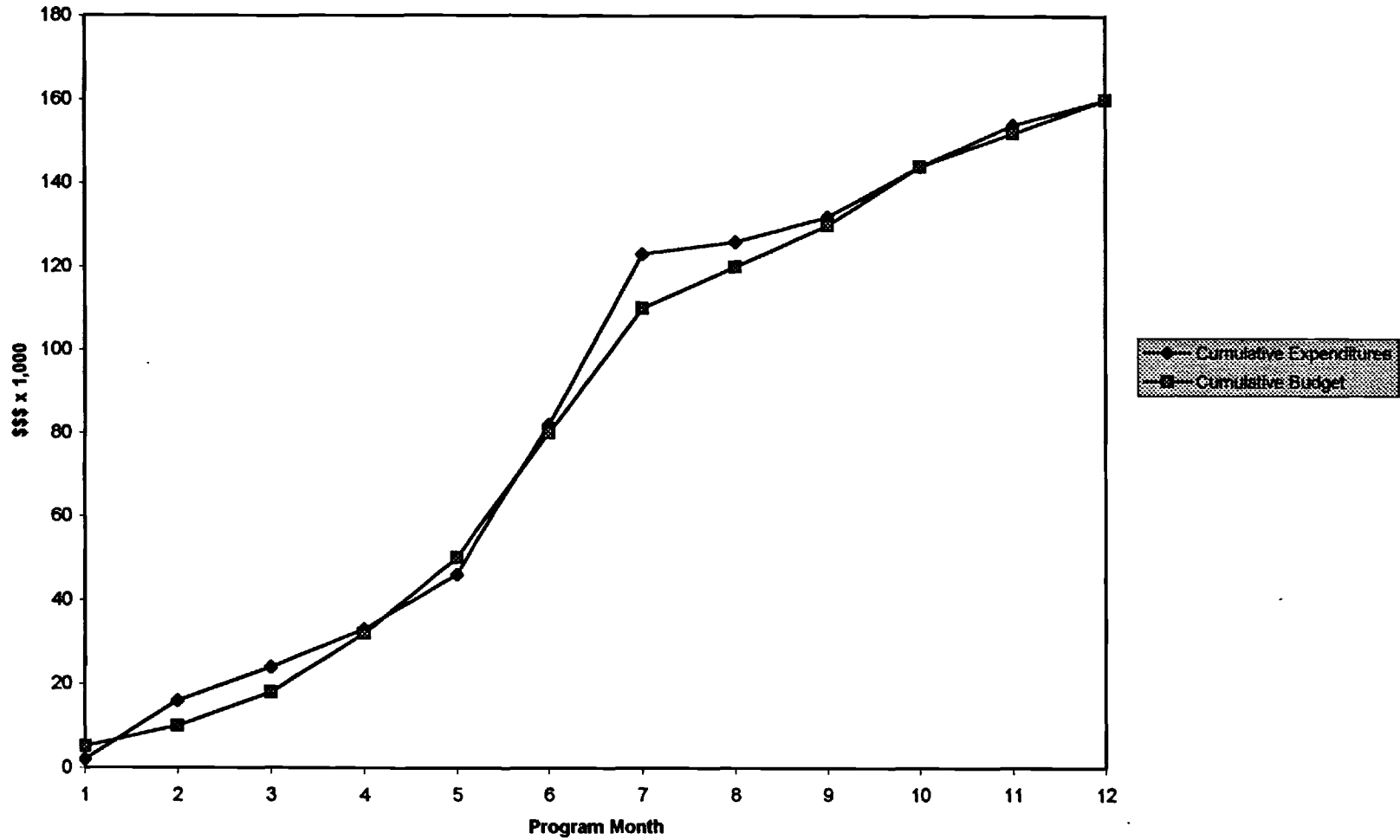
(1) Program formally initiated in August 1996. Planned completion date is September 30, 1997.

(2) Ongoing support as needed.

P2AD Support Services Agreement Program Schedule and Accomplishments

Table 3.2.A

Exhibit 3.3.A
P2AD Support Services Agreement



Task		Planned Budget	Actual Expenditures
1	On-Site Assessments	\$30,000	\$38,000
2	Pollution Prevention Workshops	\$30,000	\$36,000
3	Industry Networks	\$72,000	\$82,000
4	P3 Certification program	\$28,000	\$4,000
Totals		\$160,000	\$160,000

**Pollution Prevention Support Services
 Program Budget Expenditure Summary
 Exhibit 3.3.B**

Final Progress Report

ONE YEAR SERA AGREEMENT
And
P²AD SUPPORT SERVICES AGREEMENT

Contract Number: Contract N-20-601 and Contract N-20-602
Performance Period: August 1996 - October 1997

Sponsored By:

GEORGIA POLLUTION PREVENTION ASSISTANCE DIVISION
Suite 450
7 Martin Luther King Jr. Dr.
Atlanta GA 30334-9004

Respectfully Submitted By:

Georgia Tech Economic Development Institute
Georgia Institute of Technology
Atlanta GA 30332-0640

November 6, 1997

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4. Plans for the Next Quarter	13

1.0 Executive Summary

This document defines the scope of work and progress of the Georgia Tech Economic Development Institute (EDI) and Georgia Tech Research Institute (GTRI) in concert with the Pollution Prevention Assistance Division (P²AD) and the University of Georgia in establishing and operating the Georgia Environmental Partnership (GEP) via funding provided by the Southeastern Environmental Resources Alliance (SERA), P²AD, and in-house cost share. This program is made possible via two contracts with the Georgia Tech Research Corporation: "One Year SERA Agreement" and "P²AD Support Services Agreement". Even though these are two unique contracts with unique deliverables, for the purposes of report brevity, the delivery of effort under the agreements is combined below in a single report outlining our GEP efforts. Because these efforts are in partnership with the two other operations listed above, we acknowledge the efforts reported below involve the other members of the partnership where the lead role and source of success may well be any one of the three partners.

The following program tasks generalize the overall effort:

Task 1. Technical Assistance

EDI will provide general environmental assessments to individual companies in the form of on-site assessments at industrial facilities throughout Georgia. These assessments are designed to identify potential energy efficiency, environmental compliance, and/or pollution prevention concerns. On-site assessments will be conducted at numerous plants using EDI's existing staff of field agents and skill center specialists.

The assessments will be preliminary in nature (feasibility grade) requiring 2-3 man days of effort each. More complex or involved assessments (requiring detailed analysis of pollution prevention concepts, measures, and technologies) will be referred to P²AD's pollution prevention staff engineers, especially where broad application of the results in the state is desirable.

Task 2. Regional Seminars

EDI will conduct geographically based seminars. Development and planning functions will be coordinated with P²AD's public outreach coordinators. Seminars will deal with topics germane to the needs of Georgia industries. EDI will arrange meeting space, marketing services, and informational materials through its network of regional offices.

Task 3. Industry Sector Seminars

EDI will assist P²AD in the development of three industry sector specific seminars. EDI will identify speakers and develop materials as requested by P²AD with particular emphasis on matters relating to industrial energy efficiency and environmental compliance. P²AD will assume primary responsibility for the presentation of information pertaining to pollution prevention measures and technologies. EDI, in conjunction with P²AD's public outreach coordinators, will be responsible for the planning and logistical support for the seminars, including but not limited to, advertising, site selection, and recruitment of speakers.

Task 4. Support and Promotion

EDI will provide training, resource identification/referral and management support, where appropriate, in support of implementation projects conducted by SERA in Georgia.

EDI will prepare fact sheets on energy efficiency, environmental compliance, and pollution prevention methodologies. These fact sheets will identify common environmental management problems and provide information requirements, economic justifications, and sources for additional materials.

EDI will participate in trade shows and conferences to promote the environmental management services provided by the Georgia Partners. This task will include the operation of exhibits and information booths and the delivery of presentations at environmental conferences throughout the region.

Task 5. Industry Networks

EDI will develop a regionally based system of industry networking groups. The purpose of these groups is to promote information exchange, problem solving, and mentoring among neighboring facilities. EDI will enlist the support and assistance of trade organizations, and/or local chambers of commerce. As many as nine industry networking groups may be developed through EDI regional offices around the state.

EDI will participate in the development of a pollution prevention excellence recognition (Pollution Prevention Partners) program including promotion and award recipient(s) screening.

2.0 Project Reports, Budget Status & Program Schedules: One Year SERA Agreement

2.1 Program Progress - Activities for the August 1997 - October 1997 Quarter

This section describes activities that have occurred during the captioned quarter. A perspective of how these items compare to the goals in the contract as depicted in the program schedule is presented in Section 2.2.

2.1.1 On-Site Assessments

The primary mission of this quarter has been to conclude the contract deliverables and initiate the new contract. Ongoing activity has been to provide on-site assessments, in-plant consultations, workshops/seminars and the development of on-site assessment tools. Also, we have continued internal training of GEP field agents. The individuals listed below from Georgia Tech Economic Development Institute (EDI) and Georgia Tech Research Institute (GTRI) compose the GEP/EDI team:

John Adams (Program Coordinator) Atlanta, GA (404)894-4138	Jerry Zolkowski Dalton, GA (706)272-2702	Larry Alford Morrow Office (770) 960-2153
Mike Brown Atlanta, GA (404)894-6107	Steve Cowart Douglas, GA (912)384-1121	Karen Fite Athens Office (706)542-8901
Bill Meffert Atlanta, GA (404)894-3844	Paul Schlumper Atlanta, GA (404)894-8082	Tianna Marynell Augusta Office (706) 737-1414
Ed Hardison Albany, GA (912)430-4188	Chris Downing Griffin, GA (770)412-4081	Randy Green Dublin, GA (912) 275-6543
Robert Hitch Columbus & Gainesville, GA (706)568-2482/(770) 535-5728	George Lee Macon, GA (912)751-6190	Deann Desai Atlanta, GA (404)894-2483
Roc Tshirhart Atlanta, GA (404)894-8045	Russ Ray Atlanta, GA (404)894-8058	Jim Walsh Atlanta, GA 894-3806
Melanie Largin Cartersville GA (770) 387-4084		

This listing of individuals above has been expanded to maintain good coverage of the state. They have been selected for their location, technical background and resources they bring to the program. Because of widely varying backgrounds of GEP staff, an internal training program of technical sessions conducted every few months is underway in an effort to standardize the services offered by each of the team members. These sessions have been held on December 12, 1996, April 24-25, September 30, 1997 with sessions planned for December 11, March 12, 1998, June 16, and August 18. In addition, all staff members are invited and encouraged to attend the numerous workshops produced by GEP and advertised on our web site.

Headed by Bob Hitch, GEP has completed an industry specific pollution prevention audit tool which will further enable field agents (with minimal pollution of prevention expertise) to offer a consistent framework for in-plant assessments. Please see the binder attached.

Also in-process is an energy usage assessment tool under the direction of Chris Downing. This tool is presently in the beta test stage with the more skillful GEP members using them during their regular in-plant consultations. Final modifications will be incorporated during the fall based on the experiences of the in-plant testing. After a training session tentatively scheduled for the December 11, 1997 GEP technical session, the tool will be available for use by all GEP members. We even plan to market both tools to other state pollution prevention divisions and NIST manufacturing extension partnerships. Note: The tools are not designed to offer the level of detail that is typically provided by experts, but it will offer a greater depth and level of consistency for initial client consultations.

In-plant assessments are made in coordination with Pollution Prevention Assistance Division (P²AD). The general practice has been established to route facility assistance requests through P²AD. These requests are then evaluated with EDI responding to those requests forwarded for field agent support. In addition, field agents respond to local requests as a matter of routine. These routine requests involve a wide range of support from locating recycling vendors to developing model Title V Air Permit applications for carpet manufacturers.

EDI/GEP on-site assessments performed and/or in-progress this contract year include:

Ga. Plantation Shutter Company – Facility Compliance Assessment
Foster Lumber Company – New Facility Compliance Assessment
SmithKline Beecham Laboratories - Energy and waste minimization study
Marriott Marquis - Energy and waste minimization study
Engineered Fabrics Inc. - Energy and waste minimization study
E.J. Footware - Energy and waste minimization study
Panolam Industries, Inc. - Energy and waste minimization study
Rockwell International - Energy and waste minimization study

EDI/GEP on-site assessments performed and/or in-progress this contract year include (continued):

Allied-Signal Laminate Systems - Energy and waste minimization study
Food Ingredients Technology - Energy and waste minimization study
Riverbend Finishing - Energy and waste minimization study
Purafil - Energy and waste minimization study
Pak-Lite - Energy and waste minimization study
Thomas Packing - Energy and waste minimization study
Dittler Brothers, Inc. - Energy and waste minimization study
American Dehydrated Foods - Energy and waste minimization study
House Parts, Inc. - Energy and waste minimization study
Springs Industries - Energy and waste minimization study
Shaw Industries - Energy and waste minimization study
Atlas Roofing, Inc. - Energy and waste minimization study
U.S. Gypsum Corp. - Energy and waste minimization study
Horton Homes, Inc. - Indoor air emissions analysis
Southeastern Forge Inc. - Energy and waste minimization study
Lacey Mills - Energy and waste minimization study
World Carpets Inc. / Manuf. - Energy and waste minimization study
World Carpets Inc. / Spinning - Energy and waste minimization study
United Controls Int'l - Energy and waste minimization study
BASF - Energy and waste minimization study
Blue Circle Aggregates - Energy and waste minimization study
Caron Spinning - Energy and waste minimization study
Toppan Interamerica, Inc.- Energy and waste minimization study
Ru Wood, Inc. - Wood waste reuse consultation
Carrier Transicold - ISO 14001 Baseline audit
AT&T - ISO 14001 Gap Analysis
Harrell Manufacturing, Inc. - Environmental compliance consultation
Sunnyland Farms - Stormwater consultation
AAA Cleaning, Inc. - Recycle pecan hulls consultation
Rustan, Inc. - Wastewater treatment consultation
Rogers Finishing - Air emissions consultation
Blue Circle Cement – ISO 14001 gap analysis
J.H. Williams Co. – ISO14001 audit
Plicon – Environmental compliance & 7(c)1 audit
Pratt & Whitney – Energy and Waste min. Assessment
Tom's Foods - Waste min. Assessment
Rogers' Finishing - Energy/waste audit and Prep of a Generic Stormwater Pollution Prevention Plan
Foster Lumber – New Plant assistance
City of Roberta – Recycle Depot Design

EDI/GEP on-site assessments performed and/or in-progress this contract year include (continued):

S & C Supply – New facility design energy and waste considerations
Southeast Paper – Waste movement paper logistics

2.1.2 Sector Specific Training

For sector specific training endeavors, see the various sections below.

2.1.3 Regional Seminars

Group technology transfer preparation and production for state regions is as indicated below:

“ISO 14000 Overview”, 2/11
“ISO 14000 International Standards Systems Documentation”, 02/11-12
“Power Demand Management”, 2/11, 5/15
“Boilers and Steam Systems”, 2/20, 4/22, 05/06
“SARA Title III Workshop”, April ‘1997
“Solvent Management”, April ‘97
“The New Wetlands Rules”, April
“Solvent Reduction in the Carpet Industry”, February 6
“Manufacturing Excellence Conference: Best Practices for the 21st
Century, September 11-12, 1997

2.1.4 Awareness Events

EDI provides ongoing support to P²AD by participating in awareness events via manning our GEP trade show booth. This quarter the booth was not manned at any events.

2.1.6 Database Information Input

The environmental database development effort is headed by the University of Georgia. EDI provides support to the effort. The leader in support of this effort for EDI is John Adams. Support for this project component is as requested/as needed and ongoing.

2.1.7 Savannah River Plant and SERA Interface

Support for this project component is as requested/as needed and ongoing. Support for this program component is headed by John Adams. During this quarter, Mr. Adams attended two SERA meetings.

2.1.8 Project Administration

The program is administered by John Adams. He is responsible for day to day administrative functions, resource allocation, and reporting.

2.2 Program Schedule

Exhibit 2.2.A, attached, summarizes EDI's performance on the program, effective August 1, 1996. It also shows the contract deliverables and current program status.

2.3 Budget Summary

Exhibit 2.3.A, attached, depicts EDI's cost performance on the program, effective October 31. The chart represents current and planned expenditures.

3.0 Project Reports, Budget Status & Program Schedules: P²AD Support Services Agreement

3.1 Program Activities for the May 1997 - July 1997 Quarter

3.1.1 On-site Assessments

On-site assessments completed in concert with P²AD for the program to date include:

Atlanta Film Converting
Initial Visit: 4/18/96
Project Completion: 6/24/96

American Dehydrated Foods
Initial Visit: 04/03/97
Project Completion: June 1997

Fresh Express
Initial Visit: 09/25/96
Project Completion: December 1996

World Carpets Manufacturing of Dalton
Initial Visit: 10/30/96
Project Completion: May 1997

World Carpets Spinning of Dalton
Initial Visit: 10/30/96
Project Completion: May 1997

Blue Circle Aggregates
Initial Visit: 12/13/96
Project Completion: March 1997

Blue Circle Cement
Initial Visit: 01/14/96
Project Completion: April 1997
Assistance Ongoing

Lacey Mills
Initial Visit: 4/23/97
Project Completion: June 1997

Ongoing assessments to be produced in concert with P²AD include:

Engineered Fabrics
Initial Visit: August 1997
Anticipated Completion: October 1997

Marriott Marquis
Initial Visit: August 1997
Anticipated Completion: October 1997

Blue Circle Cement Recycle Committee
Initial Work Began: March 1997
Anticipated Completion: Ongoing

3.1.2 Pollution Prevention Workshops

Workshops produced in concert with P²AD for the program to date include:

**“Wood Finishers and Furniture Manufacturers and Furniture Manufacturers
Workshop and Teleconference”**

Conducted on: 9/18/96 and 9/25/96

Total Attendance: 134

“Georgia Printer Partnership - Increasing Profits and Reducing Waste”

Conducted on: 01/21/97

Attendance: 63

“Shop Talk – Metal Finishing Made a Little Easier”

Conducted May 28, 1997

Attendance: 41

“Successful and Emerging Environmental Technologies in the Pulp and Paper Industry”

September 18-19, 1997

Attendance: 58

Task	Description	Month(1)												Project Totals	Project Goals
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2	Sector Specific Training				1		1	1					1	4	4
3	Regional Seminars			2	1		1	4	1		3		3	15	12
4	Industry Sector Training		1		1		1	1	1					5	2
5	Awarness Events			2	1									3	3
6	Database Information Input (2)	000	000	000	000	000	000	000	000	000	000	000	000	000	000
7	SRP Interface (2)	000	000	000	000	000	000	000	000	000	000	000	000	000	000
8	Project Administration (2)	000	000	000	000	000	000	000	000	000	000	000	000	000	000

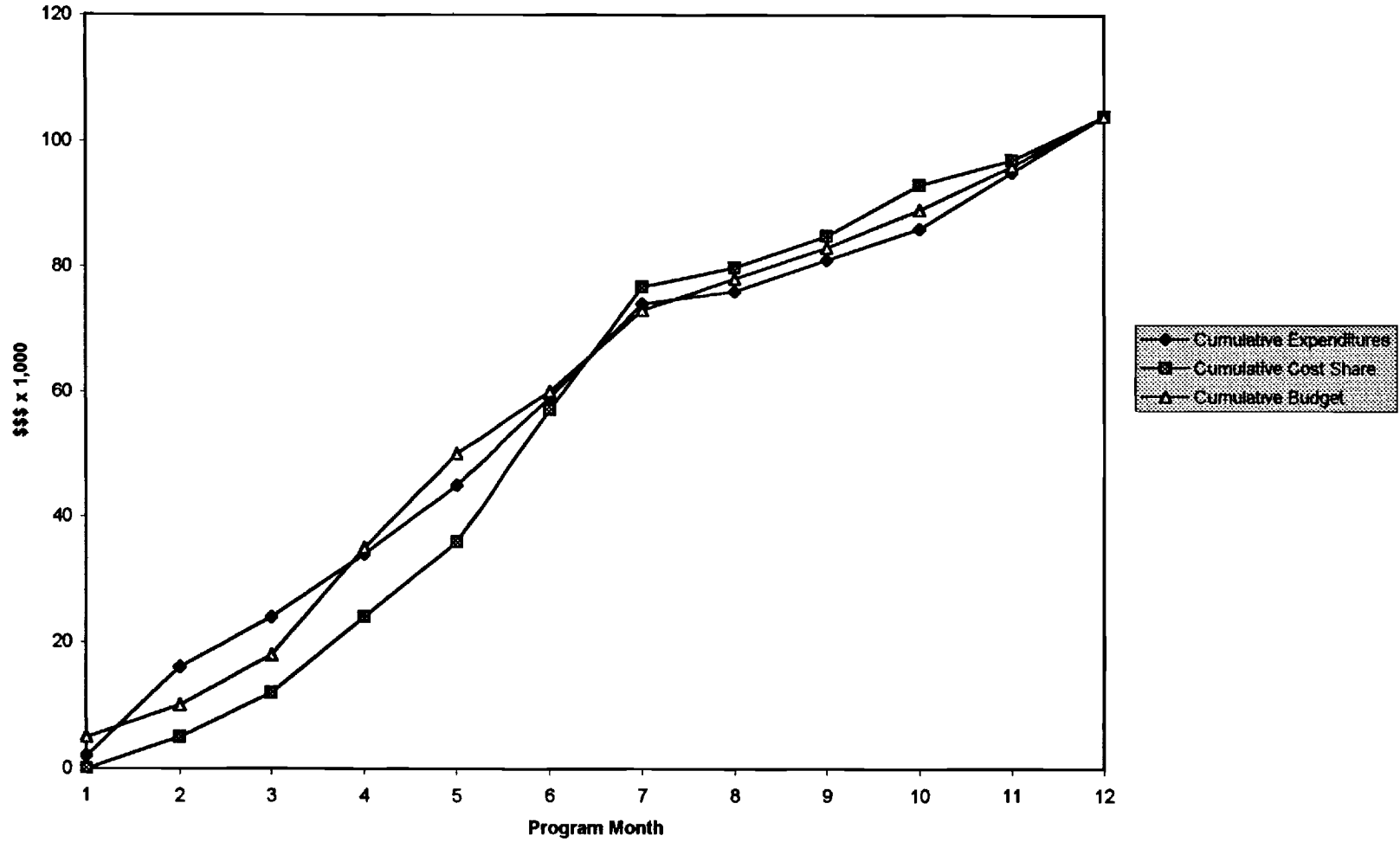
(1) Program formally initiated in August 1996. Planned completion date is September 30, 1997.

(2) Ongoing support as needed

One Year SERA Agreement Program Schedule and Accomplishments

Table 2.2.A

Exhibit 2.3.A
One Year SERA Agreement Budget Summary



3.1.3 Industry Networks

Development and production of pollution prevention networks in industry was launched this year. Eight sites for the initial network development efforts. Network meeting sites has been expanded to 13 locations. This endeavor is being lead by Ms. Deann Desai. Year one network development activity includes:

Round One Theme: *SARA Reporting & Pollution Prevention Partners Program*

<u>Location</u>	<u>Date Planned</u>
Dalton	02/10/97
Athens	02/21/97
Augusta	02/14/97
Macon	02/17/97
Columbus	02/13/97
Albany	02/24/97
Douglas	02/26/97
Savannah	02/28/97

Round Two Theme: *Form R Reporting & Pollution Prevention Partners Program*

<u>Location</u>	<u>Date Planned</u>
Dalton	TBA
Athens	06/10/97
Augusta	06/17/97
Macon	06/19/97
Columbus	06/10/97
Albany	06/11/97
Douglas	06/20/97
Savannah	06/18/97
Cartersville	05/29/97
Morrow	06/03/97
LaGrange	06/10/97

Round Three Theme: Risk Management Planning

<u>Location</u>	<u>Date Planned</u>
Dalton	09/08/97
Athens	09/17/97
Augusta	11/11/97
Macon	10/16/07
Columbus	10/14/97
Albany	10/15/97
Douglas	10/15/97
Dublin	10/15/97
Savannah	10/14/97
Cartersville	10/07/97
Morrow	10/09/97
LaGrange	10/14/97
W. Atlanta	TBA

Attendance at the network meetings in total is 200-250 persons.

3.1.4 Pollution Prevention Partners (P³) Certification Program

Support for this project component is ongoing on an as needed basis. The EDI field agents have been made aware of the program and brochures have been distributed to each office. Additional training is planned to enable field agents to provide in-plant support, verification, and applicant recruitment. Support for this program component is headed by John Adams.

3.2. Program Schedule

Exhibit 3.2.A, attached, summarizes EDI's performance on the program, effective October 31. It also shows the contract deliverables and current program status.

3.3 Budget Summary

Exhibit 3.3.A and Exhibit 3.3.B, attached, summarizes EDI's cost performance on the program, effective October 31. The chart represents current and planned expenditures.

4.0 Plans for the Next Quarter

Activities planned for next quarter include continuation and completion of the activities listed above. Initiate the follow-on contract. Efforts will also be focused on developing/establishing industry networks utilizing the information gained this quarter and providing a higher rate of deployment of on-site assessments.

Task	Description	Month(1)												Project Totals	Project Goals
		1	2	3	4	5	6	7	8	9	10	11	12		
1	On-Site Assessments	1	1			1	1	1	2	1	1	2		11	5-10
2	P2 Workshops		2				1			1			1	5	2
3	Industry Networks Meetings						8			11			12	31	24
4	P3 Program Support (2)	000	000	000	000	000	000	000	000	000	000	000	000	000	000

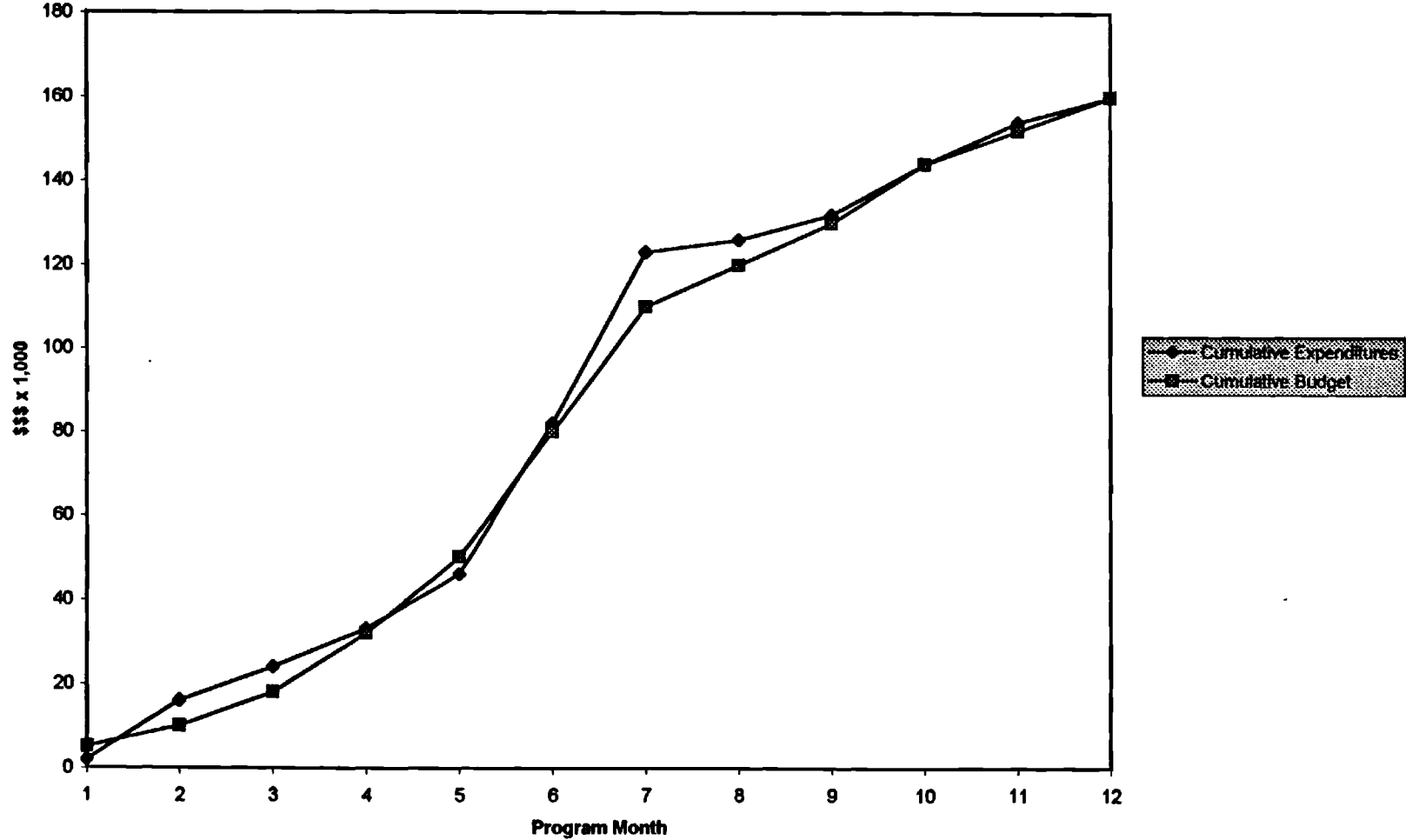
(1) Program formally initiated in August 1996. Planned completion date is September 30, 1997.

(2) Ongoing support as needed.

P2AD Support Services Agreement Program Schedule and Accomplishments

Table 3.2.A

Exhibit 3.3.A
P2AD Support Services Agreement



Task		Planned Budget	Actual Expenditures
1	On-Site Assessments	\$30,000	\$38,000
2	Pollution Prevention Workshops	\$30,000	\$36,000
3	Industry Networks	\$72,000	\$82,000
4	P3 Certification program	\$28,000	\$4,000
Totals		\$160,000	\$160,000

**Pollution Prevention Support Services
 Program Budget Expenditure Summary
 Exhibit 3.3.B**