

**Lee County Energy Recovery Facility  
SCR Search Summary Spreadsheet**

Contact Name	Company/Affiliation	Category	Date Contacted	Date Response Received	Status
Tony Licata	Babcock Borsig Power [Worcester, MA USA]	SCR Mfg	Aug. 13, 2001	Aug. 29, 2001	Waiting to send him flue gas flow data. Awaiting technical papers describing emissions limits and actual emissions data.
Peter Chromec	Babcock Borsig Power	SCR Mfg	Aug. 10, 2001	Sept. 19, 2001	Sent information Request, Received general info about European experience, nothing facility specific. Received invitation to visit Swiss plants.
Peter Chromec	Babcock Borsig Power	SCR Mfg	Oct. 15, 2001	Oct. 16, 2001	Requested information on operation and emissions of facilities and list of facilities. Received list from Alfred Muller.
Edmund Fleck	ALSTOM Power	SCR Mfg	Aug. 16, 2001	Aug. 16, 2001	Sent information request, received list of plants, awaiting feasibility response.
Victor Ciarlante	Hamon Research-Cottrell Foster Wheeler [Clinton, NJ USA]	SCR Mfg	Oct. 19, 2001	Oct. 19, 2001	No direct experience of SCR on MWCs
Jim Stone		SCR Mfg	Aug. 13, 2001		No response yet. Foster Wheeler is affiliated with Ishikawajima-Harima Heavy Industries Company of Japan.
Soren Olsen	Haldor Topsoe, Inc.		Aug. 10, 2001	Aug. 10, 2001	Does not have SCR experience on MWC or other dirty sources.
Curt McKee	Huntington Environmental		Aug. 10, 2001	Aug. 10, 2001	Does have SCR experience on diesel but not economical on a MWC.
Russ Gerlick	CRJ Catalysts		Aug. 10, 2001	Aug. 10, 2001	Does have experience on dirty sources that are cleaned.
Takayuki Hishinuma	Mitsubishi Heavy Ind.	SCR Mfg	Sept. 25, 2001		No response yet.
Kurtis Gentile	Mitsubishi Heavy Ind.	SCR Mfg	Oct. 17, 2001		Will contact Mr. Hishinuma with our request. No response yet.
Robert Reed	Siemens Westinghouse Power Generation Corp.	Catalyst Mfg	Aug. 13, 2001		He sent out information request to engineers in the Germany offices.
Andreas Klatt	Siemens AG	Catalyst Mfg		Aug. 21, 2001	Received list of European facilities, paper on SCR use in MWCs and presentation on SCR use.

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Paul James	European Integrated Pollution Prevention & Control Bureau (EIPPCB)	Gov't	Oct. 19, 2001, Oct. 22, 2001, Oct. 31, 2001	Oct. 31, 2001	Head of Waste Incineration Technical Work Group (TWG) of EIPPCB. Mr. James stated that the TWG has no info to date (kick-off meeting early December 2001). He suggested contacting the persons from the Netherlands on the TWG.
Laetitia Reynaud	Eur. Federation of Waste Mgmt & Enviro. Services	Gov't	Oct. 22, 2001		Sent email request. Said she would locate person with knowledge and respond to our request.
Eric Lesueur	Eur. Federation of Waste Mgmt & Enviro. Services (FEAD) Germany Federal	Gov't	Oct. 22, 2001		Sent email request. On EIPPCB's Technical Work Group. Nadine De Greef responded saying she forwarded my request to FEAD's members.
David van Lochem (Webmaster of Belgium's Environmental Department)	Environmental Agency Belgium Federal Department of the Environment Belgium Brussels Capital Region	Gov't	Oct. 18, 2001		Sent email request to get name and number of person with knowledge in Germany's federal gov't. No Response Yet.
info@ibgebim.be aminal@	Belgium Walloon Region	Gov't	Oct. 18, 2001	Oct. 19, 2001	Sent email requests to general information and two divisions within department to get name and number of persons with knowledge in Belgium's federal gov't. Told to contact the three regional gov'ts in Belgium.
lin.vlaanderen.be de.dgrme@	Belgium Flanders Region	Gov't	Oct. 19, 2001	Nov. 5, 2001	Sent email to region in Belgium (info@ibgebim.be) to get name and numbers of persons with SCR knowledge on MWCs. No Response Yet. Sent email to Flanders Region in Belgium (aminal@lin.vlaanderen.be) to get name and number of persons with SCR knowledge on MWCs. Filip Francois responded with website.
mrw.wallonie.be	Belgium Walloon Region Siemens AG [Redwitz, Germany]	Gov't Catalyst Mfg	Oct. 19, 2001 Oct. 22, 2001		Sent email to region in Belgium (de.dgrme@mrw.wallonie.be) to get name and number of persons with SCR knowledge on MWCs in their region. No Response Yet. Was to provide links to cost information in Europe. Have not received this info yet.
Andreas Klatt					

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	AGR Disposal - RZR Herten	Waste Disposal Company	Oct. 22, 2001		Sent email request. Has waste incineration plant in the District of Recklinghausen, Germany called RZR Herten
Roger Kohlmann	RWE Power	Waste Disposal Company	Oct. 22, 2001		Sent email request. Has refuse-fired power generating facility at Essen-Karnap (Germany)
Carl-Arne Pedersen	Renova AB (Sweden) Shanks Group plc (United Kingdom)	Waste Disposal Company	Oct. 22, 2001	Oct. 23, 2001	Sent email request. Has waste incinerator facility (Savenas) near Gothenburg, Sweden. Responded with two individuals to contact but did not provide means to contact them.
James Ray		Waste Disposal Company	Oct. 22, 2001	Oct. 22, 2001	Sent email request. Lists waste incineration among their services. Responded with link to www.eurits.org (mainly Hazardous Waste related) and United Kingdom de NOx policy
Mr. Goverde Ton	AVR	Waste Disposal Company	Oct. 22, 2001		Sent email request. Lists incineration of domestic residual wastes among their services. No response yet.
Al Linero/ Mike Halpin	Florida Department of Environmental Protection	Gov't	Oct. 22, 2001	Oct. 22, 2001	Called to determine whether Florida DEP has any information relative to SCR use on MWCs. Does not have an information.
Dennis Malone	Babcock Borsig Power [Worcester, MA USA]	SCR Mfg		Oct. 22, 2001	Received budget proposal for cold end SCR system.
Tony Licata	Babcock Borsig Power [Worcester, MA USA]	SCR Mfg		Oct. 25, 2001	Received information on installation experience with SCR on MWCs outside USA.
Ludwig Ramacher	Trienekens AG International Dutch Waste Processing	Waste Disposal Company		Oct. 23, 2001	Member of FEAD. Responded with leads to contact Markus Heering and Bernd Hausmann (Represents SCR Constructor) of EIPPCB TWG.
Katie Willis	Association (VVAV)	Waste Mgmt Assoc.		Oct. 24, 2001	Member of FEAD. Received paper presented in Paris, France in March 2001.

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Contact Name	Company/Affiliation	Category	Date Contacted	Date Response Received	Status
Gerard Harmsen	RIZA (The Netherlands Institute for Inland Water Management and Waste Water Treatment)	Gov't	Oct. 31, 2001	Nov. 5, 2001	At Paul James' (EIPPCB) suggestion, I called Mr. Harmsen who was about to leave for the day, suggested I email him then call on Nov. 5, 2001. Received response, he does incineration's water issues and suggested I contact Hans Holtring and Marcel Taal.
Hans W. Holtring	The Netherlands Ministry of Housing, Spatial Planning and the Environment	Gov't	Oct. 31, 2001 and Nov. 5, 2001		At Paul James' (EIPPCB) suggestion, I sent email request for information on SCR use on MWCs. No response yet.
Gert Stam	RIZA (The Netherlands Institute for Inland Water Management and Waste Water Treatment)	Gov't	Oct. 31, 2001		At Paul James' (EIPPCB) suggestion, I sent email request for information on SCR use on MWCs. No response yet.
Mr. Gerard de Vries	RIZA (The Netherlands Institute for Inland Water Management and Waste Water Treatment)	Gov't	Oct. 31, 2001		At Paul James' (EIPPCB) suggestion, I sent email request for information on SCR use on MWCs. No response yet.
Marcel Taal	INFOMIL (www.infomil.nl)	Gov't	Nov. 5, 2001	Nov. 9, 2001	At Gerard Harmsen's suggestion, I email Mr. Taal with info request and the four questions. Suggests contacting Mr. Gerben Timmer of Dutch Waste Processing Association (VWAV). Received draft document of Dutch (hazardous) waste incineration. Sent email follow-up asking for answers to our four questions on SCR use in Europe. Responded with individuals at two plants in Flanders.
Filip Francois	Belgium Flanders Region	Gov't	Nov. 5, 2001	Nov. 8, 2001	Sent information request email to plant director/co-director. Responded with information on their Belgium facility.
Mr. Jacques Soenens, Mr. Johan Bonnier	IMOG in Harelbeke (Flanders Belgium)	MWC Facility	Nov. 8, 2001	Dec. 5, 2001	Sent email to plant director/co-director asking for answers to our four questions on SCR emissions, cost, operation, downtime.

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Contact Name	Company/Affiliation	Category	Date Contacted	Date Response Received	Status
Dr. Markus Heering	VDMA	SCR Constructor Assoc.	Nov. 8, 2001	Nov. 14, 2001	Sent email request w/ four questions at suggestion of Ludwig Ramacher. He knowledge of technology but not cost and operation. Suggested to contact Martin GmbH in Munich (partner of Covanta)
Mr. Bernd Hausmann	EBA European Boilermakers' Association	SCR Constructor Assoc.	Nov. 8, 2001		Sent email request w/ four questions at suggestion of Ludwig Ramacher. No response yet.
Filip Francois	Belgium Flanders Region Seghers Better Technology	Gov't MWC Constructor	Nov. 8, 2001 Nov. 9, 2001	Nov. 9, 2001	Sent request for English translation of web site for IVAGO in Gent (Belgium) plant. No English translation. Given lead to contact Seghers Better Technology, builder of plant. Sent email to Seghers Better Technology (info_solid-air@bettertechnology.com) builder of the IVAGO in Ghent Belgium plant at suggestion of Filip Francois.
Mr. Gerben Timmer	Association (VVAV) Seghers Better Technology [Belgium Office]	Waste Mgmt Assoc. MWC Constructor	Nov. 9, 2001 Nov. 12, 2001	Nov. 9, 2001	At suggestion of Marcel Taal of INFOMIL, I emailed Mr. Timmer our four questions. Cannot provide detailed information. Sent copy of paper Katie Willis sent on Oct 24, 2001. Received names of four plant operators in The Netherlands. Sent paper presented at various symposia. Needs info on Lee County site prior to answering our questions. Provided www.scientecmatrix.com. Dirk Eeraerts of Atlanta, Ga office will call me.
Marcel Goermans	CRI Catalysts (Hague,	Catalyst			RTP received an email asking for our questions. Sent email with questions. Responded with our questions are site specific and beyond scope of CRI. Contact Mr. Per R. Nielsen of FLS Miljo Denmark (supplier of turn-key installation of facility in Roosendaal, The Netherlands.
Onno Maaskant	The Netherlands)	Mfg	Nov. 12, 2001	Nov. 12, 2001	

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Contact Name	Company/Affiliation	Category	Date Contacted	Date Response Received	Status
Mr. Per R. Nielsen	FLS Miljo Denmark	MWC	Nov. 12, 2001	Nov. 14, 2001	At Onno Maaskant's suggestion I emailed Mr. Nielsen and posed our four questions to him. He responded that he cannot provide the detailed information on the Roosendaal (The Netherlands) facility and suggested contacting Casper Stuard at plant.
Mr. Gerben Timmer	Dutch Waste Processing Association (VAV)	Waste Mgmt Assoc.	Nov. 13, 2001	Nov. 13, 2001	Called Mr. Timmer to get names of plant operators using SCR in The Netherlands. Emailed me names of four plants in The Netherlands.
Mr. Leo van Putten	AVR Rotterdam (Rotterdam City, The Netherlands)	MWC	Nov. 13, 2001	Nov. 21, 2001	Emailed Mr. van Putten to get info on their experience with SCR on their MWC. Responded with operational information.
Mr. Jean Luteijn	AVR Rozenburg (Rotterdam Harbor, The Netherlands)	Facility	Nov. 13, 2001	Nov. 26, 2001	Emailed Mr. Luteijn to get info on their experience with SCR on their MWC. Responded with facility specific information on AVR Rozenburg
Mr. Huub Nijkamp	Twence (Hengelo, The Netherlands)	MWC	Nov. 13, 2001	Nov. 14, 2001	Emailed Mr. Nijkamp to get info on their experience with SCR on their MWC. Replied that he would help us. Gave name of process engineer at plant.
Mr. Ron Slijster	HVC (Alkmaar, The Netherlands)	Facility	Nov. 13, 2001	Nov. 19, 2001	Emailed Mr. Slijster to get info on their experience with SCR on their MWC. Responded with operational and emissions information. No cost information given. I sent follow-up message (on Nov. 19, 2001) to clarify a few items.
Jurgen Bruggeman	Twence (Hengelo, The Netherlands)	MWC	Nov. 14, 2001		At suggestion of Mr. Nijkamp, I emailed Mr. Bruggeman (Process Engineer) to get info on their experience with SCR on their MWC. No response.
Dirk Eeraerts	Seghers Better Technology [Atlanta, GA Office]	Facility	Nov. 19, 2001	Nov. 27, 2001	Received call from Mr. Eeraerts as follow-up to Marcel Goemans email. I briefed him on the project and our needs and sent him an email and letter containing background information and our list of questions. Needs additional information.

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Contact Name	Company/Affiliation	Category	Date Contacted	Date Response Received	Status
Mr. Jonas Eek, CEO		Waste Disposal			Sent email request to these men to get operational information on their experience with SCR. Mr. Carl Arne Pedersen suggested I contact them but did not provide a means to contact them so I emailed a general mailbox for Renova.
Haakan Rylander	Renova AB (Sweden)	Company	Nov. 26, 2001		Responded with budget estimate for SCR system at Lee County ERF of \$8,200,000. Additional information verification is required.
Dirk Eraerts	Seghers Better Technology [Atlanta, GA Office]	MWC Constructor / Designer	Nov. 27, 2001	Dec. 6, 2001	Sent email to get further clarification of budget estimate.
Dirk Eraerts	Seghers Better Technology [Atlanta, GA Office]	MWC Constructor / Designer	Dec. 11, 2001		

Estimate of Selective Catalytic Reduction Costs  
for Lee County Energy Recovery Facility  
With Flue Gas Reheat Using Natural Gas Combustion

Cost Component	Costs	Basis of Cost Component
<b><u>Direct Capital Costs</u></b>		
SCR Associated Equipment	\$6,300,000	Vendor Estimate
Ammonia Storage Tanks	Included	Two Storage Tanks for Ammonia
Flue Gas Ductwork	\$386,000	Vatavuk, OAQPS Control Cost Manual, 1990
Instrumentation	Included	In-situ NOx Analyzer
Taxes	\$504,000	8% of Associated Equip.; OAQPS Control Cost Manual
Freight	\$315,000	5% of Associated Equip.; OAQPS Control Cost Manual
System Integration	\$100,000	Engineering Estimate
Firewater Booster Pump	\$23,000	Vendor Neutral Estimate
Increase ID Fan Size	\$343,000	Vendor Neutral Estimate; Increased size due to pressure drop across SCR System
<b>Total Direct Capital Costs (TDCC)</b>	<b>\$7,971,000</b>	
<b><u>Direct Installation Costs</u></b>		
Foundation and Supports	\$5,675,000	Vendor Estimate
Handling and Erection	Included	Included in Vendor Quote for Installation of SCR System
Electrical	Included	Included in Vendor Quote for Installation of SCR System
Piping	Included	Included in Vendor Quote for Installation of SCR System
Insulation for Ductwork	Included	Included in Vendor Quote for Installation of SCR System
Painting	\$30,000	SCR Structural Steel, Piping and Exposed Metals
Site Preparation	\$29,000	Existing Roads, Demolition & Restoration, SCR Footprint
Buildings	\$25,000	Engineering Estimate
Concrete	\$40,000	ID Fan Foundation, Aqueous Ammonia Spill Containment
Structural Steel	\$200,000	Windload Requirements for Hurricanes
Miscellaneous Steel	\$11,000	Platforms, Ladders, etc.
SCR Building Enclosure	\$330,000	Vendor Neutral Estimate
Electrical Systems	\$56,000	Grounding, Lightning Protection, Lighting, etc.
Instrumentation Systems	\$8,000	Piping Systems Monitoring
Piping Systems	\$216,000	Fire Protection Standpipe/Sprinklers, Steam, Service Air, relocate propane, potable water, anhydrous ammonia
Add. Contractor Costs for Above Work	\$100,000	10% of Additional Costs Not Included in Vendor Estimate
<b>Total Direct Installation Costs (TDIC)</b>	<b>\$6,720,000</b>	
<b>Total Capital Costs (TCC)</b>	<b>\$14,691,000</b>	Sum of TDCC and TDIC
<b><u>Indirect Costs</u></b>		
Engineering	Included	Included in Vendor Quote for SCR System
Construction and Field Expenses	Included	Included in Vendor Quote for SCR System
Contractor Fees	\$1,469,100	10% of TCC; OAQPS Control Cost Manual, Chapter 3
Project Management & Oversight	\$123,000	Vendor Neutral Estimate
Start-Up	\$293,820	2% of TCC; OAQPS Control Cost Manual, Chapter 3
Performance Tests	\$146,910	1% of TCC; OAQPS Control Cost Manual, Chapter 3
Contingencies	\$1,175,280	8% of TCC;
<b>Total Indirect Capital Costs (TIACC)</b>	<b>\$3,208,110</b>	
<b>Total Direct, Indirect and Capital Costs (TDICC)</b>	<b>\$17,899,110</b>	



Estimate of Selective Catalytic Reduction Costs  
for Lee County Energy Recovery Facility  
With Flue Gas Reheat Using Natural Gas Combustion

Cost Component	Costs	Basis of Cost Component
<b><u>Direct Annual Costs</u></b>		
Operating Personnel	\$56,160	24 hours/week at \$45/hour
Supervision	\$8,500	15% of Operating Personnel
Ammonia to control 260 ppm inlet NOx	\$380,000	\$300 per ton for Aqueous NH <sub>3</sub>
Catalyst Disposal Costs	\$15,000	Engineering Estimate
Catalyst Cost	\$90,000	1/3 Catalyst-3 year catalyst life
Contingency	\$62,466	10% of Direct Annual Costs
Regulatory Compliance Costs	\$25,000	Engineering Estimate
Miscellaneous Spare Parts	\$50,000	Vendor Neutral Estimate
<b>Total Direct Annual Costs (TDAC)</b>	<b>\$687,126</b>	
<b><u>Annual Energy Costs</u></b>		
Annual Electrical Energy Usage	\$191,876	476 kWh X 8,062 hours per year at \$0.05 per kWh
Annual Natural Gas Usage	\$932,940	186,588 Mcf at \$5.00 per 1000 cf of Natural Gas Based on Vendor Estimate
<b>Total Energy Costs (TEC)</b>	<b>\$1,124,816</b>	
<b><u>Indirect Annual Costs</u></b>		
Overhead	\$266,796	60% of Operating/Supervision Labor and Ammonia
Property Taxes	\$146,910	1% of Total Capital Costs
Insurance	\$146,910	1% of Total Capital Costs
Miscellaneous Painting	\$10,000	Vendor Neutral Estimate
Miscellaneous Equipment Rebuild	\$30,000	Vendor Neutral Estimate
Annualized Total Direct Capital	\$2,912,185	0.1627 Capital Recovery Factor of 10% over 10 years multiplied by sum of TDACC
<b>Total Indirect Annual Costs (TIAC)</b>	<b>\$3,512,801</b>	
<b>Total Annualized Costs</b>	<b>\$5,324,743</b>	Sum of TDAC, TEC and TIAC (for 260 ppm)
<b>Cost Effectiveness of SCR System</b>	<b>\$17,690</b>	Cost Per Ton NOx Removed 301 Tons NOx Removed (260 ppm inlet; 100 ppm outlet; 62% Removal)

Note: 'Included' denotes item is assumed to be included in vendor budgetary estimate for SCR Associated Equipment and Installation. [See letter from Dennis Malone (Babcock Borsig Power) to Michael Hober (RTP Environmental), dated October 19, 2001]

The above cost does not include revenue lost due to system shutdown. Based on a cost of \$56 per ton of waste at 600 tons of waste per day and over an annual shutdown of 10 days, this cost is estimated to be approximately \$336,000 due to lost tipping fees. In addition to this, the amount of revenue lost due to not producing steam during these 10 days is estimated to be approximately \$177,000; bringing the Total Annualized costs to \$5,837,743. Factoring these items into the Total Annualized Costs above, the cost effectiveness of the SCR system is estimated to be \$19,394 per ton of NOx removed.

Estimate of Selective Catalytic Reduction Costs  
for Lee County Energy Recovery Facility  
With Flue Gas Reheat Using Steam Diverted from Header

Cost Component	Costs	Basis of Cost Component
<b>Direct Capital Costs</b>		
SCR Associated Equipment	\$6,363,000	Vendor Estimate With 1% for Steam Coil System
Ammonia Storage Tanks	Included	Two Storage Tanks for Ammonia
Flue Gas Ductwork	\$386,000	Vatavuk, OAQPS Control Cost Manual, 1990
Instrumentation	Included	In-situ NOx Analyzer
Taxes	\$509,040	8% of Associated Equip.; OAQPS Control Cost Manual
Freight	\$318,150	5% of Associated Equip.; OAQPS Control Cost Manual
System Integration	\$100,000	Engineering Estimate
Firewater Booster Pump	\$23,000	Vendor Neutral Estimate
Increase ID Fan Size	\$343,000	Vendor Neutral Estimate; Increased size due to pressure drop across SCR System
<b>Total Direct Capital Costs (TDCC)</b>	<b>\$8,042,190</b>	
<b>Direct Installation Costs</b>		
Foundation and Supports	\$5,731,750	Vendor Estimate With 1% for Steam Coil System
Handling and Erection	Included	Included in Vendor Quote for Installation of SCR System
Electrical	Included	Included in Vendor Quote for Installation of SCR System
Piping	Included	Included in Vendor Quote for Installation of SCR System
Insulation for Ductwork	Included	Included in Vendor Quote for Installation of SCR System
Painting	\$30,000	SCR Structural Steel, Piping and Exposed Metals
Site Preparation	\$29,000	Existing Roads; Demolition & Restoration, SCR Footprint
Buildings	\$25,000	Engineering Estimate
Concrete	\$40,000	ID Fan Foundation, Aqueous Ammonia Spill Containment
Structural Steel	\$200,000	Windload Requirements for Hurricanes
Miscellaneous Steel	\$11,000	Platforms, Ladders, etc.
SCR Building Enclosure	\$330,000	Vendor Neutral Estimate
Electrical Systems	\$56,000	Grounding, Lightning Protection, Lighting, etc.
Instrumentation Systems	\$8,000	Piping Systems Monitoring
Insulation Systems	\$29,000	Insulating Steam Line to SCR Building
Piping Systems	\$216,000	Fire Protection Standpipe/Sprinklers, Steam, Service Air, relocate propane, potable water, anhydrous ammonia
Add. Contractor Costs for Above Work	\$100,000	10% of Additional Costs Not Included in Vendor Estimate
<b>Total Direct Installation Costs (TDIC)</b>	<b>\$6,805,750</b>	
<b>Total Capital Costs (TCC)</b>	<b>\$14,847,940</b>	Sum of TDCC and TDIC
<b>Indirect Costs</b>		
Engineering	Included	Included in Vendor Quote for SCR System
Construction and Field Expenses	Included	Included in Vendor Quote for SCR System
Contractor Fees	\$1,484,794	10% of TCC; OAQPS Control Cost Manual, Chapter 3
Project Management & Oversight	\$123,000	Vendor Neutral Estimate
Start-Up	\$296,959	2% of TCC; OAQPS Control Cost Manual, Chapter 3
Performance Tests	\$148,479	1% of TCC; OAQPS Control Cost Manual, Chapter 3
Contingencies	\$1,187,835	8% of TCC;
<b>Total Indirect Capital Costs (TIACC)</b>	<b>\$3,241,067</b>	
<b>Total Direct, Indirect and Capital Costs (TDICC)</b>	<b>\$18,089,007</b>	

Estimate of Selective Catalytic Reduction Costs  
for Lee County Energy Recovery Facility  
With Flue Gas Reheat Using Steam Diverted from Header

Cost Component	Costs	Basis of Cost Component
<b><u>Direct Annual Costs</u></b>		
Operating Personnel	\$56,160	24 hours/week at \$45/hour
Supervision	\$8,500	15% of Operating Personnel
Ammonia to control 260 ppm inlet NOx	\$380,000	\$300 per ton for Aqueous, NH <sub>3</sub>
Catalyst Disposal Costs	\$15,000	Engineering Estimate
Catalyst Cost	\$90,000	1/3 Catalyst-3 year catalyst life
Contingency	\$62,466	10% of Direct Annual Costs
Regulatory Compliance Costs	\$25,000	Engineering Estimate
Miscellaneous Spare Parts	\$50,000	Vendor Neutral Estimate
<b>Total Direct Annual Costs (TDAC)</b>	<b>\$687,126</b>	
<b><u>Annual Energy Costs</u></b>		
Annual Electrical Needs	\$191,876	476 kWh X 8,062 hours per year at \$0.05 per kWh
Annual Lost Electrical Revenue	\$273,000	Engineering Estimate (Steam Reheat)
<b>Total Energy Costs (TEC)</b>	<b>\$464,876</b>	
<b><u>Indirect Annual Costs</u></b>		
Overhead	\$266,796	60% of Operating/Supervision Labor and Ammonia
Property Taxes	\$148,479	1% of Total Capital Costs
Insurance	\$148,479	1% of Total Capital Costs
Miscellaneous Painting	\$10,000	Vendor Neutral Estimate
Miscellaneous Equipment Rebuild	\$30,000	Vendor Neutral Estimate
Annualized Total Direct Capital	\$2,943,082	0.1627 Capital Recovery Factor of 10% over 10 years multiplied by sum of TDACC
<b>Total Indirect Annual Costs (TIAC)</b>	<b>\$3,546,836</b>	
<b>Total Annualized Costs</b>	<b>\$4,698,838</b>	Sum of TDAC, TEC and TIAC (for 260 ppm)
<b>Cost Effectiveness of SCR System</b>	<b>\$15,611</b>	Cost Per Ton NOx Removed 301 Tons NOx Removed (260 ppm inlet; 100 ppm outlet; 62% Removal)

Note: 'Included' denotes item is assumed to be included in vendor budgetary estimate for SCR Associated Equipment and Installation. [See letter from Dennis Malone (Babcock Borsig Power) to Michael Hober (RTP Environmental) dated October 19, 2001]

The above cost does not include revenue lost due to system shutdown. Based on a cost of \$56 per ton of waste at 600 tons of waste per day and over an annual shutdown of 10 days, this cost is estimated to be approximately \$336,000 due to lost tipping fees. In addition to this, the amount of revenue lost due to not producing steam during these 10 days is estimated to be approximately \$177,000; bringing the Total Annualized costs to \$5,211,838. Factoring these items into the Total Annualized Costs above, the cost effectiveness of the SCR system is estimated to be \$17,315 per ton of NOx removed.

## Appropriate Permit Limits for Proposed Lee County Energy Recovery Facility December 13, 2001

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At the request of the FDEP, the Lee County project team has reviewed the current plant operational data as well as test data from other facilities. The purpose of this effort is to determine appropriate permit limits for the proposed new unit for the Lee County Energy Recovery Facility. The starting point for the permit limits begins with the 1995 New Source Performance Standards. USEPA based the performance limits in the NSPS on the most recent available data. This included 12 units with spray dry absorbers, fabric filters and selective non-catalytic reduction systems operating in 1994, as well as earlier data. Overall, EPA used performance test data from over 60 municipal waste combustor plants (60 FR 65391, 19 December 1995 and 60 FR 65396, 19 December 1995). As required by Congress, the NSPS "MACT Floor" is set at the level achieved by the best performing plant. Although EPA did not include European test data, they did indicate that the European data would not have changed the limits (59 FR 48254, 20 September 1994, Section VII - *Comparison of the Proposal and European Emission Limits*).

Due to the United States Supreme Court "Carbone" ruling, decided May 16, 1995, (1994 WL 183594 (U.S.N.Y.)); little development of new MWCs has occurred in the United States. Hence, the conclusion reached by USEPA at that time should still be valid. There has been some additional experience gained in the operation of facilities equipped with modern pollution control trains including spray dry absorbers, fabric filters, selective non-catalytic reduction systems and activated carbon injection systems. Enhanced combustion controls have also improved overall municipal waste combustor performance (good combustion practice). The only potential modifications to these designs for a new facility could be the use of a selective catalytic reduction system for NO<sub>x</sub> control. These systems began being applied to municipal waste combustors in Europe and Asia in the early 90's and were reviewed by USEPA in setting the NSPS. They will be reviewed further, based on current costs, in the BACT review for this project.

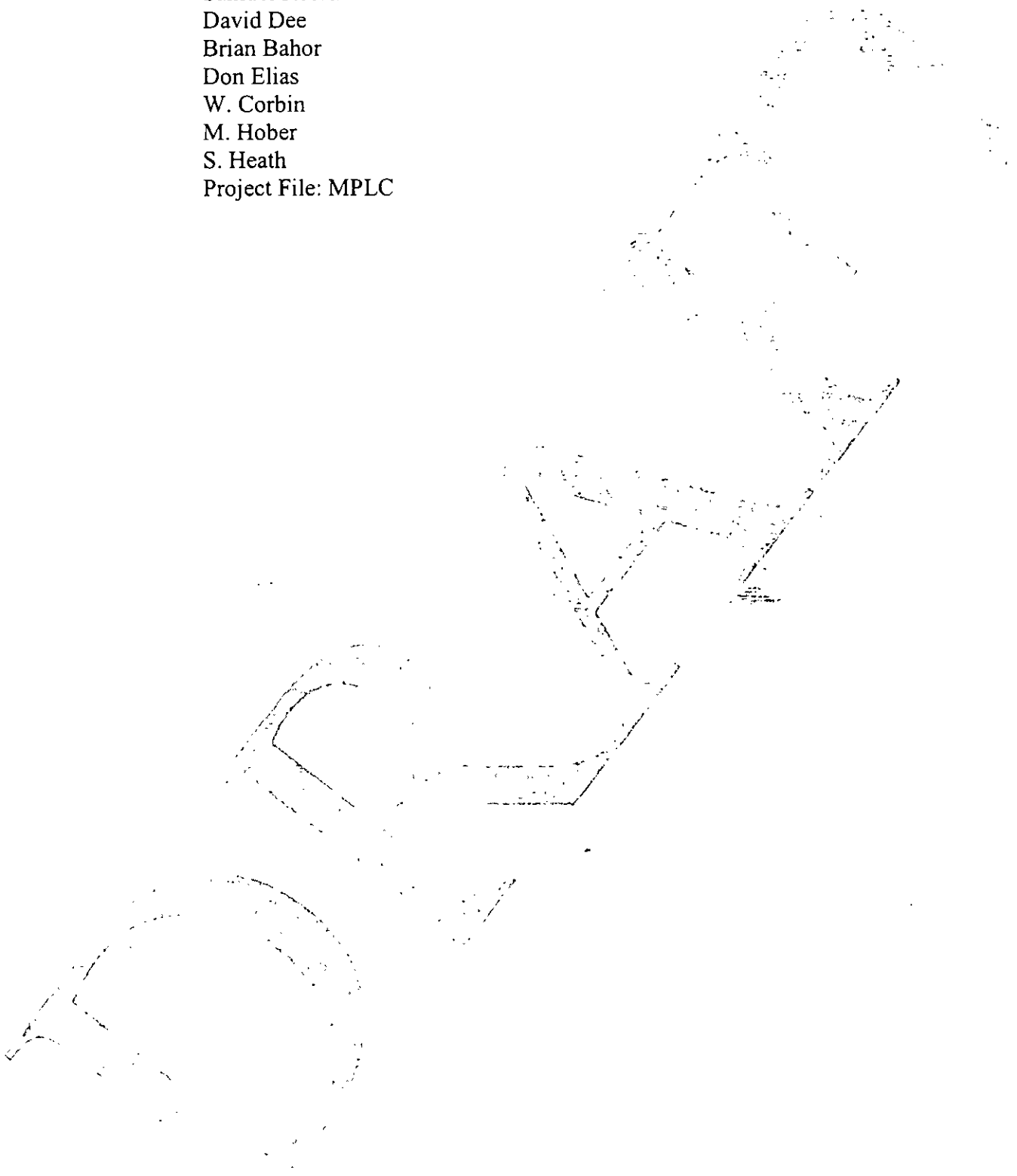
Therefore, based on the BACT considerations, this facility will be designed and operated in accordance with the NSPS standards. Regardless of the permit limits, there will be no change in the design or operation of the proposed facility. The operation of the combustor, as well as the pollution control train, is continuously monitored and strictly regulated. The steam load is tied to the most recent dioxin stack tests. It cannot exceed more than 110% of the last approved stack test. This effectively limits the load to the combustor. Additionally, the inlet temperature to the bag house is monitored to ensure that condensed metals are collected on the particulate in the bag house. This is also tied to the last approved dioxin stack tests and cannot exceed 25 degrees. In addition, there are inlet/outlet monitors for SO<sub>2</sub>, which monitors the performance of the acid gas control equipment. SO<sub>2</sub> is one of the more difficult acid gas species to remove and control of SO<sub>2</sub> to the NSPS limits ensures sufficient control of HF and HCl. The combustion related conditions are monitored continuously through CO and NO<sub>x</sub> continuous emission monitors to ensure proper combustion control. There are also opacity and pressure drop monitors that ensure proper performance of the bag house. These continuous air pollution monitors are also supplemented by process monitors used by control room personnel to ensure the proper operation of the facility. There is also a monitoring requirement for the carbon feed rate to ensure adequate control for mercury and other

volatile metals. The pollution monitors are verified by quarterly performance specification tests. Those regulated pollutants not monitored by continuous emission monitors are typically subject to periodic stack tests. The effect of the overall design, control, and monitoring systems ensures that the operation of the plant is subject to continuous agency oversight and hence fully protective of the public. Regardless of the limit set in the permits, there will be no difference in the design or operation of the facility. Overly stringent permit limits merely increase the risk of spurious "exceedences" of an over-restrictive standard.

It should also be noted that the metals emissions are not guaranteed by the vendor and are the responsibility of the County. The County has maintained an aggressive materials separation/recycling program as outlined in the Materials Separation Plan for this project. There is a limited ability to predict what the variability of the waste stream will be over the life of the facility and life of the permit. The permit limits must be set to accommodate the full range of variability that will occur in the waste stream over this time. In order to provide reasonable assurance that a lower limit could be met for the NSPS metals (cadmium, lead, mercury) additional control equipment would be required, likely including a wet ESP. Costs for such additional control would be prohibitive, both on a cost per ton removed and the effect it would have on the tipping fee for the facility.

Due to the limited amount of test data available for the stack test pollutants (21 data points), there is some difficulty in determining what, if any, reductions can be achieved in practice to allow lower permit emission limits than the NSPS. Since the permit limits are deterministic, pass/fail limits that can never be exceeded, it is appropriate that they accommodate the full range of normal operation. Therefore, historical operating data supports the use of the NSPS limits as aggressive, appropriate permit limits.

cc: Joe Treshler  
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Samuel Rosania  
David Dee  
Brian Bahor  
Don Elias  
W. Corbin  
M. Hober  
S. Heath  
Project File: MPLC



## Incinerator Emission Guidelines (EG) and New Source Performance Standards (NSPS)

Emission Limits @ 7% O <sub>2</sub>	Large MWCs (≥250tpd)		Small MWCs (≥35tpd)		HMIWI <sup>a</sup>		CISWI <sup>a</sup>
	EG	NSPS	EG	NSPS	EG Large/Medium/Small <sup>c</sup>	NSPS Large & Medium /Small <sup>c</sup>	
40 CFR 60 Subpart for EG/NSPS Constructed before/after	Cb 9/20/94	Ea 12/20/89	Eb 9/20/94	BBB (FR12/6/00) 8/30/99	BBB (FR12/6/00) 8/30/99	Ce 6/20/96	DDDD and CCCC (FR12/1/00)
Particulate Matter (mg/dscm) [gr/dscf]	27 [0.012]	34 [0.015]	24 [-0.01]	70 [-0.03]	24 [-0.01]	34/69/115 [0.15/0.03/0.05]	70 [-0.03]
Opacity (percent, 6-minute)	10%	10%	10%	10%	10%	10%	10%
Sulfur Dioxide (ppmdv/%control)	29/75% 24-hr geom	30/80% 24-hr geom	30/80% 24-hr geom	77/50% 24-hr geom	30/80% 24-hr geom	55 <sup>g</sup>	20
HCl (ppmdv/%control)	29/95%	25/95%	25/95%	250/50%	25/95%	100/93%	62
Nitrogen Oxides (ppmdv) for mass burn waterwall	205 24-hr arith	180 24-hr arith	150 <sup>f</sup> 24-hr arith	500 <sup>g</sup>	I=150 <sup>f</sup> 24hr II=500 <sup>g</sup>	250 <sup>g</sup>	388
Carbon Monoxide (ppmdv) for mass burn waterwall	100 4-hr arith	100 4-hr arith	100 4-hr arith	100 4-hr arith	100 4-hr arith	40	157
Cadmium (mg/dscm)	0.040	PM limit used as surrogate	0.020	0.10	0.020	0.16/65%	0.004
Lead (mg/dscm)	0.44		0.20	1.6	0.20	1.2/70%	0.04
Mercury (mg/dscm/%control)	0.080/85%	0.080/85%	0.080/85%	0.080/85%	0.080/85%	0.55/85%	0.47
Dioxins/Furans (ng/dscm)	30 Total (60 ESP)	30 Total	13 Total <sup>h</sup>	125 Total	13 Total	125 Total 2.3 TEQ	0.41 TEQ

<sup>a</sup>Annual stack tests for PM, opacity, HCl (and CO for HMIWI [Hospital/Medical/Infectious Waste Incinerators]) and initial stack test only for Cd, Pb, Hg, PCDD/F (and CO, SO<sub>2</sub>, NO<sub>x</sub> for CISWI [Commercial and Industrial Solid Waste Incineration units]).

<sup>b</sup>Class I units are located at plants with aggregate capacity >250 tpd while Class II units are located at plants with aggregate capacity ≤250tpd.

<sup>c</sup>Small, medium, and large HMIWIs have maximum charge rates ≤200lbs/hour, >200 lbs/hour but ≤500lbs/hour, and >500 lbs/hr, respectively, for continuous or intermittent operation (batch units have daily limits based on these values at 8 hrs/day). EGs for small rural HMIWI not shown here.

<sup>d</sup>Or modification or reconstruction commenced after 6/6/2001.

<sup>e</sup>Or modification or reconstruction commenced after 3/16/1998.

<sup>f</sup>180 ppmdv for first year of operation.

<sup>g</sup>No monitoring, testing, recordkeeping or reporting is required to demonstrate compliance with the EG/NSPS NO<sub>x</sub> limits for Class II small MWC units or the EG/NSPS NO<sub>x</sub> or SO<sub>2</sub> limits for all HMIWI units (compliance is assumed).

<sup>h</sup>30 ng/dscm for first 3 years for facilities for which construction, modification or reconstruction commences on or before 11/20/97.

# Environmental Citizen Award

*awarded to*

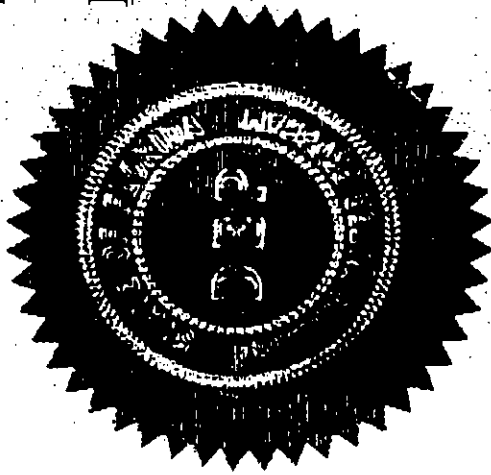
**Ogden Martin Systems of Lee, Inc. Lee County**

**Solid Waste Resource Recovery Facility**

Awarded for continuing dedication to improving air quality while reducing our municipal solid waste and our dependence on fossil fuels for the production of electricity.

*presented by*

**Department of Environmental Protection,  
South District  
September 12, 1996**



*Peter Ware, District Director*



## AGENDA

Lake County Resource Recovery Facility  
Gregg Enterprises, Inc.

December 10, 2001

**I. Introduction**

- A. Project Team
- B. Project Description

**II. Regulatory Requirements**

- A. New Source Performance Standards (NSPS)
- B. Prevention of Significant Deterioration (PSD)

~~**III. Power Plant Siting Act**~~

- A. Supplemental Application
- B. Added Analyses
  - 1. Nitrogen Deposition in Outstanding Florida Waters
  - 2. Mercury
  - 3. Dioxin
- C. PSC Review – Power Purchase Agreement
- D. 403.7061, F.S. Review

**IV. New Source Performance Standards**

- A. Material Separation Plan
- B. Siting Study 60.58 b (PSD application) → who is EPA's contact

**V. Prevention of Significant Deterioration**

- A. Existing Air Quality ↔
- B. PSD Regulated Emissions
- C. Best Available Control Technology (BACT)
  - 1. NO<sub>x</sub>
- D. Impact Assessment
  - 1. ISC/AERMOD ↔
  - 2. Air Quality Related Values (AQRV) Debbie Gelbreith
    - a. Visibility
    - b. CALPUFF

E. Environmental Justice ↔

F. Pre-construction/Post-construction Monitoring ↔ Post + Pre construction monitoring:

**VI. Procedures**

- A. Gregg Enterprises Contacts ↔ Late Spring, early summer.
- B. USEPA Contacts \*
- C. Other Agencies – Federal and State
- D. Time Schedule

## AGENDA

### Lee County Resource Recovery Facility

July 25, 2001

#### I. Introduction

- A. Project Team
- B. Project Description

#### II. Regulatory Requirements

- A. Power Plant Siting Act (PPSA)
- B. New Source Performance Standards (NSPS)
- C. Prevention of Significant Deterioration (PSD)

#### III. Power Plant Siting Act

- A. Supplemental Application
- B. Added Analyses
  - 1. Nitrogen Deposition in Outstanding Florida Waters
  - 2. Mercury
  - 3. Dioxin
- C. PSC Review – Power Purchase Agreement
- D. 403.7061, F.S. Review

#### IV. New Source Performance Standards

- A. Material Separation Plan
- B. Siting Study

#### V. Prevention of Significant Deterioration

- A. Existing Air Quality
- B. PSD Regulated Emissions
- C. Best Available Control Technology (BACT)
  - 1. NOx
- D. Impact Assessment
  - 1. ISC/AERMOD
  - 2. Air Quality Related Values (AQRV)
    - a. Visibility
- E. Environmental Justice
- F. Pre-construction /Post-construction Monitoring

#### VI. Procedures

- A. Lee County Contacts
- B. FDEP Contacts
- C. Other Agencies – Federal and State
- D. Time Schedule

NOTICE OF PUBLIC MEETING CONCERNING LEE COUNTY'S  
PRELIMINARY DRAFT MATERIALS SEPARATION PLAN

The Board of County Commissioners and the Solid Waste Division of Lee County, Florida, hereby give notice that a public meeting will be held at 7:00 p.m. on September --, 2001, to present and review Lee County's Preliminary Draft Materials Separation Plan (Plan). This Plan is being prepared in accordance with the requirements in 40 Code of Federal Regulations, section 60.57b, as part of the County's efforts to obtain the environmental permits and approvals for the expansion of the Lee County Energy Recovery Facility. Lee County will accept written and oral comments about the Plan during the public meeting, which will be held at the Lee County Energy Recovery Facility, 10500 Buckingham Road, Ft. Myers, Florida.

Agenda for the Public Meeting

- A. Introduction
- B. The proposed expansion of Lee County's Energy Recovery Facility
- C. The size of the area served by Lee County's Energy Recovery Facility
- D. The amount of solid waste generated in Lee County's service area
- E. The types and estimated amounts of materials proposed for separation
- F. The methods proposed for materials separation
- G. The amount of residual waste for disposal
- H. Alternate disposal methods for handling the residual waste
- I. Public questions and comments.

In addition to submitting comments at the public meeting, the public may submit written comments about the Plan to the Solid Waste Division of Lee County at 1500 Monroe St., Ft. Myers, Fl. 33901. Comments will be accepted from the date of this notice until September --, 2001.

The Preliminary Draft Materials Separation Plan is available for inspection at the following locations:

Solid Waste Division of  
Lee County  
1500 Monroe St.  
Fort Myers, FL.

M-F 9:00 AM to 5:00 PM

Ft. Myers Central Library  
2050 Central Avenue  
Fort Myers, FL 33901

M-Th 9:00 AM to 9:00 PM  
F&S 9:00 AM to 6:00 PM

Cape Coral Library  
921 SW 39th Terrace  
Cape Coral, FL 33914

M-F 9:00 AM to 9:00 PM  
SAT 9:00 AM to 6:00 PM

East County Regional Library  
881 Gunnery Road  
Lehigh Acres, FL 33971

M-Th 9:00 AM to 9:00 PM  
F&S 9:00 AM to 6:00 PM

South County Regional Library  
21100 Three Oaks Parkway  
Estero, FL 33928

M-Th 9:00 AM to 9:00 PM  
F&S 9:00 AM to 6:00 PM

If the County receives timely comments about the Plan, the County will prepare responses to those comments. The County also will prepare a Final Draft Materials Separation Plan. The County's responses to public comments, and the County's Final Draft Materials Separation Plan, will be available for inspection at the same locations that are listed above for the inspection of the Preliminary Draft Materials Separation Plan.

GLADES COUNTY

HENDRY COUNTY

COLLIER COUNTY

LEE COUNTY

COUNTY

LEE COUNTY

CHARLOTTE

Charlotte Harbor

**PROJECT LOCATION**

31

75

80

82

Charlotte River

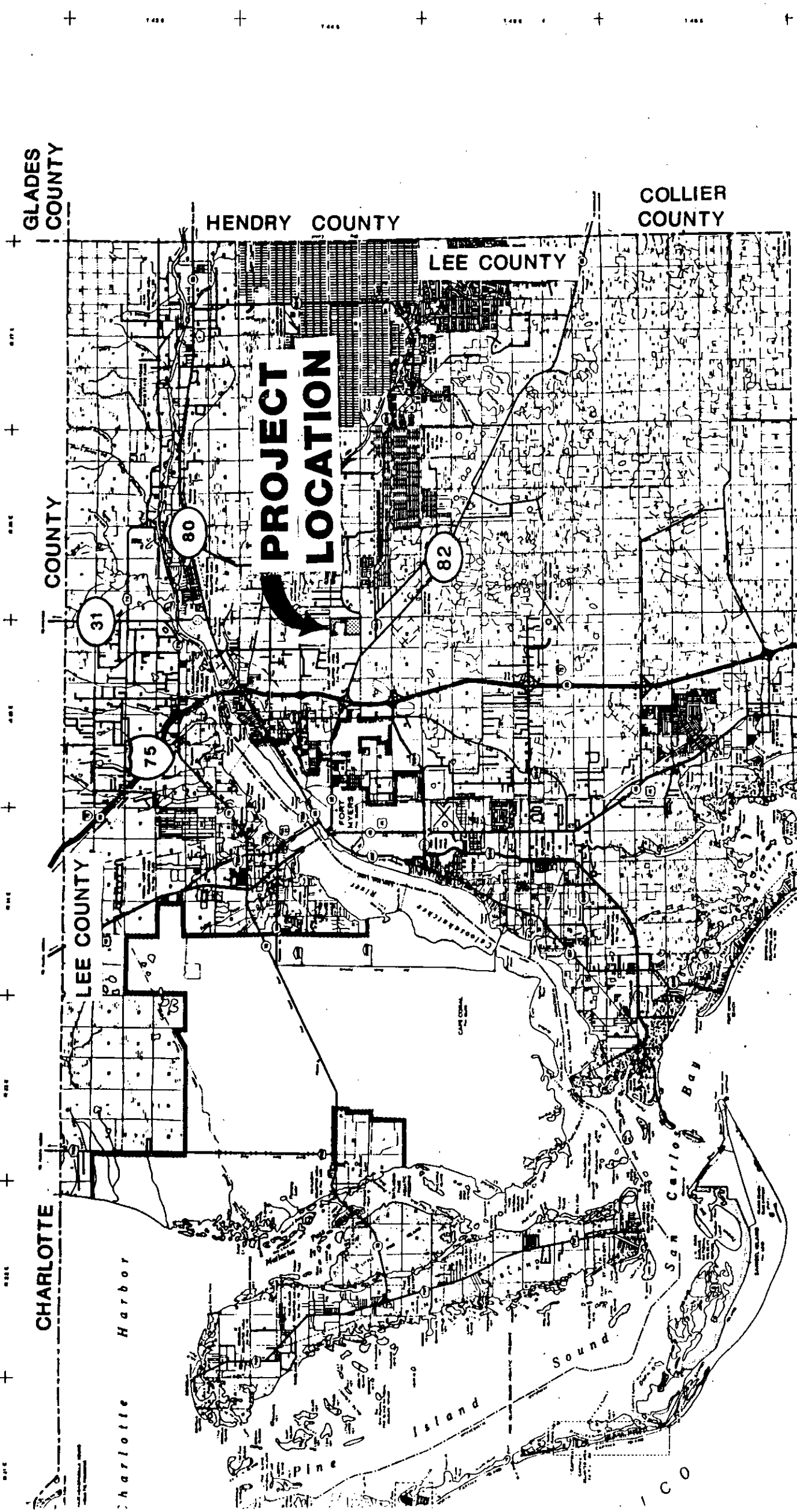
San Carlos Bay

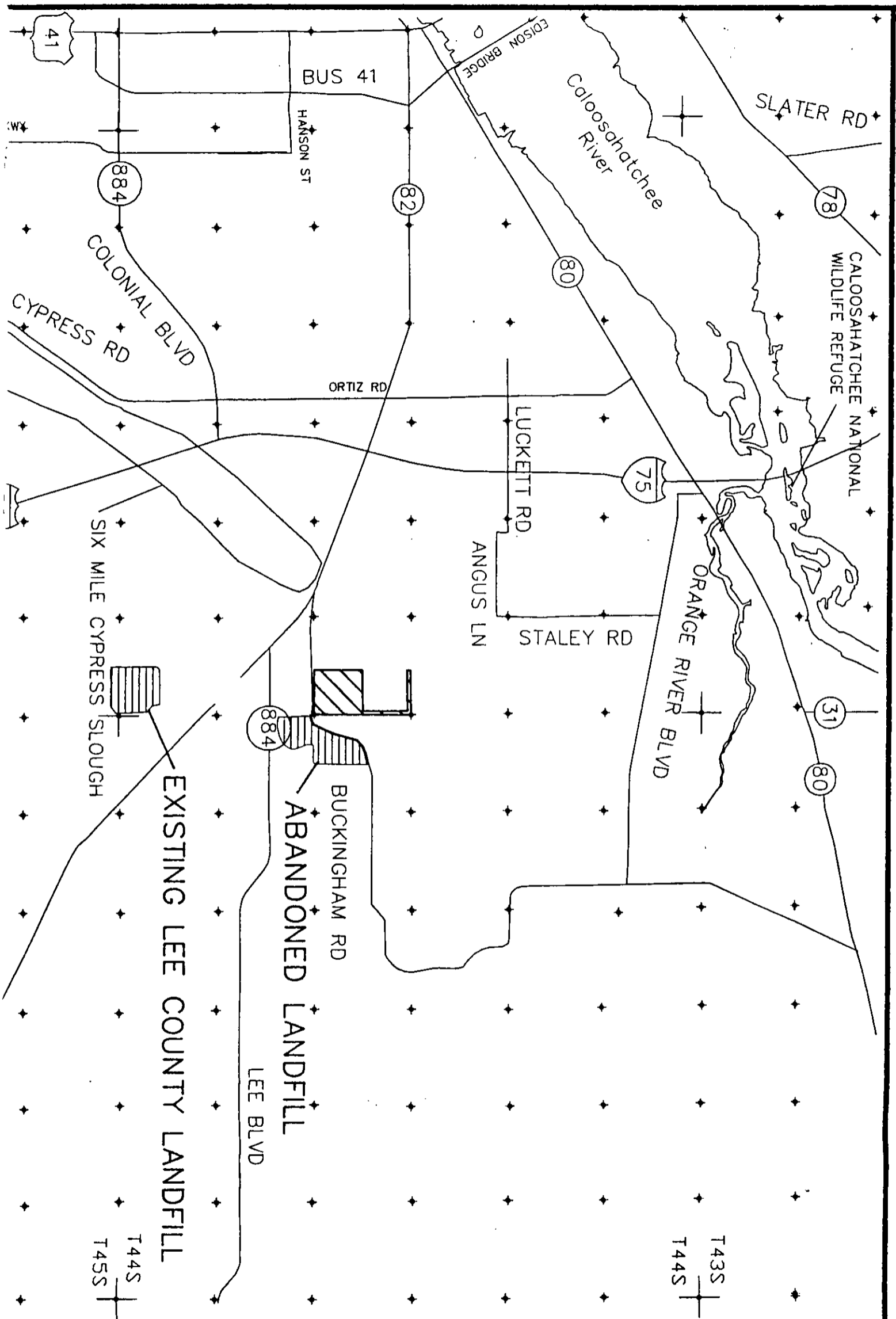
Sound

Island

Pine

1 C 0





LEGI

EXISTING LEE COUNTY LANDFILL

ABANDONED LANDFILL

T44S  
T45S

T43S  
T44S