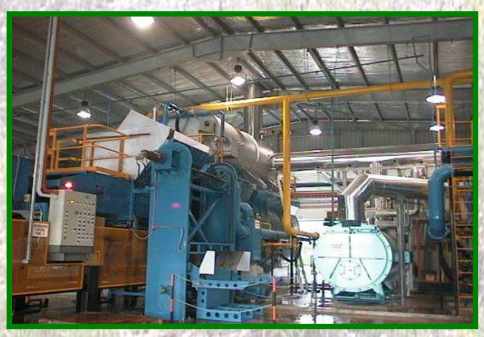

Los Angeles County Conversion Technology Evaluation Report

~

Phase II

Appendices

Converting Waste into Renewable Resources

October 2007

APPENDIX A

SUPPORTING DOCUMENTATION FOR SELECTION OF PARTICIPATING TECHNOLOGY SUPPLIERS

Alternative Resources, Inc.

Corporate Headquarters

1732 Main Street
Concord, MA 01742
Tel (978) 371-2054
Fax (978) 371-7269

www.alt-res.com

Representative letter sent to the six technology suppliers recommended in the Phase I Study.

August 10, 2006
1630-1

Mr. Francis C. Campbell, President
Interstate Waste Technologies, Inc.
17 Mystic Lane
Malvern, PA 19355

via email: Frankc@iwtonline.com

Subject: Southern California Conversion Technology Demonstration Facility

Dear Mr. Campbell:

The Los Angeles County Department of Public Works and the Alternative Technology Advisory Subcommittee (Subcommittee) of the Los Angeles County Solid Waste Management Committee/Integrated Waste Management Task Force, is continuing its efforts to facilitate development of a conversion technology demonstration facility in Southern California. The County has initiated Phase II activities, and has engaged Alternative Resources, Inc. (ARI) to assist in the process. As Phase II efforts begin, the County's focus remains on co-locating a conversion technology at a Material Recovery Facility / Transfer Station (MRF/TS) for the purpose of processing MRF residue and increasing diversion from landfill disposal.

In Phase I of the project, information was gathered on numerous conversion technologies. Individual technology suppliers were screened and ranked, based on information provided in response to a standardized questionnaire. Phase II of the project will consist of an independent verification of the qualifications of selected technology suppliers to determine if each supplier can meet key requirements, and an independent verification of the performance of the technologies. An objective of Phase II is to rank conversion technology suppliers as well as MRF/TS sites that have been identified as possible host locations. Technology suppliers will be selected to participate in Phase II based on: (1) the results of the Phase I evaluation and ranking; (2) consideration of new and relevant information regarding technology performance and development, including ancillary capabilities of technology suppliers (e.g., integrating combined heat and power or alternative fuels in project development activities), and (3) the ability and willingness of the technology supplier to participate in Phase II, including the ability and willingness to create a partnership with one of the MRF sites under review.

Interstate Waste Technologies was ranked as one of the top four thermal technology suppliers in the Phase I study, and was recommended for further evaluation in Phase II. The purpose of this letter is to confirm IWT's willingness and ability to participate in Phase II of the project. Phase II will be conducted over the next six months, and will require the following minimum commitments by participating technology suppliers over this discrete period of time: (1) written response to a comprehensive Request for Information (RFI), which will require disclosure of technical, environmental, and cost information for the technology as well as corporate qualifications (including technology supplier's partners and strategic alliances, if any) to construct and operate a facility; (2) presentation to the Subcommittee and others involved in Phase II activities to promote a consistent understanding of corporate qualifications and technology capabilities; and (3) tour of a reference facility, to enable observation of the technology in operation.

We are requesting that you reply in writing to this letter on or before August 18, 2006, to confirm your ability and willingness to participate in the Phase II process. In your response, please address each of the following:

- Provide written confirmation of your willingness and ability to provide technical, environmental, and cost information for the technology as well as core corporate and extended team qualifications to construct and operate a facility.

- Provide written confirmation of your willingness and ability to create a partnership with one or more MRF/TS owner/operators for development of a demonstration facility to process post-recycled MRF residuals.

- Identify the operating reference facility for your technology that will be available to tour, including information on: the location of the facility; the operational status of the facility (i.e., commercial facility in continuous operation, demonstration facility operated for discrete pilot testing, etc.); the capacity and type of waste processed at the reference facility, and the name(s) of the owner and operator.

- Provide written confirmation of your ability to work within the established, six-month schedule, for purpose of submitting detailed information, presenting to the Subcommittee, and conducting a tour of a reference facility. The most time-sensitive requirement will be responding to the RFI. The RFI is expected to be issued in late August or early September, and will require a completed response within a three- to four-week period.

- Identify any new information or technology developments that the Subcommittee should be aware of (i.e., subsequent to the information provided for Phase I), which would be relevant to the Phase II review and evaluation process (e.g., new performance data, additional economic analyses, project teaming arrangements, etc.).

Responses should be sent directly to ARI, with a copy to the County of Los Angeles Department of Public Works. Contact information is as follows:

Alternative Resources, Inc.
Attn: Susan Higgins, P.E., Project Engineer
1732 Main Street
Concord, MA 01742-3837
Email: shiggins@alt-res.com
Tel: (978) 371-2054
Fax: (978) 371-7269

County of Los Angeles Department of Public Works
Attn: Coby J. Skye, P.E., Associate Civil Engineer
Environmental Programs Division
900 South Fremont Avenue
Annex 3rd Floor
Alhambra, CA 91803-1331
Email: cskye@ladpw.org

You are encouraged to send your response electronically, but we also require submittal of a hard copy for documentation purposes. Based on the responses received, the Subcommittee will select the technology suppliers for participation in Phase II. As a first point of contact, you can call me at 978-371-2054 if you have any questions.

Very truly yours,

Susan M. Higgins

Susan M. Higgins
Project Engineer

cc: C. Skye, LADPW

Alternative Resources, Inc.

Corporate Headquarters

1732 Main Street
Concord, MA 01742
Tel (978) 371-2054
Fax (978) 371-7269

www.alt-res.com

Representative letter sent to the eight technology suppliers evaluated in the Phase I Study but not recommended at that time.

August 10, 2006
1630-1

Mr. Steven A. Morris, President
Waste Recovery Systems, Inc.
33655 Marlinspike Drive
Monarch Beach, CA 92629-4428

via email: samwrsi@cox.net

Subject: Southern California Conversion Technology Demonstration Facility

Dear Mr. Morris:

The Los Angeles County Department of Public Works and the Alternative Technology Advisory Subcommittee (Subcommittee) of the Los Angeles County Solid Waste Management Committee/Integrated Waste Management Task Force, is continuing its efforts to facilitate development of a conversion technology demonstration facility in Southern California. The County has initiated Phase II activities, and has engaged Alternative Resources, Inc. (ARI) to assist in the process. As Phase II efforts begin, the County's focus remains on co-locating a conversion technology at a Material Recovery Facility /Transfer Station (MRF/TS) for the purpose of processing MRF residue and increasing diversion from landfill disposal.

In Phase I of the project, information was gathered on numerous conversion technologies. Individual technology suppliers were screened and ranked, based on information provided in response to a standardized questionnaire. Phase II of the project will consist of an independent verification of the qualifications of selected technology suppliers to determine if each supplier can meet key requirements, and an independent verification of the performance of the technologies. An objective of Phase II is to rank conversion technology suppliers as well as MRF/TS sites that have been identified as possible host locations.

The Phase I study recommended six technology suppliers for further consideration in Phase II. While your company was not one of those six, the Subcommittee has not yet made its final determination of the technology suppliers that will be selected as Phase II participants. Technology suppliers will be selected based on: (1) the results of the Phase I evaluation and ranking; (2) consideration of new and relevant information regarding technology performance and development, including ancillary capabilities of technology suppliers (e.g., integrating combined heat and power or alternative fuels in project development activities), and (3) the ability and willingness of the technology supplier to participate in Phase II, including the ability and willingness to create a partnership with one of the MRF/TS sites under review.

The purpose of this letter is to determine your interest in the Phase II process, and to provide you the opportunity to disclose new and relevant information regarding technology performance and development for consideration by the Subcommittee as it makes a determination of the selected

technology suppliers. Selected technology suppliers must demonstrate a willingness and ability to participate in Phase II of the project. Phase II will be conducted over the next six months, and will require the following minimum commitments by participating technology suppliers over this discrete period of time: (1) written response to a comprehensive request for information, which will require disclosure of technical, environmental, and cost information for the technology as well as corporate qualifications (including technology supplier's partners and strategic alliances, if any) to construct and operate a facility; (2) presentation to the Subcommittee and others involved in Phase II activities to promote a consistent understanding of corporate qualifications and technology capabilities; and (3) tour of a reference facility, to enable observation of the technology in operation.

If you remain interested in further consideration by the Subcommittee, we request that you reply in writing to this letter on or before August 18, 2006, to express your ability and willingness to participate in the Phase II process. In your response, please address each of the following:

- Provide written confirmation of your willingness and ability to provide technical, environmental, and cost information for the technology as well as core corporate and extended team qualifications to construct and operate a facility.

- Provide written confirmation of your willingness and ability to create a partnership with one or more MRF/TS owner/operators for development of a demonstration facility to process post-recycled MRF residuals.

- Identify the operating reference facility for your technology that will be available to tour, including information on: the location of the facility; the operational status of the facility (i.e., commercial facility in continuous operation, demonstration facility operated for discrete pilot testing, etc.); the capacity and type of waste processed at the reference facility, and the name(s) of the owner and operator.

- Provide written confirmation of your ability to work within the established, six-month schedule, for purpose of submitting detailed information, presenting to the Subcommittee, and conducting a tour of a reference facility. The most time-sensitive requirement will be responding to the RFI. The RFI is expected to be issued in late August or early September, and will require a completed response within a three- to four-week period.

- Identify any new information or technology developments that the Subcommittee should be aware of (i.e., subsequent to the information provided for Phase I), which would be relevant to the Phase II review and evaluation process (e.g., new performance data, additional economic analyses, project teaming arrangements, etc.).

- Findings of the Phase I study included not recommending anaerobic digestion as a preferred technology for processing MRF residue for a variety of reasons, including: potential unsuitability of MRF residue as a feedstock; extensive preprocessing requirements; larger footprint; larger percentage of residue; generation of mostly compost and less electricity, with marketability of the compost uncertain; and, pre-existing development activities for a commercial anaerobic digestion facility in Southern California. In considering new information or technology developments that you wish to disclose, we request that you consider these specific reasons for not recommending anaerobic digestion as a preferred technology, and describe how you would overcome these issues.

Responses should be sent directly to ARI, with a copy to the County of Los Angeles Department of Public Works. Contact information is as follows:

Alternative Resources, Inc.
Attn: Susan Higgins, P.E., Project Engineer
1732 Main Street
Concord, MA 01742-3837
Email: shiggins@alt-res.com
Tel: (978) 371-2054
Fax: (978) 371-7269

County of Los Angeles Department of Public Works
Attn: Coby J. Skye, P.E., Associate Civil Engineer
Environmental Programs Division
900 South Fremont Avenue
Annex 3rd Floor
Alhambra, CA 91803-1331
Email: cskye@ladpw.org

You are encouraged to send your response electronically, but we also require submittal of a hard copy for documentation purposes. Based on the responses received, the Subcommittee will select the technology suppliers for participation in Phase II. As a first point of contact, you can call me at 978-371-2054 if you have any questions.

Very truly yours,

Susan M. Higgins

Susan M. Higgins
Project Engineer

cc: C. Skye, LADPW

Alternative Resources, Inc.

Corporate Headquarters

1732 Main Street
Concord, MA 01742
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Fax (978) 371-7269

www.alt-res.com

September 13, 2006
1630-1

Representative letter and questionnaire sent to the 18 "new" technology suppliers not evaluated in the Phase I Study.

Ms. Necy Sumait
Arkenol, Inc.
31 Musick
Irvine, CA 92618

Via email: nsumait@bluefireethanol.com

Subject: Southern California Conversion Technology Demonstration Facility

Dear Ms. Sumait:

The Los Angeles County Department of Public Works and the Alternative Technology Advisory Subcommittee (Subcommittee) of the Los Angeles County Solid Waste Management Committee/Integrated Waste Management Task Force, is continuing its efforts to facilitate development of a conversion technology demonstration facility in Southern California. The County has initiated Phase II activities, and has engaged Alternative Resources, Inc. (ARI) to assist in the process. As Phase II efforts begin, the County's focus remains on co-locating a conversion technology at a Material Recovery Facility/Transfer Station (MRF/TS) for the purpose of processing MRF residuals (i.e., the material remaining after recovery of recyclable materials) and increasing diversion from landfill disposal.

In Phase I of the project, information was gathered on numerous conversion technologies. Individual technology suppliers were screened and ranked, based on information provided in response to a standardized questionnaire. Phase II of the project will consist of an independent verification of the qualifications of selected technology suppliers to determine if each supplier can meet key requirements, and an independent verification of the performance of the technologies. An objective of Phase II is to rank conversion technology suppliers as well as MRF/TS sites that have been identified as possible host locations.

The Subcommittee is in the process of selecting technology suppliers for participation in Phase II of the conversion technology demonstration project. Technology suppliers will be selected based on: (1) the results of the Phase I evaluation and ranking; (2) consideration of new and relevant information regarding technology performance and development, including ancillary capabilities of technology suppliers (e.g., integrating combined heat and power or alternative fuels in project development activities); (3) the capabilities of "new" technology suppliers that were not evaluated in the Phase I Study and that meet minimum evaluation criteria identified herein, and (4) the ability and willingness of technology suppliers to participate in Phase II, including the ability and willingness to provide detailed information to the County and to create a partnership with one of the MRF/TS sites under review.

You are receiving this letter, because you were not a participant in the Phase I Study but have contacted the County expressing interest in their conversion technology project. The purpose of this letter is to determine your interest in the Phase II process, and to provide you the opportunity to complete a questionnaire for consideration by the Subcommittee as it makes a determination of the selected technology suppliers. As a "new" technology supplier, you must confirm a willingness and ability to participate in Phase II of the project with a timely response, and you must demonstrate technology experience and capabilities comparable to the top-ranked technology suppliers from the Phase I process by meeting the following minimum criteria:

A. Technology supplier must be able to offer a complete system to process MRF residue and post-recycled MSW, including pre-processing (as necessary), conversion, and product processing (e.g., electricity generation).

B. The technology must have been demonstrated at a pilot-, demonstration- or commercial-scale at 5 tpd or greater, for at least one year, and during any one-year period processed at least 1,000 tons of MRF residuals, MSW, RDF or similar feedstock. (Note: sewage sludge, black liquor solids, chemicals, plastics or tires are not considered "similar feedstock".)

C. Technology supplier must have an operating reference facility that can be toured by the County in the next six months to observe the technology in operation.

D. Technology must be able to convert post-recycled MSW and MRF residuals to products that have existing, strong markets. Technologies that generate only RDF or only compost will not be considered.

E. If applicable, the technology must have the capability for collection and cleaning of the synthesis gas generated by the conversion process prior to its use for the generation of electricity.

F. The technology must have the potential to achieve 75% or greater landfill diversion (by weight) when processing post-recycled MSW or MRF residuals.

Phase II will be conducted over the next six months, and will require the following minimum commitments by participating technology suppliers over this discrete period of time: (1) written response to a comprehensive request for information, which will require disclosure of technical, environmental, and cost information for the technology as well as corporate qualifications (including technology supplier's partners and strategic alliances, if any) to construct and operate a facility; (2) presentation to the Subcommittee and others involved in Phase II activities to promote a consistent understanding of corporate qualifications and technology capabilities; and (3) tour of an operating reference facility, to enable observation of the technology in operation.

If you are interested in consideration by the Subcommittee, you must fully complete and submit the attached questionnaire no later than Monday, September 18, 2006. We recognize this is a short response time, but the questionnaire is brief and requires only yes and no answers and direct responses to basic questions. Supplemental, detailed information is not being requested at this time. The questionnaire is segmented into four parts. Parts I and II request general information on the technology supplier (including teaming partners) and the technology, respectively. Part III requests confirmation of your ability and willingness to participate in the next phase of the project, if selected for participation by the Subcommittee. Part IV establishes minimum criteria that must be met by all "new" technology suppliers for consideration as a participant in Phase II of the County's project.

Responses should be sent directly to ARI, with a copy to the County of Los Angeles Department of Public Works. Contact information is as follows:

Alternative Resources, Inc.
Attn: Susan Higgins, P.E., Project Engineer
1732 Main Street
Concord, MA 01742-3837
Email: shiggins@alt-res.com
Tel: (978) 371-2054
Fax: (978) 371-7269

County of Los Angeles Department of Public Works
Attn: Coby J. Skye, P.E., Associate Civil Engineer
Environmental Programs Division
900 South Fremont Avenue
Annex 3rd Floor
Alhambra, CA 91803-1331
Email: cskye@ladpw.org

You are encouraged to send your response electronically, but we also require submittal of a hard copy for documentation purposes. Based on the responses received, the Subcommittee will select the technology suppliers for participation in Phase II. As a first point of contact, you can call me at 978-371-2054 if you have any questions.

Very truly yours,

Susan M. Higgins
Project Engineer

Attachment

cc: C. Skye, LADPW

Los Angeles County Conversion Technology Demonstration Project - Phase II
Questionnaire for Consideration of New Technology Suppliers
September 13, 2006

If your company would like to be considered as a "new" technology supplier for participation in Phase II of the Los Angeles County conversion technology demonstration project, please complete this questionnaire and submit it no later than **Monday, September 18, 2006**, to Alternative Resources, Inc. (ARI) and to the Los Angeles County Department of Public Works. Submittal by email is encouraged, but should be followed-up with a hard copy. Please contact ARI if you have any questions.

Alternative Resources, Inc. (ARI)
Attn: Susan Higgins, P.E., Project Engineer
1732 Main Street
Concord, MA 01742-3837
Email: shiggins@alt-res.com
Tel: (978) 371-2054
Fax: (978) 371-7269

County of Los Angeles Department of Public Works
Attn: Coby J. Skye, P.E., Associate Civil Engineer
Environmental Programs Division
900 South Fremont Avenue
Annex 3rd Floor
Alhambra, CA 91803-1331
Email: cskye@ladpw.org

I. Technology Supplier Information

A. Technology Supplier Name:

B. Contact Person Name and Title:
Address:

Telephone:
Fax:
Email:

C. Identification of Teaming Partners, including company name and role (e.g., developer, licensee, design and construction or EPC contractor, permitting consultant, financing entity, etc.):

II. Technology Information

A. Name of Technology:

B. Relationship of Technology Supplier to Technology (e.g., licensee, licensor, etc.):

C. Brief Description of Technology (including pre-processing, conversion and product processing systems; attach a schematic and additional information, as appropriate):

III. Confirmation of Technology Supplier's Willingness/Ability to Participate, *if Selected*

A.	Confirm overall willingness and ability to participate in the Phase II process, including: submitting detailed information; meeting with and/or presenting to the Subcommittee; and, conducting a tour of an operating reference facility.	Yes___ No___	Comments (if necessary):
B.	Confirm willingness and ability to provide technical, environmental and cost information for the technology as well as core corporate and extended team qualifications to construct and operate a facility.	Yes___ No___	Comments (if necessary):
C.	Confirm willingness and ability to create a partnership with one or more Material Recovery Facility/Transfer Station owner/operators for development of a demonstration facility to process post-recycled MRF residuals.	Yes___ No___	Comments (if necessary):
D.	Confirm willingness and ability to work within a six-month schedule for providing information, presenting to the Subcommittee, and conducting a tour of an operating reference facility. The most time-sensitive requirement will be responding to a detailed Request for Information, which is expected to be issued early next month, and which will require a complete response within approximately four-weeks.	Yes___ No___	Comments (if necessary):
E.	Confirm ability to conduct a tour of an <u>operating</u> reference facility, and provide information requested below for the facility. Facility Name: Location: Owner: Operator: Commercial Status(1): Operating Schedule(2): Facility Capacity: Unit Capacity/No. of Units: Type of Waste Processed:	Yes___ No___	Comments (if necessary):

(1) Indicate if reference facility is in commercial operation or if it is a pilot or demonstration facility.

(2) If facility is not operated continuously (24/7), indicate typical operating schedule.

IV. Confirmation Technology Supplier meets Minimum Criteria for Phase II Participation

A.	Does the technology supplier offer a complete system to process MRF residue and post-recycled MSW, including pre-processing (as necessary), conversion, and product processing (e.g., electricity generation)?	Yes___ No___
B.	Has the technology been demonstrated at a demonstration-, pilot- or commercial-scale for a unit capacity of 5 tpd or larger, processing MRF residuals, MSW, RDF or similar feedstock, for an operating period of at least one year, and during any one-year period processed at least 1,000 tons of MRF residuals, MSW, RDF or similar feedstock? (Note: sewage sludge, black liquor solids, chemicals, plastics or tires are not considered a "similar feedstock".) Identify at least one facility that meets this criterion: Facility Name: Location: Facility Capacity: Unit Capacity/No. of Units: Dates Operated: Operating Schedule: Type of Waste Processed: Actual (not Design) Annual Throughput of MRF Residuals, MSW, or RDF:	Yes___ No___
C.	Do you have an **operating** reference facility that can be toured by the County in the next six months to observe the technology in operation?	Yes___ No___
D.	Is the technology able to convert post-recycled MSW and MRF residuals to products, *other than only compost or only RDF*, that have existing, strong markets? If Yes, Please List All Primary Marketable Products and/or By-Products:	Yes___ No___
E.	If applicable, does the technology have capability for collection and cleaning of the synthesis gas generated by the conversion process prior to its use for the generation of electricity?	Yes___ No___ Not Applicable___
F.	Does the technology have the potential to achieve 75% or greater landfill diversion (by weight) when processing post-recycled MSW or MRF residuals? Typical Diversion Rate (% by weight of feedstock): Typical Quantity of Residue (% by weight of feedstock):	Yes___ No___

Alternative Resources, Inc.

Corporate Headquarters

1732 Main Street
Concord, MA 01742
Tel (978) 371-2054
Fax (978) 371-7269

MEMORANDUM

TO: **Coby Skye, LA County DPW**

FROM: **Jim Binder, ARI Project Director**
Sue Higgins, ARI Project Manager

DATE: **August 25, 2006**

SUBJECT: **Conversion Technology Demonstration Facility**
Summary of Responses from Technology Suppliers and
Recommendation of Participants for Phase II Evaluation

On August 10, 2006, following a process approved by the Subcommittee on July 31st, ARI sent letters to the fourteen technology suppliers that were previously evaluated by the Subcommittee in the Phase I process to determine if new information has become available that warrants further consideration. This memorandum summarizes responses received by ARI and presents our recommendations regarding participants for the Phase II Evaluation. Table 1, attached, presents an overview of responses.

Responses from the Six Technology Suppliers Recommended in the Phase I Study

The Phase I Study recommended six technology suppliers for further evaluation in Phase II. These six technology suppliers are the four thermal technologies that received the highest ranked scores and the two waste-to-fuel emerging technologies that passed the screening criteria:

- Interstate Waste Technologies
- Primenergy
- Ntech Environmental
- GEM America
- Changing World Technologies
- BRI Energy

The purpose of issuing a letter to these six technology suppliers was to confirm their willingness and ability to participate in Phase II, recognizing the commitment that would be required on their part. All six of these technology suppliers responded in writing to the August 10, 2006, letter, and expressed both an ability and a willingness to participate in Phase II. Similarly, all six confirmed a willingness and ability to partner with the MRF/TS owner/operators, confirmed an ability to work within the six-month schedule, and identified a reference facility suitable for touring.

Responses from the Other Eight Technology Suppliers Evaluated in Phase I

Eight additional technology suppliers passed the screening criteria and were evaluated in Phase I, but at that time were not recommended for further evaluation. A letter was issued to these eight technology suppliers to determine their interest in the Phase II process and to provide the opportunity to disclose new and relevant information regarding technology performance and development. In disclosing new information, the technology suppliers were asked to address factors that impacted their ranking in Phase I as well as specific issues unique to their technologies.

Three of the eight technology suppliers responded via email that they would decline to participate. All three are suppliers of anaerobic digestion technologies: Waste Recovery Systems, Organic Waste Systems, and Canada Composting. One of the eight technology suppliers, Geoplasma, has not yet responded to the August 10th letter. ARI e-mailed Geoplasma on August 10, 17 and 21, and called on August 17 and 22. We spoke to a Geoplasma representative directly on August 17th regarding the letter, but no commitment was made regarding a response. Our other messages to Geoplasma were not returned.

The four technology suppliers from the group of eight that did respond to the August 10th letter are addressed below:

- **Ebara Corporation.** Ebara provided a detailed response, expressing their willingness and ability to participate in Phase II, within the six-month schedule, with their more established, commercially-operational, TwinRec/TIFG (gasification/ash vitrification) technology. Ebara confirmed a willingness and ability to create a partnership with a MRF/TS owner/operator, and identified subsidiaries with existing offices in Santa Clara and Sacramento that could facilitate partnering activities. Ebara identified ten commercial facilities in Japan that use the TwinRec/TIFG technology. The 420-tpd Kawaguchi facility, which has operated since November 2002 and processes MSW, would be suitable for a reference facility.

- **Arrow Ecology.** Arrow provided a detailed response to ARI's letter. Arrow expressed both an ability and a willingness to participate in Phase II, confirmed an ability to work within the six-month schedule, and identified a reference facility suitable for touring (Tel Aviv, Israel). Arrow's reference facility processes mixed, unsorted MSW and MRF residuals. Arrow confirmed a willingness and ability to partner with the MRF/TS owner/operators, and stated that such a partnership is already in an advanced stage of being formed with one of the six MRF/TS sites on LA County's Phase I list. Recent technology developments have been made at Arrow's reference facility, which have resulted in more complete recovery and an improved quality of recyclable plastics. Also, since Arrow's response to Phase I, construction is now underway for a 100,000 ton per year commercial facility near Sydney, Australia, scheduled to be operational in late 2007 or early 2008.

Arrow addressed the specific reasons anaerobic digestion was not selected in Phase I as a preferred technology, and described in detail how their technology is distinguished from other anaerobic digestion technologies. A summary of the key points presented in Arrow's discussion regarding how it overcomes the stated disadvantages of anaerobic digestion, as presented in the Phase I Study, follows:

- **MRF Residue may be Unsuitable Feedstock.** Arrow currently processes both MRF residuals and mixed MSW at its reference facility, which demonstrates that MRF residue and black-bin waste would be a suitable feedstock for their process.

- **Extensive Pre-Processing is Required.** Arrow's up-front separation/ preparation process is more than conventional pre-processing to remove non-biodegradable, inorganic materials. It is integral to the unique, wet digestion process used by Arrow, and serves multiple purposes, including recovery of recyclables as well as preparation of the organic waste for the wet digestion process.

- **Larger Footprint Requirements.** The integration of the separation/ preparation and digestion processes reduces space requirements. The plant under construction in Australia has a footprint of 4 acres for a capacity of 100,000 tons per year. This is consistent with some thermal technologies, when considering comparable throughput and complete site needs. Compared to other anaerobic digestion technologies, footprint requirements for Arrow can be 50% less.

- **Larger Percentage of Residue Requiring Landfill Disposal.** Residue at Arrow's reference plant is reported to be approximately 20% by weight of the mixed MSW inputs, and less when processing MRF residuals. Arrow also responded that if economical, the residue could be reduced to approximately 10% by weight by drying it using waste heat from the generator. Arrow has implemented technology developments that improve plastic recovery and correspondingly reduce residue quantities. Arrow's residue quantity is higher than for thermal and waste-to-fuel technologies, which can range from 1% to 15% assuming all products are marketed, but lower than other anaerobic digestion technologies that use conventional, pre-processing technologies and can have residue quantities of 30% by weight (or more).

- **Generation of Mostly Compost and less Electricity.** Arrow's reference facility exports electricity to the grid at a rate of approximately 280 kWh/ton of MSW processed. This is less than the potential net electrical output of thermal conversion technologies but at least twice as high as other anaerobic digestion technologies. This higher electric output is the result of Arrow's advanced, two-stage digestion process,

which produces a biogas with a higher methane concentration (70-80%, compared to 55%). This process also results in a lesser amount of well-stabilized compost (14-17% by weight, compared to 24-33% for other anaerobic digestion technologies).

- **Marketing of Compost is Questionable.** Data is available on Arrow's compost quality, and compost from the reference facility was used in greenhouse growth tests with results reported to be favorable. Arrow acknowledges that even with high quality, sources of organic material are prevalent in California, which would make marketing of the compost more challenging. Arrow would overcome this by seeking out what they call "boutique" uses, with consideration of use of the compost as a landfill alternate daily cover material as a fallback position.

- **Pre-existing Development Activities in California - No Need for Demonstration Facility.** Arrow responded that such activities are either dormant (i.e., the WRSI/Valorga facility in Riverside County which is reported to be on indefinite hold) or will be of tangential interest (i.e., the pilot research facility at the University of California, Davis, which will focus on source-separated organics and not mixed MSW or MRF-residuals).

- **International Environmental Solutions.** IES provided a detailed response, expressing both an ability and a willingness to participate in Phase II; confirming a willingness and ability to partner with the MRF/TS owner/operators; confirming an ability to work within the six-month schedule, and identifying a reference facility suitable for touring (Romoland, CA). IES has formed strategic alliances, including relationships with Northern Power Systems (for facility design and construction) and Rainbow Disposal (for integrating and optimizing a pre-processing system). IES confirmed that it has made significant progress in developing and validating its technology, including a recent 14-day, 24/7 test with post-MRF residuals and SCAQMD source testing and follow-up analysis of test data for heat and mass balance. IES has stated that the information from these tests will be available for review.

- **Green Energy Corporation.** Green Energy Corporation responded by email, providing an explanation of the unit economics for their gasification technology when used in a turn-key facility. Their response did not address the specific issues outlined in the August 10th letter, except for agreeing to host a tour of their 5-tpd test unit in Denver, Colorado, and provided no commitment regarding willingness or ability to participate in the Phase II process.

Recommendations

Based on the responses submitted by the technology suppliers, as summarized above and in Table 1 (attached), ARI recommends that nine of the technology suppliers be included as Phase II participants and issued the detailed Request for Information (RFI). These nine technology suppliers are the six that were selected in Phase I as preferred, all of which have confirmed their willingness and ability to participate, and three of the other technology suppliers evaluated in Phase I that have demonstrated further technology developments and/or confirmed the availability of relevant new information. These three additional technology suppliers are: Ebara Corporation, for their TwinRec/TIFG technology, which has six years of commercial operation and is in operation in Japan processing MSW; Arrow Ecology for their unique, two-stage wet anaerobic digestion technology, which has demonstrated it overcomes disadvantages of other anaerobic digestion technologies, and in consideration of Arrow's partnering activities with one of the MRF/TS's on LA County's Phase I list; and International Environmental Solutions, based on recent developments with their gasification technology including recent SCAQMD source testing while processing MRF residuals.

Recommended Technology Suppliers for Phase II

Interstate Waste Technologies
Primenergy
Ntech Environmental
GEM America
Ebara Corporation
International Environmental Solutions
Changing World Technologies
Bioengineering Resources (BRI)
Arrow Ecology

Three technology suppliers have declined to participate: Waste Recovery Systems, Organic Waste Systems, and Canada Composting.

Two technology suppliers are not recommended at this time, but could be considered by the Subcommittee pending receipt of additional information. These technology suppliers are Geoplasma, which was not responsive to the August 10th letter or follow-up correspondence, and Green Energy Corporation, which responded via email but did not address the specific issues outlined in the August 10th letter or provide information to demonstrate new technology developments.

Table 1. Summary of Responses from Technology Suppliers

Technology Supplier	Confirmed Willingness and Ability to Participate in Phase II	Confirmed Ability to Provide Information	Confirmed Willingness and Ability to Partner with MRF/TS	Confirmed Ability to Work Within the Six-month Schedule	Identified Reference Facility for Purpose of Tour	Provided New Information for Consideration, Including Requested Information (as Applicable)
Interstate Waste Technologies	Yes	Yes	Yes	Yes	Yes	Three new facilities have begun commercial operation in Japan
Primenergy LLC	Yes	Yes	Yes	Yes	Yes	Siemens Building Technology added to team
Ntech Environmental	Yes	Yes	Yes	Yes	Yes	New developments to maximize recycling prior to energy recovery
GEM America	Yes	Yes	Yes	Yes	Yes	Reference facility would be new installation in Ohio, on schedule to be operational in November 2006
Changing World Technologies	Yes	Yes	Yes	Yes	Yes	New technology developments and updated operational experience to be described in response to RFI
BRI Energy	Yes	Yes	Yes	Yes	Yes	Corporate restructuring to Bioengineering Resources, Inc.
Waste Recovery Systems	*Declined to participate*					
Organic Waste Systems	*Declined to participate*					
Ebara Corporation	Yes	Yes	Yes	Yes	Yes	The TwinRec/TIFG technology has more than 6 years of commercial experience (including processing MSW), including 10 existing facilities with capacities ranging from 15-550 tpd.
Geoplasma LLC	*No response received*					
Arrow Ecology	Yes	Yes	Yes	Yes	Yes	Arrow provided a discussion of how its technology is unique in comparison to other anaerobic digestion technologies, thereby overcoming disadvantages such as feedstock suitability, pre-processing requirements, footprint needs, residue quantities, and product outputs. Arrow is already in an advanced stage of partnering with one of the MRF/TS's on LA County's Phase I list.
International Environmental Solutions	Yes	Yes	Yes	Yes	Yes	Formed strategic alliances (Northern Power Systems, Rainbow Disposal) and made significant progress in validating the technology with emission testing and operational performance.
Canada Composting	*Declined to participate*					
Green Energy Corporation	Green Energy Corporation responded by email, providing an explanation of the economics for their technology when used in a turn-key facility. Their response did not address the specific issues outlined in ARI's letter, except for agreeing to host a tour of their 5-tpd test unit, and provided no commitment regarding willingness or ability to participate in the Phase II process.					

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MEMORANDUM

TO: **Coby Skye, LA County DPW**

FROM: **Jim Binder, ARI Project Director**
Sue Higgins, ARI Project Manager

DATE: **September 20, 2006**

SUBJECT: **Conversion Technology Demonstration Facility**
Summary of Response from WRS/Valorga International
Regarding Participation in Phase II Evaluation

On August 10, 2006, following a process approved by the Subcommittee on July 31st, ARI sent letters to the fourteen technology suppliers that were previously evaluated by the Subcommittee in the Phase I process to determine if new information has become available that warrants further consideration. In a memorandum dated August 25, 2006, ARI summarized responses received from the technology suppliers and presented recommendations regarding participants for the Phase II Evaluation. As of the date of that memorandum, Waste Recovery Systems (WRS) responded that Valorga International had not yet indicated an interest in participating in Phase II. WRS subsequently contacted ARI providing notification that Valorga International and its parent company, Urbaser, were interested. WRS/Valorga submitted a response to the August 10th letter via email on August 30th, and in hard copy on September 5th. Additional information was submitted via email on September 5th. This memorandum summarizes the response submitted by WRS/Valorga, and presents ARI's recommendation regarding their participation in Phase II.

Summary of Response from WRS/Valorga International

In coordination with WRS, Valorga International submitted a letter confirming their ability and willingness to participate in the Phase II process. Valorga specifically confirmed a willingness and ability to provide information, to create a partnership with one or more MRF/TS owner/operators for development of a demonstration facility, and to work within the six-month schedule established for the project. Valorga did not cite a specific reference facility for purpose of a tour, but agreed to conduct a tour and provided summary information on ten existing facilities located in Europe (five of which process MSW or MSW and biowaste) and seven additional projects under development overseas and scheduled for startup in 2007 or 2008.

Valorga's reference facilities most often use the biogas to generate electricity or for cogeneration of steam and electricity. One of the existing Valorga facilities (Tilburg, the Netherlands), purifies the gas for distribution through the municipal gas supply, and planned Valorga facilities in Spain will upgrade and use biogas to power methane-fueled buses. The upgrading and use of biogas as an alternative vehicle fuel are cited by Valorga as examples of technology development.

WRS/Valorga received a score of 73.9 in the Phase I evaluation, positively reflecting their commercial experience with MSW, their long-term operating experience, their development experience with complete systems, and the strength of their technical and financial resources. WRS/Valorga was not selected in Phase I as a preferred technology supplier, because anaerobic digestion was considered to be a less suitable technology for processing MRF residue. In the August 10th letter, WRS/Valorga was specifically asked to address the reasons anaerobic digestion was not selected in Phase I as a preferred technology, and to describe in detail how they would overcome those issues. A summary of the response received by Valorga/WRS, for the individual issues, follows:

- **MRF Residue may be Unsuitable Feedstock.** Valorga currently processes MSW, other solid waste, and biowaste at its commercial facilities in Europe, which demonstrates that black-bin waste could be a suitable feedstock for their process. Regarding MRF residues, Valorga responded that it would be necessary to consider the composition of waste at a specific facility, and stated that anaerobic digestion is an ideal process for food, vegetable and green waste, more so than thermal processes that are adversely affected by the moisture content of these waste components.

- **Extensive Pre-Processing is Required.** Valorga's reference facilities include mechanical sorting (sometimes combined with manual sorting) for preprocessing, to recover additional recyclables and separate out non-biodegradable materials. Size reduction is also required. At this point in the project, Valorga's concept is that the existing MRF would accomplish the pre-processing, separating recyclables, the organic fraction, and residuals for thermal processing or landfill disposal. The Valorga anaerobic digestion technology would then process just the organic fraction. Based on information included in the Phase I report and observations during MRF/TS site visits, additional pre-processing of MRF residuals would likely be required to prepare a biodegradable-organic feedstock for anaerobic digestion.

- **Larger Footprint Requirements.** Consistent with information presented in the Phase I report, Valorga has confirmed that 7 or more acres would be required for a facility designed to process 100,000 tons per year. This is a larger footprint than required for the ArrowBio wet anaerobic digestion process and for the thermal and waste-to-fuel conversion technologies (approximately 3-4 acres for 100,000 tpy), and, according to the Phase I report and preliminary information gathered from recent site visits, greater than the area available at the MRFs being considered. The larger footprint requirement remains a significant disadvantage for the Valorga technology.

- **Larger Percentage of Residue Requiring Landfill Disposal.** Valorga did not disagree with this issue. The Valorga anaerobic digestion technology can have residue quantities of 30% or more by weight when processing MSW. The residue is generated during pre-processing required to separate biodegradable organics, and during post-processing (screening) of the compost to remove inert materials that passed through the digestion process. The quantity of residue generated in the Valorga process is higher than the ArrowBio wet anaerobic digestion process (20% residue) and higher than the thermal and waste-to-fuel conversion technologies (1-15% residue, assuming all products are marketed).

- **Generation of Mostly Compost and less Electricity.** Valorga generates a biogas with approximately 55% methane, compared to 70% or higher methane concentration in the biogas from the ArrowBio wet anaerobic digestion process. The reported electrical output for the Valorga technology is 140 kWh/ton, which is approximately half of the electrical output of the ArrowBio wet anaerobic digestion process and significantly less than half of the average electrical output of the thermal technologies. The Valorga technology generates compost at a rate of approximately 24% (or higher) by weight of MSW processed, compared to 14-17% for the ArrowBio process.

- **Marketing of Compost is Questionable.** Valorga cited sources, including a report published by CIWMB in 2004, indicating markets for compost in California currently exist and are expanding. While Valorga did not specifically address the viability of these markets for compost generated from waste, they did state that the quality of their compost exceeds all European and US standards. They acknowledged that a market development program would need to be established early in project development, with participation by the County, WRS and Valorga. They would engage marketing consultants, as necessary, to implement a market development program.

- **Pre-existing Development Activities in California - No Need for Demonstration Facility.** Valorga responded that they are unable to meaningfully comment on this issue, without a better understanding of its significance. Verbally, WRS responded that there is no action at this time on the planned facility in Palm Desert, California. WRS and Valorga had been selected by Waste Management to develop a 100,000 ton per year facility in Palm Desert, but Waste Management has since sold its operating interest to another firm.

Recommendation

Based on information presented in the Phase I report and supplemental qualifications provided in response to the August 10th letter, Valorga presents favorably as an established company with extensive knowledge, long-term operating experience, and strong financial and technical resources. In addition, Valorga has demonstrated technology developments that include continued construction of new facilities and alternative use for the biogas at two of the facilities currently under development (i.e., planned use as a motor vehicle fuel).

However, in addressing the issues raised in the Phase I report regarding disadvantages of anaerobic digestion, Valorga was direct in stating that not all of these disadvantages could be overcome. The specific disadvantages that the Valorga anaerobic digestion technology is unable to overcome are larger footprint requirements (7 or more acres for a facility designed to process 100,000 tpy, which exceeds the anticipated available area at the candidate MRF/TS sites); a larger percentage of residue requiring landfill disposal; and the generation of mostly compost and less electricity. Because WRS/Valorga is unable to demonstrate that their technology will overcome the disadvantages cited in the Phase I report for anaerobic digestion, we do not recommend including WRS/Valorga as a technology supplier in the Phase II process.

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MEMORANDUM

TO: **Coby Skye, LA County DPW**

FROM: **Jim Binder, ARI Project Director**
Sue Higgins, ARI Project Manager

DATE: **September 21, 2006**

SUBJECT: **Conversion Technology Demonstration Facility**
Review of "New" Technology Suppliers

To support the Subcommittee in its selection of technology suppliers for participation in Phase II of the conversion technology demonstration project, ARI has solicited and reviewed information on the capabilities of "new" technology suppliers that were not evaluated in the Phase I Study. "New" technology suppliers were identified by the County, based on its data base of companies that have directly contacted County staff and expressed an interest in the conversion technology project. The process that was followed to gather information for these technology suppliers is as follows:

- The County provided ARI with a list of 19 companies, identified as conversion technology suppliers that have contacted the County and expressed an interest in the County's project, but that were not evaluated in the Phase I Study.

- In verifying and updating contact information on the list, ARI identified one company that is no longer in business (Eco Technology, as reported by Harry Reninger, the listed contact person). This company was removed from the list.

- In coordination with the County, ARI prepared a letter and questionnaire (attached) establishing minimum criteria for participation and requesting: (1) basic information on the technology supplier and the technology offered; (2) confirmation of the technology supplier's willingness and ability to participate in Phase II; and (3) confirmation the minimum criteria are met. The letter and questionnaire were sent to the 18 "new" technology suppliers via e-mail on September 13th, with a response deadline of September 18th. The short response time was acknowledged and emphasized.

- ARI conducted follow-up communication (fax, phone, email) to confirm receipt of the letter and questionnaire by the companies. Thirteen of the 18 companies confirmed receipt, and five did not:

  - Three companies did not respond in any way, and/or were not reachable with the contact information available due to an inactive e-mail address, disconnected phone number, and/or no phone number (Enviro-Tech Enterprises, Waste Conversion Company, and Harold Craig).

  - Two companies were reached by telephone, and the letter and questionnaire were re-sent to an alternate e-mail address provided to us. However, no response was subsequently submitted by these two companies (Choren BTL/ANGTL LLC and Prime Environmental International).

- Two of the 18 companies replied formally (by e-mail), but declined to participate (Eco Waste Solutions - no reason specified, and World Waste Technologies - unable to meet all of the minimum criteria at this time).

- Eleven of the companies submitted responses to the questionnaire. These eleven companies are listed alphabetically in Table 1 (attached), along with ARI's review comments. As further described below and in Table 1, none of the eleven companies that submitted a response fully demonstrated compliance with the minimum criteria.

The minimum criteria that were established for review and evaluation of the "new" technology suppliers were developed in consideration of the minimum criteria from the Phase I Study, and in consideration of the experience and capabilities of the top-ranked technology suppliers from the Phase I Study. None of the eleven "new" technology suppliers have demonstrated that they meet all of the minimum criteria. All of the eleven "new" technology suppliers fall short of the minimum requirement established by one *or more* of the criterion. Most of the "new" technology suppliers could not or did not confirm that the technology has been demonstrated at a minimum capacity of 5 tpd, operating for at least one year and processing at least 1,000 tons in a one-year period of MRF residuals, MSW, RDF or similar feedstock. Many of the "new" technology suppliers do not have or did not provide information on an operating reference facility. Several of the "new" technology suppliers produce an RDF or similar, solid, fuel product, and have not offered a demonstrated, complete system for further conversion or processing of that product.

Considering the minimum criteria that were established, and based on the information that was submitted, none of the "new" technology suppliers that responded to the questionnaire are recommended by ARI for participation in the Phase II Study because none of those technology suppliers have demonstrated that they meet all of the minimum criteria.

Table 1. Los Angeles County Conversion Technology Project
Review of Responses from "New" Technology Suppliers
September 21, 2006

"New" Technology Suppliers that Responded to the Questionnaire	Are all of the Minimum Criteria Met?	Review Comments
Allan Environmental/ Waste Gasification Systems (Gasification)	No	**Incomplete Submittal Regarding Demonstration of Technology.** Pilot facility in Illinois is designed to process 5 tons per shift of a broad spectrum of waste, and is operated one shift per day. However, information was not provided regarding whether the pilot has operated for at least one year, and during one year processed at least 1,000 tons of MRF residuals, MSW, RDF or similar feedstock.
Arkenol/BlueFire Ethanol (Concentrated Acid Hydrolysis)	No	**No Operating Reference Facility / Incomplete Submittal Regarding Demonstration of Technology.** Responded "No" regarding ability to conduct a tour of an operating reference facility. Pilot facility in Japan was operated for about 4 years, but is not currently operated. Information was not provided regarding whether the technology has been demonstrated at 5 tpd or larger, for at least one year, processing at least 1,000 tons of MRF residuals, MSW, RDF or similar feedstock in any one year.
Cleansave Waste Corporation (Autoclaving to RDF)	No	**Incomplete Submittal Regarding Operating Reference Facility and Demonstration of Technology / Product Limitation.** No information was provided regarding an operating reference facility, or regarding whether the technology has been demonstrated at 5 tpd or larger, for at least one year, processing at least 1,000 tons of MRF residuals, MSW, RDF or similar feedstock in any one year. Technology generates RDF, with no further conversion of the RDF as part of the proposed technology.
EnerTech Environmental (Chemical Conversion by Heat/Pressure to Solid Fuel)	No	**Product Limitation / Incomplete System.** The technology chemically converts biosolids/organic waste to a solid fuel, used to replace coal, petroleum coke, and wood waste, or used as a feedstock for syngas production (gasification). The gasification component is not offered, so the system is not complete regarding product processing. The product is a solid fuel product, and falls within the intent of the County in not considering technologies that generate only RDF.
EnviroArc Technologies/ Nordic American Group (Gasification and Plasma Decomposition)	No	**Technology not Sufficiently Demonstrated for MRF Residuals, MSW, RDF or Similar Feedstock.** Reference facility is a pilot/demonstration facility in Sweden, which processes RDF on an intermittent basis (less than 1,000 hours per year and less than 1,000 tons per year). The reference facility does not meet the criteria for demonstration of the technology. For purpose of demonstrating the technology, a facility in Norway is identified. Although currently closed, this facility operated from 2001-2004 at greater than 5 tpd, but processed chromium contaminated tannery waste and industrial waste (pallets, plastic containers). Tannery waste and industrial waste (by segregated components) are not considered similar feedstock as MRF residuals, MSW or RDF.
Global Alternative Green Energy (GAGE) (Gasification/Ethanol)	No	**Technology not Sufficiently Demonstrated for MRF Residuals, MSW, RDF or Similar Feedstock.** Responded "No" regarding demonstration of the technology, because it does not meet the criterion of processing at least 1,000 tons of MRF residuals, MSW, RDF or similar feedstock in any one year.

Table 1. Los Angeles County Conversion Technology Project
Review of Responses from "New" Technology Suppliers (Continued)
September 21, 2006

"New" Technology Suppliers that Responded to the Questionnaire	Are all of the Minimum Criteria Met?	Review Comments
Global Recycling Group (Autoclave, Gasification and Conversion to Biodiesel and Methane Gas).	No	**Incomplete Submittal for Complete System.** The process consists of four parts: autoclaving to sanitize the waste and separate recyclables; thermal cracking (gasification) to create a syngas from the autoclaved waste; conversion of the syngas to methanol and methane, with combustion or sale of the methane; and blending of the methanol with vegetable oil to produce biodiesel. Information that was provided for a reference facility and for demonstration of the technology is limited to information on two facilities in Japan. Although not disclosed in the questionnaire, based on ARI's knowledge and based on information submitted to the County by Interstate Waste Technologies (IWT, another technology supplier), the two facilities identified are Thermoselect gasification facilities. Information on a reference facility and demonstration of the technology for a complete system (including autoclave and conversion to biodiesel and methane gas) has not been provided. In addition, IWT has represented that they are the exclusive licensee of the Thermoselect technology; Global Recycling Group's ability to offer the Thermoselect technology would require verification.
Herhof Gmbh (Biological Stabilization and Separation with Gasification)	No	**Product Limitation / Incomplete Submittal.** The technology generates a green fuel called Stabilat, which is identified as a marketable product to be used in a gasification facility to produce energy. It is unclear from the information provided if the gasifier is to be integrated with the Herhof technology, or if it would be a separate facility. A gasification technology is identified by name (BioConversion Technology, LLC), but no information is provided regarding an operating reference facility or demonstrated performance of the gasifier. The proposed gasifier is the same technology offered by another technology supplier (GAGE), who responded that the technology is not yet sufficiently demonstrated based on the County's minimum criteria (i.e., the gasification technology has not processed 1,000 tons of MRF residuals, MSW, RDF or similar waste within a one-year period).
Integrated Environmental Technologies (IET) (Plasma Enhanced Gasification)	No	**Lack of Operating Reference Facility / Technology not Sufficiently Demonstrated for MRF Residuals, MSW, RDF or Similar Feedstock / Incomplete Information.** IET has a reference facility in Taiwan and a pilot plant in Richland, WA, and has demonstrated (primarily with medical waste consisting mostly of paper and plastic, and with an undisclosed quantity of MSW) their Plasma Enhanced Melter (PEM) technology (vitrification). However, they are proposing a newer technology which they began to develop earlier this year (2006), called Plasma Enhanced Gasification (PEG). The newer and proposed PEG technology integrates their PEM technology (vitrification) with a gasifier. It is inferred from the information provided that the IET pilot plant in Richland, WA, includes an operational pilot of the PEG technology. However, the submittal is incomplete because it does not provide requested information on the pilot facility. Specifically, the submittal does not document that the pilot uses the PEG technology, or that it has a capacity of 5 tpd or larger and has operated for at least one year processing at least 1,000 tons of MRF residuals, MSW, RDF or similar feedstock in any one year.

Table 1. Los Angeles County Conversion Technology Project
Review of Responses from "New" Technology Suppliers (Continued)
September 21, 2006

"New" Technology Suppliers that Responded to the Questionnaire	Are all of the Minimum Criteria Met?	Review Comments
Recycled Refuse International (Autoclave)	No	**Lack of Operating Reference Facility / Product Limitation / Incomplete System.** Reference facility is a recycling facility in South Wales that processes mixed MSW, which is being retrofitted with autoclaves to enhance recycling and produce homogeneous fuel; retrofit to be operational in Spring 2007. No operating reference facility identified for the autoclave technology. The autoclave technology generates a cellulosic fiber, consisting of the organic fraction of the MSW and considered to be a type of RDF (solid fuel) or a feedstock for ethanol production. The technology supplier did not include information on post-processing to ethanol, so it is considered to be an incomplete system.
Zero Waste Energy Systems (Gasification)	No	**Incomplete Submittal.** No response regarding teaming partners; technology description not provided; no information provided regarding an operating reference facility; no information provided to document the technology has been demonstrated at 5 tpd or larger, for at least one year, processing at least 1,000 tons of MRF residuals, MSW, RDF or similar feedstock in any one year.

APPENDIX B

REQUEST FOR INFORMATION
OCTOBER 2006

Alternative Resources, Inc.

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October 27, 2006
1630-1A

Generic RFI provided to the nine technology suppliers selected to participate in the Phase II Study.

[Technology Supplier Name]
[Address]

Subject: Request for Information (RFI) - Los Angeles County, California Conversion Technology Demonstration Facility

Dear _____:

Your company responded affirmatively regarding its ability and willingness to participate in Phase II of the Los Angeles County Conversion Technology Demonstration Facility Project, and has been selected by the Alternative Technology Advisory Subcommittee (Subcommittee) to be one of nine Phase II participants. The technology suppliers selected as Phase II participants (listed in alphabetical order) are as follows:

Anaerobic Digestion Technology Suppliers
ArrowBio

Waste-to-Fuel Technology Suppliers
Bioengineering Resources, Inc.
Changing World Technologies

Thermal Technology Suppliers
Ebara Corporation
GEM America
International Environmental Solutions
Interstate Waste Technologies
Ntech Environmental
Primenergy

We have prepared this Request for Information (RFI) to initiate the Phase II process. Responses to Parts I, II and III of the RFI are requested by December 4, 2006; responses to Part IV (cost information) are requested by December 15, 2006. The RFI requests detailed information, and we recognize that preparing a response will require significant effort on your part. We appreciate your participation in this important project, and we understand that not all technology suppliers will be able to supply all of the information that is requested. However, we encourage you to respond to the extent possible. Through your participation, you have the opportunity to partner with one or more of four material recovery facilities/transfer stations (MRF/TS sites) that are being considered as host locations. These sites provide a feedstock for your process, and the potential to use certain existing infrastructure.

Introduction

The purpose of this RFI is to gather detailed information to independently review the qualifications of the selected technology suppliers to determine if each supplier can meet key requirements, and to independently verify the performance of the technologies. Concurrently, potential sites for a conversion technology facility as identified by Los Angeles County in the Phase I study (MRF/TS sites) are being evaluated on their ability to host a conversion technology demonstration project. Also, the viability of establishing an effective business relationship between site owner/operators and a technology supplier for project development is being assessed. Information on the MRF/TS sites is provided as part of this RFI.

One objective of this Phase II process is to identify preferred technology suppliers and preferred MRF/TS sites to facilitate development of a conversion technology demonstration project or projects that the County believes in and would be willing to support. County support could include providing endorsement for the project, providing resources to assist the parties in negotiation of required contracts for project development, providing financing support or facilitating grant or other funding opportunities, facilitating environmental permitting, providing public outreach services to obtain project support, and promoting markets for products. The County is currently working to identify specific incentives it will offer, and seeks your input as to what would be helpful or necessary to facilitate project development.

Project Definition

The County is seeking development of one or more conversion technology demonstration projects at one or more of the candidate MRF/TS sites. Project definition is expected to evolve, being dependent on the determination of preferred technology suppliers and preferred MRF/TS sites, as well as project development activities that may occur between these parties and the County. However, there are certain prerequisites for County support, including:

- The project must be designed to process MRF residuals and post-recycled, "black-bin" municipal solid waste (MSW). This waste generally consists of all residuals that, after recycled goods and materials are removed, would otherwise proceed to the landfill for final disposal. Attachment 1 provides assumptions regarding the composition of the waste that should be used for purpose of responding to this RFI. You may use refined assumptions based on more detailed information that you may have, but are requested to disclose your waste composition assumptions if they differ from those provided in Attachment 1, to enable us to understand and evaluate your submittal. Any pre-processing that is required to prepare a suitable feedstock from the MRF residuals and MSW must be a part of the proposed project. Likewise, any post-processing or management of products and residue must also be a part of the proposed project.

- The project must be able to process at least 100 tons per day (tpd) of MRF residuals and MSW. The project can be designed for greater than 100-tpd; an upper limit has not been defined. However, consideration should be given to the fact that this is intended to be a demonstration project to obtain confidence in the technology. The project's size should take into account the limitations of the site,

optimal throughput for the technology, market conditions, any requirements based on funding sources, and community reaction. Modular applications may be appropriate. Also, the project's size may be based on optimization of the technology at a particular site, such as integration of the conversion technology for on-site provision of combined heat, electricity, and/or cooling. The County expects that the actual project size will vary for individual technology suppliers, and possibly for the different MRF/TS sites. Technology suppliers responding to the RFI are not required to propose a project at each site, but can propose on more than one site or all sites, and can propose a size range, as appropriate.

MRF/TS Sites

Based on the findings of the Phase I study and follow-on activities, four MRF/TS sites are currently being considered through this RFI as candidate sites for development of a conversion technology demonstration project:

- Del Norte Regional Recycling and Transfer Station, located in Oxnard (Ventura County)
- Robert A. Nelson Transfer Station and MRF (RANT), located in Rubidoux (Riverside County)
- Perris MRF/TS, located in Perris (Riverside County)
- Community Recycling/Resource Recovery, Inc., located in Sun Valley (Los Angeles County)

Each site owner/operator has been contacted by the County and each has expressed an interest in participating in this effort. Information on the sites has been provided by the site owner/operators. Site owner/operators will also participate in reviewing the responses to this RFI.

Information on the MRF/TS sites is provided in Attachment 2, including contact information for the site owner/operators. In responding to this RFI as a technology supplier, you are requested to consider the specific characteristics of each site, and are encouraged to disclose information relevant to whether a particular site or sites is advantageous or disadvantageous specific to your technology. Technology suppliers are welcome to propose a project at one, more than one, or all of the MRF/TS sites, as appropriate. Technology suppliers are encouraged to contact the site owner/operators directly if additional site information is required for the purpose of responding to this RFI.

Evaluation Criteria

For the purpose of evaluating RFI responses and identifying preferred technology suppliers, evaluation criteria have been established. The evaluation criteria are summarized in Attachment 3. The evaluation criteria address technology supplier qualifications, technology performance, and cost, and will be applied to the information provided to comparatively rate the technology suppliers. Cost evaluations will principally consider the tipping fee projected by the technology supplier for the proposed demonstration facility, and assumptions used in projecting that tipping fee, as well as the projected tipping fee for a more viable commercial-scale facility, if

applicable. The total project cost as well as the financing being proposed by the technology supplier will also be considered. Likewise, cost savings achieved through optimization for combined heat, electricity, and/or biofuels will be considered. The County recognizes that, at this stage in the project, cost and other project-related economic information will be estimates only, based on good faith professional analyses and conceptual-level planning.

The evaluation criteria summarized in Attachment 3 reflect the goals of the project. The primary goals are to promote the development of conversion technology(ies) that will significantly increase the diversion of MRF/TS residual solid waste and/or post-recycled MSW from landfill disposal, beneficially use the products and residuals that are produced, and allow or pave the way for cost-competitive landfill diversion. The demonstration project is intended to demonstrate the feasibility of one or more reliable, technically feasible, economically viable and environmentally beneficial conversion technologies and to generate data that can be used by potential sponsors of projects to facilitate future development of additional conversion technology projects.

RFI Submittal Requirements and Forms

Attachment 4 to this RFI contains a detailed listing of submittal requirements, including a series of forms that have been developed to gather a consistent set of information from each of the participating technology suppliers. These forms should be completed and other information submitted as described in Attachment 4.

As previously stated, we recognize that a significant amount of information is being requested in this RFI, and are cognizant of the level of effort required to respond. We also understand that not all technology suppliers will be able to supply all of the information that is requested. We encourage you to complete the forms and submit the requested information to the extent possible. While all of the information requested is important and of value to us, significant points in the review that we are seeking to establish include: confidence in the technology's capability to manage MSW; the ability to successfully integrate the technology with the MRF/TS at the site(s) proposed; the ability to finance a project; and the ability to permit a project, including acceptable air emissions. The more detailed and complete your submittal is, the more effectively we can review and evaluate the technology in consideration of these key issues and the other evaluation criteria. We are available to speak with you during this process to answer any questions you have and guide you through the information requests. We encourage you to contact us as needed; our contact information is provided at the end of this letter.

Technology suppliers should assume that information submitted in response to this RFI is public information. Any information which is intended to be treated as confidential must be sent under separate cover and clearly designated as "CONFIDENTIAL." Distribution of such information will be limited to the County of Los Angeles and its agents, and the Subcommittee. The County will not distribute such information to other parties unless acceptable to the technology supplier. It is strongly recommended that technology suppliers share all or most of their responses publicly to engender public trust and build confidence in this evaluation process.

Project Schedule

A response to Parts I, II and III of this RFI is requested by close of business on Monday, December 4, 2006, and a response to Part IV (Cost Information) is requested by close of business on Friday, December 15th. Upon initial review and evaluation of the RFI responses, interviews and tours will be scheduled. Interviews are currently planned for the week of January 22, 2007, at the County's offices, followed by tours of reference facilities in February 2007. The Subcommittee may decide to conduct interviews and tours for only a shortlist of technology suppliers. A decision in this regard is expected in early January, along with release of a final schedule and details associated with interviews and tours.

Directions for Submittal of RFI Responses

RFI responses should contain the information requested in Attachment 4 and should be submitted in accordance with the schedule identified above. Responses should be submitted in hard copy and electronic format. Electronic copies will be distributed by ARI to project participants, including Subcommittee members, MRF/TS owner/operators, and interested municipal representatives in the communities where the MRF/TS sites are located. To enable this full distribution of information, two (2) printed copies of information and twenty-five (25) CD's should be submitted to ARI, and one (1) printed copy of information and one (1) CD should be submitted to the County as follows:

Two (2) printed copies and twenty-five (25) CDs to:	One (1) printed copy and one (1) CD to:
Alternative Resources, Inc. Attention: Susan Higgins 1732 Main Street Concord, MA 01742-3837	County of Los Angeles Department of Public Works Attn: Coby J. Skye, P.E. Environmental Programs Division 900 South Fremont Avenue Annex 3rd Floor Alhambra, CA 91803-1331

In closing, we would like to emphasize the importance of this project. While the effort required by the technology suppliers is significant, there is great value in participation. For example, this process is intended to facilitate partnering with site owner/operators, which presents the technology suppliers with a site location (including the potential to use certain existing site infrastructure) and an available feedstock. As a result of this RFI and the related evaluations, the County intends to identify a conversion technology demonstration project or projects that it believes in and will support. The County is currently working to identify the specific incentives and support it will offer, which may include providing financing support and facilitating environmental permitting.

Upon your receipt of this letter, and as you compile the information that has been requested, we encourage you to contact ARI if you have any questions or require clarifications. I can be reached at (978) 371-2054 extension 107 (shiggins@alt-res.com), or you can contact Dorothy Austin at (978) 371-2054 extension 102 (daustin@alt-res.com). We look forward to working directly with you to gather, review and evaluate the necessary technical, environmental, and financial data.

Very truly yours,

Susan M. Higgins

Project Manager

cc: C. Skye, Los Angeles County Department of Public Works
J. Binder, ARI
D. Austin, ARI
C. Clements, Clements Environmental

List of Attachments

Attachment 1:	Waste Composition Information
Attachment 2:	Specific Information on MRF/TS Sites
Attachment 3:	Evaluation Criteria
Attachment 4:	RFI Submittal Requirements and Forms

ATTACHMENT 1
WASTE COMPOSITION INFORMATION

ATTACHMENT 1
WASTE COMPOSITION INFORMATION

In order to provide uniformity among the RFI submittals, please use the following reference waste composition for preparation of the mass, energy and environmental data applicable to your proposed project. If you prefer to use different assumptions, particularly if additional, more relevant information is available to you, please disclose your specific assumptions to enable us to understand and evaluate your submittal.

1. ASSUMED COMPOSITION OF WASTE

Major Constituent	Sub-Constituent	% of Waste	
PAPER	Cardboard	2.58%	
	Newspaper	2.89%	
	Other paper	20.61%	
	SUBTOTAL PAPER		26.08%
GLASS			3.44%
METAL	Ferrous	3.90%	
	Aluminum	0.62%	
	Other metal	5.25%	
	SUBTOTAL METAL		9.77%
PLASTIC	PET/PETE containers	1.65%	
	HDPE containers	1.59%	
	Film plastic	10.02%	
	Misc. plastic	3.57%	
	SUBTOTAL PLASTIC		16.84%
ORGANIC MATERIALS	Food Waste	9.02%	
	Yard Waste	3.94%	
	Wood	4.94%	
	Textiles	6.45%	
	Other organics	12.85%	
	SUBTOTAL ORGANIC MATERIALS		37.20%
INORGANICS	i.e., concrete, soil, brick, gypsum		6.67%
TOTAL ALL CONSTITUENTS			100.00%

Source: 2005 Evaluation of Technologies, Tables 4-3 and B-15

2. Ultimate Analysis (Based on U.S. EPA Material Groups and Waste Composition Specified Above)

Chemical	% of Waste
C	30.58%
H	4.10%
O	16.00%
N	0.74%
Cl	1.35%
S	1.28%
Moisture	20.45%
Ash	25.50%
TOTAL	**100.00%**
Corresponding Heating Value (calculated)	
Higher Heating Value, HHV (Btu/lb)	5,968
Lower Heating Value, LHV (Btu/lb)	5,447

3. Ash Composition Assumptions

Chemical	% of Waste	% of Ash
Glass	3.44%	13.5%
Other inorganic	12.29%	48.2%
Metals	9.77%	38.3%
TOTAL	**25.50%**	**100.0%**

4. Metals Composition Assumptions

Metal	% of Waste	% of Metal
Aluminum	0.6187%	6.3%
Iron	3.9047%	40.0%
Arsenic	0.4968%	5.1%
Mercury	0.0276%	0.3%
Lead	0.5520%	5.6%
Cadmium	0.1104%	1.1%
Chromium	0.6624%	6.8%
Nickel	0.7589%	7.8%
Other Metals	2.6386%	27.0%
TOTAL	**9.7700%**	**100.0%**

5. Chemical Composition of Waste per U.S. EPA (Ultimate Analysis of Constituents)

Chemical	Newsprint	Other Paper	Food Waste	Yard Waste	Plastics	Textiles	Wood	Rubber / Leather
C	0.3662	0.3241	0.1793	0.2329	0.5643	0.3723	0.4120	0.4309
H	0.0466	0.0451	0.0255	0.0293	0.0779	0.0502	0.0503	0.0537
O	0.3176	0.2991	0.1285	0.1754	0.0805	0.2711	0.3455	0.1157
N	0.0011	0.0031	0.0113	0.0089	0.0085	0.0311	0.0024	0.0134
Cl	0.0011	0.0061	0.0038	0.0013	0.0300	0.0027	0.0009	0.0497
S	0.0019	0.0019	0.0006	0.0015	0.0029	0.0028	0.0007	0.0117
Moisture	0.2500	0.2300	0.6000	0.4500	0.1500	0.2500	0.1600	0.1000
Ash	0.0155	0.0906	0.0510	0.1007	0.0859	0.0198	0.0282	0.2249
TOTAL	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

6. Assumed Chemical Composition of Inorganics

Chemical	Fraction of Inorganics
C	0
H	0
O	0
N	0
Cl	0
S	0.0500
Moisture	0.0500
Ash	0.9000
TOTAL	1.0000

7. Assumed Waste Composition by U.S. EPA Material Group

Material Group	Percentage
Newsprint	2.89%
Other Paper	23.19%
Food Waste	9.02%
Yard Waste	3.94%
Plastic	16.84%
Textiles	6.45%
Wood	4.94%
Rubber / Leather	12.85%
Glass / Metal / Inorganics	19.88%
TOTAL	100.00%

ATTACHMENT 2
SPECIFIC INFORMATION ON MRF/TS SITES

Provided electronically to the technology suppliers.

ATTACHMENT 3
EVALUATION CRITERIA

EVALUATION CRITERIA

Technology Supplier Qualifications

Technical Resources. The technology supplier must have sufficient technical resources to design, permit, construct and operate a conversion technology facility, including product sales. The management structure and organization of the technology supplier and its teaming partners will be reviewed. The experience of the team in working together, and the qualifications and experience of each individual partner for its defined role and responsibilities, will be an important part of the evaluation.

Financial Resources. The technology supplier must have sufficient financial resources to finance and meet financial risks and obligations associated with design, permitting, construction and operation of a conversion technology facility. Factors that will be an important part of the evaluation include: the ability to obtain construction and operations payment and performance bonds and/or letters of credit; the financial resources of the technology supplier (and key team members), as indicated by its financial performance in recent years and by the strength of the resources available to it to support any guarantees provided; and the nature of any prospective teaming arrangements.

Financing Approaches. The technology supplier must demonstrate, by its experience or by obtaining statements of support from lending partners relative to financing, that it can finance the proposed project. The reasonableness of financing concepts discussed and confirmation of the ability to obtain financing will be an important consideration.

Financial Security. The technology supplier's experience in offering a single source guarantee for comparable services, and its ability and willingness to do so for this project and provide other forms of financial security such as insurance, bonds, and letters of credit, will be an important consideration.

Risk Postures. The technology supplier's risk posture for the project, particularly regarding the extent of risk it would take and conditions on such risk-taking for financing, permitting, facility performance, and product production and sales, will be important to the evaluation.

Economics

Project Costs. The total cost for project design and construction, annual operating costs, and the tipping fee projected by the technology supplier for the proposed demonstration facility will be considered, to determine if the proposed project is cost-competitive with other disposal practices or if it could be cost competitive for development at a larger, commercial-scale facility, if appropriate.

EVALUATION CRITERIA, CONTINUED

Technology Performance
Readiness and Reliability of Technology. Experience with existing or previously operated pilot, demonstration and/or commercial facilities using the technology will be evaluated to determine the readiness of the technology for application in California, to process MRF residuals and post-recycled MSW. Performance of these past applications will be evaluated to determine reliability of the technology to perform as a system, meeting performance expectations for waste throughput, product output and landfill diversion. Input from references will be an important consideration in evaluation of readiness and reliability. **Development of a Complete Process.** Process schematics, equipment arrangement, site layout and description of major system components must demonstrate a complete process (i.e., pre-processing, conversion, and post-processing or management of products). **Processing Capability (unit size, annual throughput, scaling).** The proposed capacity for the demonstration project must be supportable based on unit capacity and throughput demonstrated at existing or previously operated pilot, demonstration and/or commercial facilities using the technology. The need for scaling will be considered. **Material and Energy Balance.** The technology supplier must provide a material and energy balance that supports technology performance claims regarding conversion efficiency, energy generation, type and quantity of products, and diversion potential. **Diversion Potential.** The technology must achieve significant diversion from landfill disposal when processing MRF residue or post-recycled MSW. The amount of diversion that is achievable will be an important consideration in evaluation of technology performance. **Generation of Marketable Products.** The technology must provide for beneficial use of waste through the production of marketable products, fuel and/or energy. The technology supplier's plan for marketing products and its assessment of the strength of markets for the products generated will be considered. **Environmentally Sound.** The technology supplier must provide sufficient environmental data to provide confidence that the technology can be permitted in Southern California and meet expected emission levels. Net emissions reductions and other environmental benefits (compared to conventional disposal methods and analogous production processes) will be strongly favored. **Space/Utility Requirements and Site Integration.** The proposed demonstration facility must be designed such that the components of the proposed system can comfortably fit within the space available at the MRF/TS sites. The integration of the proposed system with existing site structures, including the extent to which new infrastructure or utility connections are required, will be considered as part of the evaluation.

ATTACHMENT 4
RFI SUBMITTAL REQUIREMENTS AND FORMS

ATTACHMENT 4
RFI SUBMITTAL REQUIREMENTS AND FORMS

Part I. General Information on Technology Supplier and Technology

Form I-1. Identification of Technology Supplier and Technology
Form I-2. Identification of Reference Facility(ies)
Form I-3. Project Concept

Part II. Technology Supplier Qualifications

Form II-1. Financial Resources Data

Part III. Technical and Environmental Information

Form III-1. Mass Balance Data
Form III-2. Energy Balance Data
Form III-3. Process Wastewater Characteristics

Part IV. Cost Information

Form IV-1. Construction Cost Estimate
Form IV-2. Operation and Maintenance Cost Estimate
Form IV-3. Product Revenues

Part I. General Information on Technology Supplier and Technology

The technology supplier shall provide general information about itself and its teaming partners, and about the technology it offers. To the best of your ability, please provide the information requested below.

I-A. Complete in full Form I-1, to identify by name the technology supplier and all teaming partners, to provide current contact information, and to provide a brief descriptive overview of the technology.

I-B. Complete in full Form I-2, which requests detailed information on an operating reference facility that can be toured, including providing specified references that can be contacted for that facility. If more than one reference facility can be toured, Form I-2 should be completed for each facility.

I-C. Complete in full Form I-3, which requests information on the technology supplier's project concept for a demonstration project at one or more of the MRF/TS sites identified in this RFI. Technology suppliers are <u>not</u> required to propose a project at each of the MRF/TS sites, but can propose on more than one site or all sites, and can propose a size range, as appropriate. A common proposal can also be offered for more than one site, as applicable and appropriate. The proposed concept must represent a complete process (i.e., pre-processing, conversion, and post-processing/management of products and residue, including energy generation, as applicable.) In support of Form I-3, provide a facility site layout, equipment general arrangement, schematic process flow diagram, and description of major system components for each project proposed. A facility site layout showing integration with existing or proposed site facilities is preferred. If available, an artist rendering or similar visual presentation of the proposed project would be beneficial.

I-D. Provide in table format or other summary fashion a listing of facilities that have previously or are currently operating with the proposed technology, with an emphasis on facilities that process or have processed MRF residuals, MSW, RDF or similar waste, and including the reference facility identified in Form I-2. For each facility that is identified, provide the following information: facility name; facility owner and operator; entity(ies) served by the facility; commercial status (pilot, demonstration or commercial facility); dates operated; design capacity (tpd); demonstrated operating capacity (tpd); number of units and unit capacity (tpd); annual availability; annual operating hours; quantity of MRF residuals, MSW or RDF processed; other waste processed, and other relevant information that demonstrates readiness and reliability of the technology.

I-E. Provide electronic copies of photographs from the reference facility listed in Form I-2 and/or from one or more of the facilities identified in I-D. Provide photographs in a format that can be reproduced by the County for reports, presentations, or other media (such as jpg).

I-F. A video presentation ("movie") of the technology in operation would be beneficial. If available, provide a video which shows in "tour fashion" the major system components from waste receiving, pre-processing, conversion and product/residue management.

FORM I-1
IDENTIFICATION OF TECHNOLOGY SUPPLIER AND TECHNOLOGY

I. Technology Supplier Information

Technology Supplier Company Name:

Name and Title of Contact Person:

Contact Information:
Telephone:
E-Mail:
Fax:
Mailing Address:

Listing of Teaming Partners by Company Name and Role:

II. Technology Information

Name of Technology:

Technology Supplier's Relationship to Technology (i.e., licensee, licensor, etc.):

General, Brief, Descriptive Overview of Technology:

FORM I-2
IDENTIFICATION OF REFERENCE FACILITY

Provide the following information for an operating reference facility that can be toured. Tours are currently planned to take place in February 2007. The facility must be operational at the time of the tours. Contact information requested below for the owner, operator, entity served, and primary regulatory agency is for the purpose of contacting these individuals as references; please provide complete contact information, including telephone number, mailing address and email address. If more than one operating reference facility is available to be toured, please complete this form for each facility you recommend as a reference facility.

1. Facility name:

2. Facility location:

3. Facility owner (name and full contact information):

4. Facility operator (name and full contact information):

5. Entity served by facility (name and full contact information):

6. Primary regulatory agency for facility (name and full contact information):

7. Design capacity (tpd):

8. Demonstrated operating capacity (tpd):

9. Annual availability (%):

10. Annual operating hours:

11. Type and quantity of waste processed:

12. Operating history of facility (including timeline of development and operation, and current operating status):

13. Description of the major components of the reference facility (e.g., type and capacity of equipment), with a discussion of the similarities and differences of the reference facility as compared to the proposed project(s):

14. Description of any unique circumstances associated with coordinating and conducting a tour of this facility:

FORM I-3
PROJECT CONCEPT

Technology suppliers are not required to propose a project at each of the MRF/TS sites, but can propose on more than one site or all sites, and can propose a size range, as appropriate. Please complete this Form I-3 for each site that a project is proposed for, or clearly specify all sites this form commonly applies to.

1. Identify MRF/TS Site(s) this Project Concept is applicable to:

2. Specify Capacity for a Demonstration Facility

Design Capacity	_____	tpy	_____	tpd
Unit Size	_____	tpy	_____	tpd
Number of Units	_____			
Annual Availability	_____	%		
Annual Throughput based on Specified Annual Availability	_____	tpy		
Land Area Required for Complete Facility Development at Specified Design Capacity			_____	acres

3. Specify Capacity for a Larger, Commercial-Scale Facility (If Required for Economic Viability)

Design Capacity	_____	tpy	_____	tpd
Unit Size	_____	tpy	_____	tpd
Number of Units	_____			
Annual Availability	_____	%		
Annual Throughput based on Specified Annual Availability	_____	tpy		
Land Area Required for Complete Facility Development at Specified Design Capacity			_____	acres

4. Provide a description of the proposed project, including a detailed description of all major system components required for a complete project. Major system components include, as applicable: pre-processing; conversion; post-processing and/or management of products and residue; collection and cleanup of synthesis gas, biogas or fuel gas; energy generation; process wastewater treatment; air pollution control equipment, and other components of similar significance. As part of the description for technologies that are thermal processes, please describe how the technology is distinguishable from conventional waste-to-energy technology, including how the synthesis gas is collected and cleaned.

5. Provide a facility site layout, equipment general arrangement, and schematic process flow diagram for the proposed project, preferably showing integration with existing or proposed site facilities, as applicable.

6. Describe the proposed technical approach to integrate the project at the specified MRF/TS site(s).

7. Describe the proposed approach for expansion of the demonstration facility to a larger, commercial-scale facility (if required for economic viability), including identification of the maximum capacity for the larger facility at the specified MRF/TS site(s).

8. If the proposed project would be capable of accepting and processing other types of waste in addition to MRF residuals and post-recycled MSW, please describe the type(s) and quantity of such other waste that could be processed and the potential benefits that could be achieved by processing these other waste types.

9. Provide other information relevant to the proposed demonstration project, if any, which the Respondent believes is helpful to further explain the proposed project concept.

Part II. Technology Supplier Qualifications

Technology supplier qualifications will be evaluated based on responses regarding the technology supplier and its team's business structure and organization, financial information, and other information. To the best of its ability, each Respondent should provide the information requested below.

Structure and Organization of Respondent

The County requests that the Respondent provide information regarding its structure and operations. This description should include the legal structure and contractual relationships among the individuals and/or entities constituting the Respondent or the Respondent's team, as follows:

II-A. Provide a discussion of the Respondent's business and its operations, business history and ownership structure (e.g., corporation, corporate subsidiary of another corporation, joint venture, partnership/LLC, etc.).

II-B. Identify each Major Participating Firm (defined as any participant whose participation would account for 15% of either or both of the construction value of the project or of the annual value of operations and maintenance) that is part of the Respondent's team, a description of its role in the project, and a description of the teaming, joint venture and/or principal subcontracting arrangement(s) that would be employed for the project.

II-C. Identify the location of the office from which the project would be supported, the name and address of the Respondent's parent company, if any, and the identification of the prospective performance guarantor.

II-D. Provide a discussion of the Respondent's relationship to the proposed technology (e.g., years of direct history with the technology; ownership and/or license arrangements; other parties involved in technology development and ownership, etc.); the territory(ies) covered by any licensing arrangements, the term(s) of any arrangement(s), and the extent of exclusivity of any arrangement(s) should be discussed; the Respondent should describe the extent of licensor financial, technical and management support (including the application and enhancement over time of the technology), and arrangements that exist or would be put in place to efficiently access such support.

It is also requested that the discussion of the Respondent's legal structure and organization include the following:

II-E. Provide a listing of all actions occurring in the past five years that have resulted in the barring from public bidding of the companies, any officer or director thereof, or any affiliate or related company; a listing of any cases within the last five years where the Respondent and any key team members failed to complete any similar work which it was contracted to perform or had a contract terminated by a government agency due to the quality of its work (if this occurred, indicate when, where, and why).

II-F. Provide a disclosure of any existing contract non-performance issues, including letters from its clients related to any non-performance issues including notices of default, terminations and breach; the Respondent should describe its actions to remedy non-performance issues.

II-G. Provide a listing of any lawful judgments, civil penalties, consent decrees, fines, or other sanctions within the last five years, as a result of a violation of any law, regulation or ordinance in connection with the business activities of the companies, any officer or director thereof, and any affiliate or related company. Identify if the Respondent is currently involved in any litigation. Provide a listing of all current investigations, indictments or pending litigation against the companies, any officer or director thereof, any affiliate or related company.

Financial Qualifications

The Respondent and each Participating Firm are requested to provide the financial information described below:

II-H. Provide an in-depth discussion of how the Respondent would supply financial resources to meet the terms of a contract, including certification of the availability of any "third-party" resources that will be available. This should include confirmation of the Respondent's ability to obtain and maintain customarily required insurance coverage and performance and payment bonds each in the amount of the construction value and the price for the first year of operations; and of its ability to obtain letters of credit in like amounts. The Respondent should list the nature and depth of corporate professional resources that would be available to it as needed in performing its obligations.

II-I. Complete *and sign* the "Financial Resources Data Form" (Form II-1).

II-J. Provide a description of the financial impact of any past or pending legal proceedings and judgments that could materially affect the Respondent's and/or guarantor's financial position or ability to provide services, along with a discussion of any material adverse changes in the financial position, resources or capabilities of the Respondent, the guarantor and/or any Participating Firm that has occurred over the past three years.

II-K. Provide copies of audited financial statements which include, at a minimum, income statement, balance sheet, and statement of changes in financial position, for the most recent fiscal year. For public companies, a copy of the most recent Form 10-K filed with the U.S. Securities and Exchange Commission (SEC).

II-L. For privately held companies, provide full information concerning any material changes in the mode of conducting business, bankruptcy proceedings, and mergers or acquisitions within the past year, including comparable information for parent and subsidiary companies and principals, and any actual and pending litigation in which the Respondent is involved.

II-M. If the Respondent is a subsidiary of a parent corporation and the parent corporation guarantees the performance of the subsidiary, then the information should also be provided for the parent corporation. In such a case, the Respondent should provide a letter from the parent corporation indicating the willingness of the parent corporation to guarantee the performance of the subsidiary in accordance with the terms of any contract that might be executed.

II-N. Respondent is encouraged to provide any other information that it believes is appropriate to fully reflect its financial strength.

All information should be provided in the English language. If the financial information required on the Financial Resources Data Form (Form II-1) is normally reported in other than U.S. dollars, the Respondent should convert such information to U.S. dollars and complete the Form in U.S. dollars, and shall indicate the exchange rate that was used for such conversion and the date on which the conversion calculations were performed.

Project-Related Discussion Items

In addition to providing the above information, the County requests that the Respondent address the following matters:

II-O. **Financial Security**. The County requests a discussion of the Respondent's prior experience in offering single source guarantees for comparable services, with the identification of instances in which a single source guarantee is now in-place or was in-place on projects which have naturally terminated (including the indication of whether such guarantees were unlimited or, if capped, the value of the guarantee under such cap). The County also requests that the Respondent presents its views regarding the provision of guarantees: Would it/does it offer cost and performance guarantees (either via the company or via a parent corporation)? Are any such guarantees provided with financial caps or limits? Would there be any non-financial limitations or constraints on the Respondent's provision of guarantees? Would it/does it offer security instruments such as letters of credit and construction and operations performance bonds?

II-P. **Risk Posture.** Provide a discussion of the extent of risk the Respondent would take, and conditions on such risk-taking, for financing, permitting, facility performance, and product production and sales. Regarding marketable products (materials, chemicals and/or energy products), the County requests a discussion of the Respondent's risk posture regarding: Would/does the Respondent take full business risk regarding product quality, marketability, sale and revenues derived from such products, and related risks such as residuals disposal? To what extent, if any, would the willingness to take such risks be dependent upon guarantees or assurances regarding MSW input quality and quantity? Under what other conditions or circumstances, if any, would the Respondent expect another party to bear some product- and market-related risks?

II-Q. **Project Financing.** This project will likely require private financing. The County requests that the Respondent identify and discuss any previous project financings it has been involved in, including matters such as: the value of the financing; the proportionate levels of debt and equity, as appropriate; the sources of debt and equity (generic, not by name); the term(s) of the financings; financial guarantee instruments and/or corporate financial guarantees associated with the financings; the all-in cost of capital associated with individual financings and a comparison with long-term corporate bond interest rates prevailing at the time(s) of the financings; the contractual structure of the arrangements that supported the financings, including key terms and conditions such as "put-or-pay" waste contracts, product sales agreements and/or construction period and operations performance security. As applicable, the Respondent should cite relationships with and references from banks or institutional lenders that have or would extend credit to the Respondent for the financing of the proposed project, and should provide a letter from such banks or institutional lenders citing terms necessary to provide financing. Respondent should also identify what contractual requirements, if any, are needed from the County to facilitate a private financing.

The County also requests that the Respondent present its ideas regarding feasible and appropriate financing approaches for the project contemplated by the solicitation, given the County's intentions regarding financing, lack of control of the waste stream, and the involvement of a MRF owner/operator. Along with this discussion of how the Respondent might finance the project, the Respondent should discuss possible contractual structures to support the financing (including major terms and conditions, including the major obligations of each participant), and indicate its confidence level regarding the financability of the project. In requesting this information, the County recognizes that the preparation of a formal financing plan is premature, but does request that the Respondent be as detailed and specific as is possible, given the information provided in this solicitation.

FORM II-1
FINANCIAL RESOURCES DATA
(To be completed separately for Respondent, Guarantor and Major Participating Firms*)

Name of company completing form

Name of individual completing form

Signature

1. Bond Information

Current credit ratings on two most recent senior debt issues.

	Issue Description	**Moody's Rating**	**S&P's Rating**
Issue 1			
Issue 2			

2. Financial Indicators

Fiscal Year End (Month): _____

		1	2	3	4	5
		2001	2002	2003	2004	2005
A.	Total Revenues	$	$	$	$	$
B.	Net Income	$	$	$	$	$
C.	Total Assets	$	$	$	$	$
D.	Current Assets	$	$	$	$	$
E.	Total Liabilities	$	$	$	$	$
F.	Current Liabilities	$	$	$	$	$
G.	Equity (C-E)	$	$	$	$	$

* Major Participating Firms include those whose participation amounts for 15% or more of either or both of the construction value of the project or of the annual value of operations and maintenance.

Using the information provided in the table, calculate:

A. Revenue Growth Percentages.

2002: (A2-A1)/A1 _____%
2003: (A3-A2)/A2 _____%
2004: (A4-A3)/A3 _____%
2005: (A5-A4)/A4 _____%

B. Profitability Percentages

RETURN ON REVENUE

2001: B1/A1 _____%
2002: B2/A2 _____%
2003: B3/A3 _____%
2004: B4/A4 _____%
2005: B5/A5 _____%

RETURN ON ASSETS

2001: B1/A1 _____%
2002: B2/C2 _____%
2003: B3/C3 _____%
2004: B4/C4 _____%
2005: B5/C5 _____%

C. Leverage Ratio

2001: E1/G1 _____
2002: E2/G2 _____
2003: E3/G3 _____
2004: E4/G4 _____
2005: E5/G5 _____

D. Net Worth

2001: C1-E1 $_____
2002: C2-E2 $_____
2003: C3-E3 $_____
2004: C4-E4 $_____
2005: C5-E5 $_____

E. Liquidity Ratio

2001: D1/F1 _____
2002: D2/F2 _____
2003: D3/F3 _____
2004: D4/F4 _____
2005: D5/F5 _____

Part III – Technical and Environmental Information

The technology supplier is requested to provide detailed technical and environmental information to support an evaluation of the performance and capabilities of the technology. To the extent possible, please provide the following:

III-A. Consistent with the overall system process flow diagram requested in Form I-3, provide a more detailed process flow diagram, as necessary, to support a comprehensive mass balance. Provide an overall system mass balance. In addition, complete[1] a separate mass balance data sheet (see blank Form III-1) for each significant process stream, to include external streams and internal feedback and recycle streams, keyed to the more detailed process flow diagram. Note that the mass balance data sheets are also intended to capture environmental data related to each process stream (including products, residuals, fuel gas, stack exhaust gases, etc.).

III-B. Consistent with the overall system process flow diagram requested in Form I-3, provide a more detailed process flow diagram, as necessary, to support a comprehensive energy balance. Provide an overall energy balance. In addition, complete[1] a separate energy balance data sheet (see blank Form III-2) for each significant energy stream, to include external inputs, internal feedback, and recycle streams, keyed to the more detailed process flow diagram. This data collection effort is intended to obtain sufficient information to understand specific parasitic requirements, energy export capabilities, and plant energy efficiency.

III-C. To supplement the energy balance information requested above, provide a discussion of the energy conversion efficiency that is expected to be achieved for the proposed energy generation equipment (e.g., gas engines, gas turbines, steam turbines, etc.)

III-D. Provide a detailed water balance keyed to a flow diagram, including evaporative losses and internal recycle streams.

III-E. Complete[1] Form III-3, which requests information on the quality of process wastewater before and after treatment, and provide supporting wastewater quality test reports that are recent, available and representative of the proposed process, for at least the reference facility(ies) identified in Form I-2 and preferably for other relevant facilities as well.

[1] Please do not leave any blank data fields. Blank data fields will slow the analysis of the technology and/or result in the perception of a poor vendor response. Where applicable, instead of leaving a blank, state whether the specific datum is either:

- Unavailable;
- Not measured;
- Negligible; or
- Not applicable.

III-F. Provide a discussion of the degree of pollutant reductions expected from the treatment and control technologies identified and described in Form I-3 as part of the process, including gas cleanup technologies, air pollution control technologies, wastewater treatment technologies, and other similar treatment and control technologies. For each technology, identify the pollutants it removes and the associated removal efficiencies, indicating if any removal efficiencies are guarantees.

III-G. Provide the three most recent years' worth of continuous emissions monitoring data that are available and representative of the proposed process, in the form of regulatory reports, summaries, and/or averaged data, for at least the reference facility(ies) identified in Form I-2 and preferably for other relevant facilities as well.

III-H. Provide the three most recent stack test reports that are available and representative of the proposed process, for at least the reference facility(ies) identified in Form I-2 and preferably for other relevant facilities as well.

III-I. Provide all fuel gas or synthesis gas test reports that have been generated in the past two years (or previously, if most recent), and that are available and representative of the proposed process, for at least the reference facility(ies) identified in Form I-2 and preferably for other relevant facilities as well.

III-J. Provide all residue and/or product analytical test reports that have been generated in the past two years (or previously, if most recent), and that are available and representative of the proposed process, for at least the reference facility(ies) identified in Form I-2 and preferably for other relevant facilities as well.

III-K. If applicable, provide a discussion of how the project is optimized through integration of the conversion technology for on-site provision of combined heat, electricity, and/or cooling.

III-L. Provide a discussion of the environmental benefits and advantages of the proposed technology. As part of the discussion, address the potential environmental benefits and advantages compared to conventional U.S. municipal solid waste disposal methods of landfilling and waste-to-energy. Also, address the potential environmental benefits and advantages compared to analogous production processes. For example, if the conversion technology’s primary product is electricity, compare to a conventional power plant. Similarly, if the technology’s primary product is oil, compare to a conventional oil refinery.

III-M. Provide a discussion of the Respondent's expectations regarding the ability to permit the proposed project in Southern California, considering factors such as guaranteed emission rates and the ability to substantiate meeting those rates. Document discussions that the respondent has had with applicable regulatory agencies and any concerns that have been raised by agency personnel.

FORM III-1
MASS BALANCE DATA

Mass Balance Data Sheet – Sheet No. _____ of _____
Process Flow Diagram Stream No. _____
Nominal Facility Throughput Basis: _____ tpd of waste *as received*

Parameter	Data	Basis/Data Source/Comments
Basic Information		
Name of Substance		
State of Substance (gas, liquid or solid)		
Mass Rate (lb/hr)		
Pressure (lb/sq.in. absolute)		
Temperature (degrees Fahrenheit)		
Ultimate Analysis with Chlorine, as received basis		
Carbon (weight %)		
Hydrogen (weight %)		
Nitrogen (weight %)		
Sulfur (weight %)		
Chlorine (weight %)		
Inorganic Materials (e.g. Ash, Glass, Metals and/or Particulate Matter, and other inerts) (lb/hr or weight %)[1]		
Oxygen (weight %)		
Moisture (weight %)		
TOTAL WEIGHT PERCENT		
Heating Value		
Higher Heating Value (HHV), also known as Gross Calorific Value (Btu/lb)		
Lower Heating Value (LHV), also known as Net Calorific Value (Btu/lb)		
Recoverable Materials Content		
Iron (weight %)		
Aluminum (weight %)		
Metal, other than iron or aluminum (weight %)		
Cardboard (weight %)		
Paper, other than cardboard (weight %)		
Glass (weight %)		
Plastic: PET/PETE (weight %)		
Plastic: HDPE (weight %)		
Plastic: Film (weight %)		
Plastic, not PET/PETE, HDPE or Film (weight %)		
Other: _____ (weight %)		
Other: _____ (weight %)		
TOTAL Recoverable Materials (weight %)		

Environmental Pollutants		
Arsenic (wt % or ppmw)[1]		
Mercury (wt % or ppmw[1])		
Lead (wt % or ppmw)[1]		
Cadmium (wt % or ppmw)[1]		
Chromium (wt % or ppmw)[1]		
Nickel (wt % or ppmw)[1]		
Dioxins & Furans, Total Mass Basis (nanograms/hr or pptw)[1]		
Dioxins & Furans, International Toxic Equivalents Basis (nanograms/hr or pptw)[1]		
Gaseous Stream Composition (gas streams only)		
Carbon Monoxide (volume% or ppmv)[1]		
Carbon Dioxide (volume % or ppmv)[1]		
Methane (volume % or ppmv)[1]		
Hydrocarbons other than methane (volume % or ppmv)[1]		
Nitrogen other than nitrogen oxides (volume % or ppmv)[1]		
Nitrogen Oxides (NOx) (volume % or ppmv)[1]		
Nitrous Oxide (N2O) (volume % or ppmv)[1]		
Sulfur Dioxide (volume % or ppmv)[1]		
Sulfur Trioxide (volume % or ppmv)[1]		
Sulfuric Acid (volume % or ppmv)[1]		
Hydrogen Sulfide (volume % or ppmv)[1]		
Total Reduced Sulfur Compounds (volume % or ppmv)[1]		
Hydrogen Chloride (volume % or ppmv)[1]		
Oxygen (volume % or ppmv)[1]		
Moisture (volume %)		
Other _____ (volume %)		
TOTAL GAS COMPOSITION (volume %)		

[1] Please specify which of the optional units were selected for the data provided. Note ppmw indicates parts per million by weight, pptw indicates parts per trillion by weight, and ppmv indicates parts per million by volume. All gaseous pollutant concentrations are to be provided uncorrected (i.e., wet and at actual oxygen levels), including NOx and CO which are often stated on a corrected basis.

FORM III-2
ENERGY BALANCE DATA

Energy Balance Data Sheet – Sheet No. _____ of _____
Process Flow Diagram Stream No. _____
Nominal Facility Throughput Basis: _____ tpd of waste *as received*

Parameter	Data	Basis/Data Source/Comments
Electricity		
Rate of Supply (kW or kWhr/hr)		
Steam		
Rate of Supply (Btu/hr)		
Pressure (lb per sq.in. absolute)		
Temperature (degrees Fahrenheit)		
Enthalpy (Btu/lb)		
Natural Gas		
Rate of Supply (Btu/hr, HHV basis)		
Reference Heating Value (Btu/lb, HHV basis)		
Reference Heating Value (Btu per standard cubic foot, at one (1) atmosphere and 60 degrees Fahrenheit)		
Fuel Oil (process input or generated at the site)		
Rate of Supply (Btu/hr, HHV basis)		
Reference Heating Value (Btu/lb, HHV basis)		
Reference Heating Value (Btu/gallon, HHV basis)		
Biogas, Synthesis Gas or Fuel Gas (generated at the site)		
Rate of Supply (Btu/hr, HHV basis)		
Reference Heating Value (Btu/lb, HHV basis)		
Other Fuel (process input or generated at the site)		
Name of Fuel		
Rate of Supply (Btu/hr, HHV basis)		
Reference Heating Value (Btu/lb, HHV basis)		
Char or Residue (generated at the site)		
Rate of Supply (Btu/hr, HHV basis)		
Reference Heating Value (Btu/lb, HHV basis)		
Unburned Carbon (weight %)		

FORM III-3
PROCESS WASTEWATER CHARACTERISTICS
(applicable only if process wastewater is discharged from the facility)[1]

Parameter	Quantity in Wastewater before Wastewater Treatment	Quantity in Wastewater after Wastewater Treatment
Biological Oxygen Demand (BOD, mg/L)		
Chemical Oxygen Demand (COD, mg/L)		
Total Suspended Solids (TSS, mg/L)		
pH		
Total Nitrogen (mg/L)		
Phosphorus (mg/L)		
Chlorides (mg/L)		
Metals:		
Arsenic (mg/L)		
Cadmium (mg/L)		
Copper (mg/L)		
Lead (mg/L)		
Mercury (mg/L)		
Molybdenum (mg/L)		
Nickel (mg/L)		
Selenium (mg/L)		
Zinc (mg/L)		

[1] If there is more than one wastewater stream, please complete this form for each wastewater stream.

Part IV. Cost Information

Cost evaluations will principally consider the tipping fee projected by the technology supplier, and assumptions used in projecting that tipping fee. Capital cost (including permitting, design and construction), annual operating cost, and projected revenues, as well as the financing being proposed by the technology supplier, will also be considered. To enable cost evaluations, please provide the following information.

IV-A. **Cost and Revenue Forms.** Technology suppliers are asked to complete in full Form IV-1 (Construction Cost Estimate), Form IV-2 (O&M Cost Estimate) and Form IV-3 (Product Revenues) for each project configuration that they set forth in response to this RFI. As previously stated, Respondents are invited to propose a project at one, more than one, or all of the MRF/TS sites. Respondents can also propose a size range, as appropriate, for purpose of considering the economics of both a demonstration facility and, if the demonstration facility is not of a size that is commercially viable, a larger, optimal, commercial application. Cost and revenue forms should be completed for each proposed project. If costs and/or revenues are identical for more than one proposed project, a common form can be submitted; the form should specify all sites for which the costs are applicable.

IV-B. **Tipping Fees.** In addition to completing the cost and revenue forms identified in IV-A, technology suppliers are asked to provide estimated per ton tipping fee(s) (net of all costs and revenues) for the project configurations that they set forth in response to this RFI, including a net present value (NPV) analysis for cost over the term of the proposed project.

In support of the estimated tipping fee(s) and NPV analysis, technology suppliers are requested to provide the following details to supplement the information provided on the cost and revenue forms:

- Assumed debt-to-equity ratio that would be applied in the financing of the project.
- Assumed debt interest rate and equity pre-tax return requirement.
- Term of the assumed financing, to be determined by Respondent, with a County preference for a 20-year term for a common point of comparison.
- Escalation rate(s).
- NPV analysis with assumed discount rate.
- Assumed “soft costs” that would be incurred in structuring and placing a financing.
- Description of reserve funds or other structural requirements that may affect the ultimate level of debt borrowed or equity invested.

FORM IV-1
CONSTRUCTION COST ESTIMATE

Respondents are invited to propose a project on one, more than one, or all of the MRF/TS sites, and can propose a size range, as applicable. This form must be completed for each project configuration proposed by the Respondent (i.e., each project size at each proposed MRF/TS site). If the construction cost estimate is the same for a project at more than one MRF/TS site, one form can be completed with each applicable site identified.

Provide the estimated construction cost (U.S. dollars) for each project proposed at one or more of the MRF/TS sites identified in this RFI. Construction costs shall be all inclusive of design and engineering, permitting, testing, contractor development fees and costs, structures, equipment, storage facilities, environmental control systems, ancillary systems, vehicles, etc. Please include assumptions for any financing-related costs, including length of "typical" design and construction period.

1. Proposed MRF/TS Site(s): _____

2. Proposed Facility Capacity: _____ tons per year

   _____ tons per day

   Number of Units: _____

   Capacity of Units: _____ tons per day

3. Estimated Construction Cost (2006 dollars):

Item	Cost
Development (Fees, Permits, etc.)	$_____
Engineering & Design	$_____
Structures	$_____
Pre-Processing Equipment	$_____
Processing Equipment [1]	$_____
Power Generation Equipment	$_____
Storage Facilities	$_____
Utilities	$_____
Environmental Control Systems	$_____
Ancillary Systems	$_____
Vehicles	$_____
Other	$_____
Total Estimated Construction Cost	$_____

1. Including any processing/material handling associated with products and process residuals.

4. List all components included in "Other" for the construction cost estimate presented above in item 3.

5. List all assumptions for any financing-related costs associated with the construction cost estimate presented above in item 3, including length of "typical" design and construction period.

6. List all assumptions and conditions material to the construction cost estimate presented above in item 3, and indicate how such assumptions affect the individual line items (e.g., existing site conditions and the ability to use existing infrastructure, such as utilities, scales, roadways, etc.).

FORM IV-2
OPERATION AND MAINTENANCE COST ESTIMATE

Respondents are invited to propose a project on one, more than one, or all of the MRF/TS sites, and can propose a size range, as applicable. This form must be completed for each project configuration proposed by the Respondent (i.e., each project size at each proposed MRF/TS site). If the operation and maintenance cost estimate is the same for a project at more than one MRF/TS site, one form can be completed with each applicable site identified.

Provide the estimated operation and maintenance (O&M) cost (U.S. dollars) for each project proposed at one or more of the MRF/TS sites identified in this RFI. O&M costs shall be inclusive of all system components, including pre-processing, conversion, post-processing, residue management, and product management.

1. Proposed MRF/TS Site(s): _____

2. Proposed Facility Capacity: _____ tons per year

   _____ tons per day

3. Estimated O&M Cost (2006 dollars):

Item	Annual Cost ($/Year)
Labor (e.g., Salary & Benefits) (3A)	$ _____
Residuals Disposal (3B)	$ _____
Transportation/Haul Costs for Residuals (3C)	$ _____
Utilities (3D)	
Water	$ _____
Wastewater	$ _____
Natural Gas	$ _____
Fossil Fuel	$ _____
Imported Electricity	$ _____
Other	$ _____
Chemicals (3E)	
Air Pollution Control (carbon, lime, etc.)	$ _____
Water/Wastewater Treatment	$ _____
Process Operations	$ _____
Other	$ _____
Maintenance & Repair	$ _____
Capital Repair & Replacement	$ _____
Miscellaneous and Other Costs (3F)	$ _____
Total O&M Costs	$ _____

Please provide the following details associated with the O&M cost estimate presented above in item 3:

3A. Provide an organization chart showing staffing resources

3B. Specify annual quantity (tpy and % of incoming MSW) of residue requiring disposal, and assumed disposal cost ($/ton).

3C. Specify assumed distance to residue disposal locations, and assumed unit prices, for transportation costs.

3D. Specify quantity and assumed unit price, individually by type, of all required utilities and fuels.

3E. Specify quantity and assumed unit price, individually by type, of all chemicals required.

3F. Specify or describe miscellaneous/other costs, including type, quantity, and unit price, as applicable.

4. List all assumptions and conditions material to the O&M cost estimate presented above in item 3, and indicate how such assumptions affect the individual line items.

FORM IV-3
PRODUCT REVENUES

Respondents are invited to propose a project on one, more than one, or all of the MRF/TS sites, and can propose a size range, as applicable. This form must be completed for each project configuration proposed by the Respondent (i.e., each project size at each proposed MRF/TS site). If the product revenue information is the same for a project at more than one MRF/TS site, one form can be completed with each applicable site identified.

Provide the estimated product revenues (U.S. dollars) for each project proposed at one or more of the MRF/TS sites identified in this RFI.

1. Proposed MRF/TS Site(s): _____

2. Proposed Facility Capacity: _____ tons per year

_____ tons per day

3. Complete Table IV-1, specifying products, quantities, unit value or price, transportation costs, and annual revenues (net of transportation) (2006 dollars).

4. Provide a marketing plan. Identify the likely markets for all products identified in the product revenue table (i.e., end users and location of those end users), describe the product quality necessary to market the products at the assumed unit values, and discuss how the products would meet the necessary quality standards. Provide a discussion of marketing risks and uncertainties (i.e., price volatility) and disclosure of financial consequences (i.e., cost impacts) of market fall-off or market rejection of products.

Table IV-1. Summary of Product Revenues

Products and/or Recovered Materials	Annual Amount of Products and Recovered Materials			Unit Value or Price		Transportation Cost		Annual Revenue (net of transportation)
	Percent of Incoming Waste	Quantity	Units	Price	Units	Price	Units	
Recyclables								
Ferrous Metal								
Aluminum								
Mixed Plastic								
Sorted Plastic								
PET								
HDPE								
Film Plastic								
Glass								
Mixed Glass								
Clear								
Green								
Brown								
Cardboard (OCC)								
Mixed Paper								
Other (Specify)								
1.								
2.								
3.								
Fuel/Energy Products								
Biogas/Syngas/Fuel Gas								
Electricity								
Steam								
Hot Water								
Biodiesel								
Ethanol								
Other (Specify)								
1.								
2.								
3.								
Compost								
Other Products (Specify)								
1.								
2.								
3.								
4.								
5.								
6.								
							Total Annual Revenue:	

APPENDIX C

COMPARATIVE SUMMARY TABLES FOR TECHNOLOGY EVALUATIONS

Table C-1
Summary of Technology Performance
List of Tables

Technical Criterion	Table	Table No.
Readiness & Reliability	Readiness and Reliability	C-2
Development of a Complete Process	Development of a Complete Process	C-3
Processing Capability	Processing Capability on a Daily (TPD) Basis	C-4a
	Process Capability on an Annual (TPY) Basis	C-4b
Material Balance	Overall Mass Balance – Engineering Basis	C-5
	Front End Recyclables Mass Balance	C-6
Energy Balance	Energy Balance – Summary of All Technologies	C-7
	Energy Balance – Arrow	C-7a
	Energy Balance – CWT	C-7b
	Energy Balance – IES	C-7c
	Energy Balance – IWT	C-7d
	Energy Balance – NTech Environmental	C-7e
Diversion Potential	Diversion Potential	C-8
Generation of Marketable Products	Products Generated –Output in kWh/ton & Percentages	C-9a
	Products Generated – Annual Output	C-9b
	Market Data Sources and Marketing Plans	C-10

Table C-2
Readiness and Reliability

Technology Supplier	Status of Development	Extent of Operational Experience	Reference Plant Toured
Arrow	One demonstration plant in operation continuously processing MSW (Israel) First commercial plant for MSW under construction (Australia)	Israeli plant has 100 TPD[(a)] capacity and has operated for over 3 years. Australian plant will have 300 TPD capacity.	Location: Hiriya, Israel Nominal Thruput: 31,025 TPY[(a)] Feedstock: Residential MSW Owner: Arrow Ecology & Engineering Overseas, Ltd. Operator: Arrow Ecology & Engineering Overseas, Ltd. Commenced Operation: 2003
CWT	One demonstration plant in operation processing poultry offal, feathers and bones (Carthage, Missouri). One pilot plant in operation for testing waste. This plant has tried a variety of wastes, including auto shredder residue and components of MSW. (Philadelphia, PA)	Demonstration plant has 248 TPD capacity and has operated intermittently for over 2 years. Pilot plant has 7 TPD capacity and has operated intermittently for 7 years.	Location: Carthage, Missouri Nominal Thruput: 63,400 TPY Feedstock: Food Processing Waste Owner: Changing World Technologies, Inc. Operator: RES, LLC Demonstrated Full Capacity: 2005
IES	One pilot and one demonstration plant in operation processing a variety of wastes, including MRF residuals (Romoland, CA) A larger unit (125 TPD) is in fabrication, intended for demonstrating a variety of wastes at a larger scale and for longer durations.	Demonstration plant has 50 TPD capacity and has operated intermittently for 3 years. Pilot plant has 8 TPD capacity.	Location: Romoland, CA Nominal Thruput: 16,425 TPY Feedstock: MRF residuals Owner: IES Operator: IES Commenced Operation: 2004

Table C-2
Readiness and Reliability

Technology Supplier	Status of Development	Extent of Operational Experience	Reference Plant Toured
IWT	Seven commercially operating plants in Japan, processing municipal and industrial wastes.	Largest of the seven plants, Kurashiki, has a 612 TPD capacity and has operated commercially for 4 years. Longest operating of the seven plants, Chiba, has a 330 TPD capacity and has operated commercially for almost 8 years.	Location: Kurashiki, Japan Nominal Thruput:191,000TPY Feedstock: Residential MSW and Industrial Waste Owner: Mizushima EcoWorks Operator: JFE Environmental Commenced Operation: 2005 Location: Chiba, Japan NominalThruput: 105,200TPY Feedstock: Industrial Waste (first year municipal waste) Owner: JRC (Japan Recycling Corporation) Operator: JRC Commenced Operation: 1999
NTech Environ-mental[(b)]	Wastec Kinetic Streamer One commercial plant using two kinetic streamers and ancillary equipment operates in Yorkshire, England.	Yorkshire plant has a design capacity of 220 TPD and has operated as a dirty MRF for approximately 2 years. The plant has not been commercially operated recently, and is currently being optimized. Renewal of continuous operation is planned for 2008.	Location: Yorkshire, England Nominal Thruput: 82,500 TPY Feedstock: Residential and Commercial MSW Owner: N. Yorkshire County Council Operator: Wastec Commenced Operation: 2005 (previously demonstrated at a clean MRF 2001 – 2004)

Table C-2
Readiness and Reliability

Technology Supplier	Status of Development	Extent of Operational Experience	Reference Plant Toured
	Entech Gasifier Over 100 Entech gasifiers have been installed since 1989. Over 20 of these use MSW as a feedstock.	Longest operating and largest unit processing MSW has a design capacity of 67 TPD and has operated since 1998 (almost 9 years). It is located in Malaysia. Trip logistics prevented viewing of this plant and an alternate was selected.	Location: Bydgoszcz, Poland Nominal Thruput: 1,000 TPY (3 TPD on clinical waste, said to be equivalent to 15 TPD on MSW feedstock) Feedstock: Clinical Waste Owner: Centre of Oncology Operator: Centre of Oncology Commenced Operation: 2005
	Royco Plastics to Oil Process Three commercial plants process plastics in North Korea and South Korea. A larger commercial plant is under construction in Australia.	The largest of the three commercial plants has 6 TPD capacity and has recently started operating. The Australian plant will have an 18 TPD capacity.	No plant was viewed.

[a] 100 TPD and 31,205 TPY at one shift of operation per day.
[b] NTech Environmental has not previously constructed a plant integrating all three technologies.

Table C-3
Development of a Complete Process

Technology Supplier	Process Equipment Included	Incomplete Processes or Equipment
Arrow	Wet, dirty MRF Two stage anaerobic digesters Wastewater treatment system Reciprocating Engine	Biogas scrubbing and/or add-on air pollution controls for the engine exhaust have not been defined and may be necessary.
CWT	Pre-processing (shredding, screening) Process piping and vessels for depolymerization and hydrolysis Separation process equipment Small boiler using fuel gas or natural gas to make process heat Wastewater treatment system Odor scrubbers	The renewable diesel may need further refining off-site for additional sulfur removal. Flare may be necessary to dispose of non-condensable gases for the demonstration scale plant.
IES	Drying equipment Pyrolysis unit and heat recovery steam boiler Air pollution controls Ash management systems Electric generating equipment	Heat rejection equipment has not yet been defined (air cooled condensers or cooling towers). This is not significant technically, but can affect project energy efficiency and economics.
IWT	Gasifier Syngas cleanup Combustion turbine and steam turbine (combined cycle) Air pollution control Process water treatment Cooling towers	The process is complete as described.

Table C-3
Development of a Complete Process

Technology Supplier	Process Equipment Included	Incomplete Processes or Equipment
NTech Environ-mental	Wastec Kinetic Streamer Dryer Entech low temperature gasifier Syngas fueled steam boiler Air pollution controls (partial) Residual ash management system Electric generating equipment (steam turbine) Royco plastics to oil process Process water treatment	Heat rejection equipment has not yet been defined (air cooled condensers or cooling towers). This is not significant technically, but can affect project energy efficiency and economics. Additional add-on air pollution controls have not been defined and may be necessary.

Table C-4a
Processing Capability on a Daily (TPD) Basis

Technology Supplier	Reference Facility Unit Size	LA County Proposed Demonstration Facility Unit Size	Scaling
Arrow	Israel: 1 x 100 TPD[(a)] front end 1 x 200 TPD back end Australia[(b)]: 2 x 150 TPD[(c)] front end 2 x 150 TPD back end Two front ends (wet MRFs) two back ends (Anaerobic Digestion).	LA County: 2 x 150 TPD[(c)] front end 2 x 150 TPD back end	No scaling (scaling of 1:1) would be needed for the LA County plant, relative to both the Israeli plant and the Australian plant under construction. Although the nominal capacity appears lower for the Israeli plant from end, that capacity represents one shift of operation. For the Australian and LA County projects, two shifts of operation are planned.
CWT	Philadelphia: 7 TPD Carthage: 248 TPD	LA County: 200 TPD	No scaling (1:1) appears to be required for the depolymerization and hydrolysis process elements. However, front end and intermediate solids separation equipment will be required for processing MSW, and are not in place at the Carthage plant. Relative to the pilot plant, required scale-up would be on the order of 30:1.
IES	Romoland: 50 TPD[(d)] New Unit[(a)]: 125 TPD[(d)]	LA County: 125 TPD[(d)]	Scaling of 2.5:1 is occurring between the Romoland plant and the New Unit. No scaling (scaling of 1:1) would be needed for the LA County plant, relative to the New Unit under construction.

Table C-4a
Processing Capability on a Daily (TPD) Basis

Technology Supplier	Reference Facility Unit Size	LA County Proposed Demonstration Facility Unit Size	Scaling
IWT	Chiba: 165 TPD x 2 Nagasaki: 110 TPD x 3 Kurashiki: 204 TPD x 3	LA County: 312 TPDxN where N = 1, 2 or 3	Scaling of 1.5:1 on a unit size basis is required between Kurashiki and LA County. An LA County plant with a 2-unit system (624 TPD) would be on parity (1:1) with the Kurashiki plant (612 TPD). An LA County plant with a 3-unit system (936 TPD) would be 1.5:1 compared to the Kurashiki plant.
NTech Environ-mental	Entech: Malaysia: 67 TPD Wastec: York: 220 TPD Royco: N.Korea: 6 TPD Australia[(a)]: 18 TPD	Entech: LA County: 89 TPD Wastec: LA County: 220TPD Royco: LA County: 22 TPD	The primary equipment, the Entech gasifier, requires scaling of 1.3:1. The front-end equipment (Wastec) does not require scaling. Scaling of 4:1 is occurring between the North Korean plant and the Australian plant. Little scaling (scaling of 1.2:1) would be needed for the LA County plant, relative to the Australian plant under construction.

(a) Capacity represents one shift of operation.
(b) Currently under construction.
(c) Capacity represents two shifts of operation.
(d) Stated capacity is at 20 percent moisture after drying of the MSW / MRF residue.

Table C-4b
Processing Capability on an Annual (TPY) Basis

Technology Supplier	Proposed Annual Throughput	Basis of Proposed Annual Throughput	Basis of Availability
Arrow	100,000 TPY MSW	300 TPD capacity 93% availability	ArrowBio engineering analysis based on demonstration plant operating experience, hourly basis.
CWT	51,100 TPY all waste 25,550 TPY MSW	200 TPD all waste inputs 100 TPD MSW 70% availability	Carthage Historical: 85% of scheduled operations (recent year), hourly basis
IES	MRF Residue: 79,661 TPY, wet[(a)] 41,062 TPY, dry[(b)]	242.5 TPD capacity, wet[(a)] 125 TPD capacity, dry[(b)] 90% availability	Estimated by IES in the absence of continous plant operating experience, hourly basis.
IWT	97,350 TPY x N where N = 1, 2 or 3 Two-Line Plant: 194,700 TPY	312 TPD capacity x N where N = 1, 2 or 3 85.6% availability	Chiba Historical; 87.3% of waste throughput capacity (first year of operation) Nagasaki Historical: 91.6% of waste throughput capacity (most recent two years averaged) Kurashiki Historical: 85.5% of waste throughput capacity (most recent two years averaged)

Table C-4b
Processing Capability on an Annual (TPY) Basis

Technology Supplier	Proposed Annual Throughput	Basis of Proposed Annual Throughput	Basis of Availability
NTech Environ-mental	137,790 TPY Plant 137,790 TPY Wastec kinetic streamers[c] 89,100 TPY Entech gasifiers 6,693 TPY[d] Royco plastics to oil	413 TPD Plant Capacity 91.4% availability 880 TPD kinetic streamers (4 units) (65% availability) 267 TPD gasifiers (3 units) (91.4% availability) 22 TPD plastics to oil (1 unit) (75% availability)	Based on gasifier availability as the core plant component.

[a] Wet MSW / MRF residue at 58.9 percent moisture.
[b] Dried MSW / MRF residue at 20 percent moisture.
[c] The stated throughput for the LA County project requires a lower availability, 43 percent, than the stated availability of the equipment, 65 percent. This likely indicates that excess capacity has been built into the project.
[d] The stated throughput for the LA County project requires a higher availability, 83 percent, than the stated availability of the equipment, 75 percent. This may indicate a discrepancy in either design or communication of the project parameters.

Table C-5
Overall Material (Mass) Balance – Engineering Basis[a]

Technology Supplier	Mass Inputs	Mass Outputs
Arrow	100% MSW	39% Water 17% Digestate 13% Residue 12% Biogas 18% Sorted Recyclables (incl. Sand)
CWT	50% MSW 30% Auto Shredder Residue 10% Fats, Oils, Greases 10% Used Oil	37% Oil Product 18% Carbon Fuel 10% Residue 10% Recyclable Metals in Solids 16% Water[b] 9% Non-Condensable Gases
IES	100% MSW	46% Syngas[c] 48% Water from Drying 5% Residue
IWT	60% MSW 2% Natural Gas 33% Oxygen 4% NaOH 1% HCl 0.4% Iron-chelate	81% Syngas[d] 8% Mixed Metals 8% Aggregate 2% Mixed Salts 1% Sulfur 0.6% Zinc Concentrate
NTech Environ-mental	44% MSW 56% Air Incorporated into Syngas	82% Syngas 10% Sorted Recyclables 2% Rigid Plastics to the Oil Process 2% Rubble 2% Water, excess from Drying 1.3% Inert Ash 0.7% Residue

[a] Power Generating Equipment is not included in the Plant-Wide mass balance for any of the technology suppliers.
[b] Water is an input to the process, as well as an output. There is more water generated in the process than is used. Shown here is only the net water output.
[c] If water from drying is excluded from the balance, the syngas mass output is 95 percent.
[d] Wet basis.

Table C-6
Front End Recyclables Mass Balance[a]

Recyclables Recovered	Percent in As-Received MSW	TPY[b] in As-Received Waste	Percent Recovered	TPY[b] Recovered	Percent of As-Received MSW
Arrow (100,000 TPY Plant)					
Paper	18.9%	18,940	0%	0	0%
Cardboard	3.4%	3,390	80%	2,710	2.7%
Ferrous Metals	3.5%	3,490	95%	3,320	3.3%
Non Ferrous Metals	0.4%	440	84%	370	0.4%
Film Plastics	4.9%	4,890	90%	4,400	4.4%
Mixed Plastics	5.0%	4,960	90%	4,470	4.5%
Glass	2.1%	2,070	80%	1,660	1.7%
Sand	1.6%	1,550	75%	1,160	1.2%
TOTAL (including paper)	39.8%	39,730	NA	18,090	NA
TOTAL (excluding paper) / Average	20.9%	20,790	87%	18,090	18.1%
NTech Environmental (137,790 TPY Plant)					
Paper & Cardboard	22.2%	30,590	50%	15,300	11.1%
Mixed Metals	6.1%	8,270	90%	7,440	5.4%
Film Plastics	3.4%	4,690	95%	4,450	3.2%
Rigid Plastics	6.0%	8,400	88%	7,360[c]	5.3%
Glass	3.8%	5,240	98%	5,130	3.7%
TOTAL / Average	41.5%	57,180	69%	39,680	28.7%

[a] Only Arrow and NTech Environmental propose front-end recycling for their processes.
[b] TPY are rounded here to the nearest 10.
[c] Of NTech Environmental's recovered rigid plastics, 6,693 TPY (4.9% of As-Received MSW) is to be sent to the plastics to oil process, and 748 TPY (0.5% of As-Received MSW) is to be sold as a recyclable.

Table C-7
Energy Balance – Summary of All Technologies

Technology Supplier	Plant Energy Inputs	Plant Energy Exports	Energy Efficiencies
Arrow	MSW Organics Heat Input (excluding plastics), 1,334 kWh/ton MSW	Net Electric Output, 253 kWh/ton MSW Useable Waste Heat for Export, 135 kWh/ton MSW	Plant energy efficiency is calculated here to be 19% for electricity generation by the reciprocating engine option. If the waste heat is utilized, plant energy efficiency increases to 29%.
CWT	MSW Input, 3,496 kWh/ton MSW Other Waste Inputs, 6,942 kWh/ton MSW Parasitic Electric Power, 633 kWh/ton MSW Natural Gas Input, 302 kWh/ton MSW	Renewable Diesel Product Output, 7,294 kWh/ton MSW Carbon Fuel Product, 2,574 kWh/ton MSW	Plant energy efficiency is calculated here to be 87% for renewable diesel and carbon fuel product outputs.
IES	MSW Input, 2,579 kWh/ton MSW Natural Gas Input, 467 kWh/ton MSW	Net Electric Output, 489 kWh/ton MSW	Plant energy efficiency is calculated here to be 16% for electricity generation by waste heat boiler and steam turbine.
IWT	MSW Input, 3,496 kWh/ton MSW Natural Gas Input, 422 kWh/ton MSW Air & Nitrogen Inputs, 200 kWh/ton MSW	Net Electricity Export, 851 kWh/ton MSW	Plant energy efficiency is calculated here to be 21% for electricity generation by a combined cycle combustion turbine.
NTech Environ-mental	MSW Organics Heat Input (excluding plastics and most paper & cardboard), 3,445 kWh/ton MSW Rigid Plastics Heat Input, 676 kWh/ton MSW	Net Electricity Export, 573 kWh/ton MSW[(a)] Net Oil Export, 492 kWh/ton MSW	Overall useful energy generating efficiency is calculated here to be 26%[(b)] accounting for both electricity and oil export energy values.

[(a)] The original RFI response indicated a net electricity export equivalent to 398 kWh/ton MSW. The increased export represents a more accurate picture of equipment capability.
[(b)] Based on the original RFI response, the overall useful energy generating efficiency was estimated at 21 percent. Due to the increased net electricity export, the statistic has been increased.

Table C-7a
Energy Balance – Arrow[a]

Technology Supplier	Energy Inputs	Energy Outputs	Energy Balance Closure and Energy Efficiency
Arrow	Wet MRF and Biogas Production		
	Plant Parasitic Electricity Consumption, 72.9 kWh/ton MSW MSW Organics Heat Input (excluding plastics), 1,334 kWh/ton MSW[b]	Biogas Output, 841 kWh/ton MSW[b] Loss to Digestate, 360 kWh/ton MSW[b] Loss from wet MRF, 133 kWh/ton MSW[b]	Balance closes 100% based on inputs and outputs shown here and because the MSW Organics Heat Input has been back-calculated from the energy outputs. Minor energy losses have been intentionally omitted. Conversion of MSW Organics (excluding plastics) to biogas has a 60% efficiency.[c]
	Power Generating Equipment (Reciprocating Engine Option)		
	Biogas Input, 841 kWh/ton MSW[b]	Gross Electricity Output, 325 kWh/ton MSW Usable Waste Heat for Export, 135 kWh/ton MSW Losses (calculated here by difference), 381 kWh/ton MSW	Balance closes 100% based on inputs and outputs shown here and because the Losses have been calculated here by difference. Conversion of biogas to electricity has a 39% energy efficiency.
	Overall Plant Balance		
	MSW Organics Heat Input (excluding plastics), 1,334 kWh/ton MSW[b]	Net Electric Output, 253 kWh/ton MSW Usable Waste Heat for Export, 135 kWh/ton MSW Plant Losses, 946 kWh/ton MSW	Balance closes 100% based on inputs and outputs and because the Losses have been calculated here by difference. Plant energy efficiency is calculated here to be 19% for electricity generation by the reciprocating engine option. If the waste heat is utilized, plant energy efficiency increases to 29%.

Table C-7a
Energy Balance – Arrow[(a)]

[(a)] Based on energy balance provided in RFI response for 100,000 TPY plant.

[(b)] Interview information indicating mass balance assumptions of 90% transfer of energy from incoming organics into digestion and 70% conversion of organics energy input to digestion into biogas. Note for the transfer of energy from organics that are incoming to the digestion process, the conversion to biogas is stated to range from 70% to 90%. Arrow chose to use the more conservative 70% assumption in their mass balance. The RFI response indicated a biogas heating value of 11,600 Btu/lb and other values are taken from the RFI response regarding energy balance for the 100,000 TPY plant. ARI back-calculated an MSW Organics (excluding plastics) heat input value, digestate losses and wet MRF losses given this information. ArrowBio received and reviewed the back-calculations made by ARI and made no comments.

[(c)] Calculated as (biogas output) / (parasitic electric input + MSW heat input).

Table C-7b
Energy Balance – CWT[a]

Technology Supplier	Energy Inputs	Energy Outputs	Energy Balance Closure and Energy Efficiency
CWT	Overall Plant Balance		
	MSW Input, 3,496 kWh/ton MSW Shredder Residue Input, 2,792 kWh/ton MSW Fats, Oils & Greases, 1,984 kWh/ton MSW Used Oil Input, 2,166 kWh/ton MSW Parasitic Electric Power, 633 kWh/ton MSW Natural Gas Input, 302 kWh/ton MSW	Renewable Diesel Product Output, 7,294 kWh/ton MSW Carbon Fuel Product, 2,574 kWh/ton MSW Solids Residue Output, 0 kWh/ton MSW Plant-wide Losses, 1,505 kWh/ton MSW[b]	Balance closes 100% based on inputs and outputs shown here and because the Losses have been calculated here by difference. Plant energy efficiency is calculated here to be 87% for renewable diesel and carbon fuel product outputs. Fuel products can be used at varying energy efficiencies ranging from 30% to 85%, depending on the application (i.e., engine, turbine, boiler, etc.).

[a] Based on the energy balance provided in a communication from CWT to ARI dated December 30, 2006 for a 200 TPD Capacity plant.
[b] Losses are calculated here by difference. Losses include the heating value of the unused non-condensable gases produced by the process.

Table C-7c
Energy Balance - IES

Technology Supplier (TS)	Energy Inputs	Energy Outputs	Energy Balance Closure and Energy Efficiency
IES	Steam Generating Efficiency ("Boiler Efficiency")[(a)(b)]		
	MSW Input, 2,579 kWh/ton MSW Natural Gas Input, 467 kWh/ton MSW	Gross Steam Output, 2,205 kWh/ton MSW Losses by Difference, 840 kWh/ton MSW	Balance closes 100% based on inputs and outputs shown here and because the Losses and Parasitic Load have been calculated here by difference. Steam generating energy efficiency ("Boiler Efficiency") is calculated here to be 72%.
	Overall Plant Balance[(a)]		
	MSW Input, 2,579 kWh/ton MSW Natural Gas Input, 467 kWh/ton MSW	Net Electric Output, 489 kWh/ton MSW Losses & Plant Parasitic Load, 2,556 kWh/ton MSW	Balance closes 100% based on inputs and outputs shown here and because the Losses and Parasitic Load have been calculated here by difference. Plant energy efficiency is calculated here to be 16% for electricity generation by a steam turbine.

[(a)] A plant-wide energy balance was not provided. ARI deduced an energy balance from the Proforma data provided in the RFI response for a 79,661 TPY plant.
[(b)] In addition to the plant-wide data provided above, we have estimated here that the steam generating efficiency of the dryer, pyrolysis unit, thermal oxidizer and waste heat boiler.

Table C-7d
Energy Balance – IWT[a]

Technology Supplier (TS)	Energy Inputs	Energy Outputs	Energy Balance Closure[b] and Energy Efficiency
IWT	Syngas Production		
	MSW Input, 3,496 kWh/ton MSW Natural Gas Input, 422 kWh/ton MSW O2 Facility Electricity, 177 kWh/ton MSW Gasification System Parasitic Electricity, 128 kWh/ton MSW Other Plant Parasitic Electricity, 120 kWh/ton MSW	Syngas Output, 2,297 kWh/ton MSW Gasification System Losses, 1,743 kWh/ton MSW	Balance closes 93% based on inputs and outputs provided by IWT, when parasitic electricity inputs are included. When the parasitic electricity inputs are excluded, the balance closes 103%. Conversion of MSW to syngas has a 53% energy efficiency, based on all energy inputs including parasitic electricity requirements.
	Power Generating Equipment (Combined Cycle Gas Turbine)		
	Syngas Input, 2,261 kWh/ton MSW Energy from Air and Nitrogen, 655 kWh/ton MSW Energy from Cooling Water, 46 kWh/ton MSW	Gross Electricity Output, 1,275 kWh/ton MSW Power Generating Equipment Losses, 1,687 kWh/ton MSW	Balance closes 100% based on inputs and outputs provided by IWT. Conversion of syngas to electricity has a 43% energy efficiency.
	Overall Plant Balance		
	MSW Input, 3,496 kWh/ton MSW Natural Gas Input, 422 kWh/ton MSW Air and Nitrogen Inputs, 200 kWh/ton MSW	Net Electricity Export, 851 kWh/ton MSW Plant-Wide Losses, 3,380 kWh/ton MSW	Balance closes 103% based on inputs and outputs shown here. Plant energy efficiency is calculated here to be 21% for electricity generation by a combined cycle combustion turbine.

[a] Based on the energy balance provided in the RFI response for a two process line, 623 TPD plant.

[b] Closure is calculated here on an output divided by input basis.

Table C-7e
Energy Balance – NTech Environmental[a]

Technology Supplier (TS)	Energy Inputs	Energy Outputs	Energy Balance Closure[b] and Energy Efficiency
NTech Environ-mental	MRF and Syngas Production		
	MSW Organics Heat Input (excluding plastics and most paper & cardboard), 3,445 kWh/ton MSW Plant Parasitic Electricity, 125 kWh/ton MSW Oil Production from Plastics	Syngas Chemical Energy Output, 2,452 kWh/ton MSW Syngas Thermal Energy Output, 993 kWh/ton MSW Gasifier Losses, 107 kWh/ton MSW	Balance closes 99% based on inputs and outputs provided by NTech, when parasitic electricity input is included. When the parasitic electricity input is excluded, the balance closes 103%. Conversion of MSW to syngas has a 69% energy efficiency, based on the chemical energy of the syngas output and all energy inputs including parasitic electricity requirements.
	Gasifier Gross Electricity Production		
	MSW Organics Heat Input (excluding plastics and most paper & cardboard), 3,445 kWh/ton MSW	Gross Electrical Generation, 700 kWh/ton MSW	Gross electricity production efficiency is estimated at 20% from the system including the dryer, gasifier, syngas fueled boiler, and steam turbine.
	Plastics to Oil Production		
	Rigid Plastics Heat Input, 676 kWh/ton MSW	Gross Oil Export, 492 kWh/ton MSW Fuel Gas Production, 126 kWh/ton MSW Carbon Fuel Production, 58 kWh/ton MSW	Balance closure could not be assessed. Conversion of plastics to oil has a 73% energy efficiency, based on the oil output and plastics energy input, and excluding parasitic electricity requirements.
	Overall Plant Balance		
	MSW Organics Heat Input (excluding plastics and most paper & cardboard), 3,445 kWh/ton MSW Rigid Plastics Heat Input, 676 kWh/ton MSW	Net Electricity Export, 573 kWh/ton MSW[c] Net Oil Export, 492 kWh/ton MSW	Plant electric generating efficiency is calculated here to be 17%[c] for a heat recovery steam boiler and steam turbine and accounting for MSW Organics Heat Input only. Overall export energy generating efficiency is calculated here to be 26%[c] accounting for both electricity and oil export.

Table C-7e
Energy Balance – NTech Environmental[a]

Technology Supplier (TS)	Energy Inputs	Energy Outputs	Energy Balance Closure[b] and Energy Efficiency

[a] Based on the energy balance provided in the RFI Response for a 137,790 TPY plant, and clarifications made in May and June, 2007.
[b] Closure is calculated here on an output divided by input basis.
[c] The original RFI response indicated a net electricity export equivalent to 398 kWh/ton MSW. The increased export shown in the above table represents a more accurate picture of equipment capability. Accordingly, plant electric generating efficiency and overall export energy generating efficiency have been revised upward. The plant electric generating efficiency was originally 12 percent based on the RFI response. The overall export energy generating efficiency was originally 21 percent based on the RFI.

Table C-8
Diversion Potential

Technology Supplier	Total Residue (Percent)	Total Residue (TPY)	Diversion Potential
Arrow (100,000 TPY)	13% Residue from Wet MRF	13,000 TPY Residue from Wet MRF	87%[(a)]
CWT (51,100 TPY)	10% Non Metal Solids	5,110 TPY Non Metal Solids	90%
IES (79,661 TPY)	5% Char	4,110 TPY Char	95%
IWT (194,700 TPY)	0%	0 TPY	100%
NTech Environ-mental (137,790 TPY)	1.2% Lime from Scrubbing 0.3% Residue, Waste Sorting 0.1% Process Residue	1,670 TPY Lime from Scrubbing 360 TPY Residue, Waste Sorting 130 TPY Process Residue	98%[(b)]

[(a)] Arrow's digestion process produces a digestate (compost) that they currently propose to market. This material would be generated at a rate of 17,300 TPY, or 17.3% of MSW input. If a suitable use for the material can not be found, the diversion potential of this technology would be reduced to 70%.

[(b)] NTech Environmental's gasification process produces an inert ash that they propose to market for use as a building material or road aggregate. This material would be generated at a rate of 4,570 TPY, or 3.3% of MSW input. In the front end sorting of the incoming MSW, rubble for recycle is collected at an estimated rate of 7,096 tpy, or 5.1% of MSW input. If neither the inert ash nor the rubble for recycle can be used, the diversion potential of this technology would be reduced to 90%.

Table C-9a
Generation of Marketable Products – Outputs in kWh/ton and Percentages

Technology Supplier	Energy Products[a]	Front End Recyclables[b]	Material Products[b]
Arrow	Net Electricity via reciprocating engine, 253 kWh/ton MSW at 19% plant efficiency[f]	Mixed Plastics, 4.5% Film Plastics, 4.4% Ferrous Metal, 3.3% Cardboard, 2.7% Glass, 1.7% Non-Ferrous Metal, 0.4%	Compost (digestate), 17.3%[c] Sand, 1.2%[c]
CWT	Renewable Diesel, 98 gallons/ton Waste at 87% plant efficiency[g]	Not applicable	Metals, 10%[d] Carbon fuel, 18.25%[e]
IES	Net Electricity via waste heat boiler and steam turbine, 489 kWh/ton MSW at 16% plant efficiency[f]	Not applicable	None
IWT	Net Electricity via combined cycle gas turbine, 851 kWh/ton MSW at 21% plant efficiency[f]	Not applicable	Mixed Metals, 12.75%[h] Glassy Aggregate, 12.75%[h] Mixed Industrial Salts, 3.36%[c] Zinc Hydroxide, 1%[c] Elemental Sulfur, 1.97%[c]
NTech Environ-mental	Net Electricity via syngas fueled boiler and steam turbine, 573 kWh/ton MSW at 17% process efficiency[f][i] Net Oil Product from plastics feedstock, 8.8 gallons/ton MSW at 73% process efficiency.	Mixed Metals, 5.4% Glass, 3.7% Cardboard (OCC) & Paper, 11.1% Rubble (i.e., dirt, concrete), 5.1% Rigid Plastic, 0.5% Film Plastic, 3.2%	Inert Ash, 3.3%

Table C-9a
Generation of Marketable Products – Outputs in kWh/ton and Percentages

[a] Shown for each technology supplier is the net energy output, as well as the energy conversion efficiency on the basis of facility energy product output divided by facility energy input.

[b] Shown for each recyclable or product is the percent produced by the facility on the basis of the total waste input (MSW for Arrow, IWT and NTech Environmental; MRF residual for IES; and combined wastes, including MSW, for CWT).

[c] As stated in original RFI response.

[d] Based on CWT assumption of 50% of solids weight as metal and given 200 TPD of total waste input and 40.0 TPD of solids output, as stated in original RFI response.

[e] Based on 36.6 TPD of carbon fuel generation and 200 TPD of total waste input, as stated in original RFI response.

[f] These technologies also have the potential for fuels production, but have not yet demonstrated such.

[g] As stated in January 8, 2007 written response to follow-up questions. (Revised from RFI submittal stating 87.6%).

[h] IWT indicated that the granulate output of the gasification reactor is 25.5%. The products price sheet provided by IWT split the granulate output 50:50 between the aggregate component and the mixed metals component.

[i] The original RFI response indicated a net electricity export equivalent to 398 kWh/ton MSW at 12 percent process energy efficiency. The increased export rate and process energy efficiency shown in the above table represents a more accurate picture of equipment capability.

Table C-9b
Generation of Marketable Products – Annual Outputs

Technology Supplier	Energy Products[a]	Front End Recyclables	Material Products
Arrow **(100,000 TPY)**	Net Electricity via reciprocating engine, 25,300 MWh/yr at 19% plant efficiency[e]	Mixed Plastics, 4,470 TPY Film Plastics, 4,400 TPY Ferrous Metal, 3,320 TPY Cardboard, 2,710 TPY Glass, 1,660 TPY Non-Ferrous Metal, 370 TPY	Compost (digestate), 17,300 TPY[b] Sand, 1,160 TPY[b]
CWT **(51,100 TPY)**	Renewable Diesel, 5 million gallons/yr at 87% plant efficiency[f]	Not applicable	Metals, 5,110 TPY[c] Carbon fuel, 9,350 TPY[d]
IES **(79,661 TPY)**	Net Electricity via waste heat boiler and steam turbine, 39,000 MWh/yr at 16% plant efficiency[e]	Not applicable	None
IWT **(194,700 TPY)**	Net Electricity via combined cycle gas turbine, 165,750 MWh/yr at 21% plant efficiency[e]	Not applicable	Mixed Metals, 24,820 TPY[g] Glassy Aggregate, 24,820 TPY[g] Mixed Industrial Salts, 6,540 TPY[b] Zinc Hydroxide, 1,950 TPY[b] Elemental Sulfur, 3,840 TPY[b]
NTech Environ-mental **(137,790 TPY)**	Net Electricity via waste heat boiler and steam turbine, 79,000 MWh/yr at 17% plant efficiency[e][h] Net Oil Product from plastics feedstock, 1.1 million gallons/yr at 73% process efficiency.	Mixed Metals, 7,440 TPY Glass, 5,130 TPY Cardboard (OCC) & Paper, 15,300 TPY Rubble (i.e, dirt, concrete), 7,096 TPY Rigid Plastic, 748 TPY Film Plastic, 4,450 TPY	Inert Ash, 4,570 TPY

Table C-9b
Generation of Marketable Products – Annual Outputs

[a] Shown for each technology supplier is the net energy output as well as the energy conversion efficiency on the basis of facility energy product output divided by facility energy input.

[b] As stated in original RFI response.

[c] Based on CWT assumption of 50% of solids weight as metal and given 200 TPD of total waste input and 40.0 TPD of solids output, as stated in original RFI response.

[d] Based on 36.6 TPD of carbon fuel generation and 200 TPD of total waste input, as stated in original RFI response.

[e] These technologies also have the potential for fuels production, but have not yet demonstrated such.

[f] As stated in January 8, 2007 written response to follow-up questions. (Revised from RFI submittal stating 87.6%).

[g] IWT indicated that the granulate output of the gasification reactor is 25.5%. The products price sheet provided by IWT split the granulate output 50:50 between the aggregate component and the mixed metals component.

[h] The original RFI response indicated a net electricity export equivalent to 54,840 MWh/yr. The increased export shown in the above table represents a more accurate picture of equipment capability. Accordingly, net process electric generating efficiency, which was originally 12 percent, has been increased to 17 percent.

Table C-10
Market Data Sources and Marketing Plans

Technology Supplier	Market Data Sources and Product Values (Gross)	Marketing Plans	Review Comments
Arrow	MRF Owner / Operator _____ Ferrous Metal, $160/ton Aluminum, $410/ton Sorted Plastic, $200/ton Film Plastic, $100/ton Mixed Glass, $70/ton Cardboard, $100/ton Electricity, $0.05/kWh Compost (Digestate), $0/ton	Arrow will rely on the MRF Owner / Operator's expertise for marketing recyclables. A plan has not yet been proposed for marketing the digestate. Project economics are based on using the compost as alternative daily cover, which is the lowest beneficial use.	Additional work is necessary for marketing the digestate at higher beneficial uses and value.
CWT	CWT experience in Missouri and adjacent states. _____ Renewable Diesel Product, $9/MMBtu (equiv. to $1.19/gallon) Ferrous Metal and Aluminum, $75/ton Carbon Fuel, $40/ton	CWT plans to further investigate products pricing and destinations in Southern California.	Sulfur content issues regarding the renewable diesel product may reduce the price for which the fuel may be sold (i.e., if sold to a refiner, value may be less than if sold in wholesale or retail distribution).
IES	Sources not disclosed _____ Electricity, wholesale $0.08/kWh Electricity, retail, $0.11/kWh	IES plans to negotiate power purchase agreements.	The only product from this technology is electricity. IES has assumed a mix of wholesale electricity sales (86%) and retail electricity sales (14%).

Table C-10
Market Data Sources and Marketing Plans

Technology Supplier	Market Data Sources and Product Values (Gross)	Marketing Plans	Review Comments
IWT	Variety of sources, including literature, local research, and industrial consumer data. _____ Electricity, $0.079/kWh Electric production tax credits, $0.009/kWh Mixed Metals, $136/ton Sulfur, $58/ton Zinc Concentrate, $472/ton Industrial Salts, $25/ton Aggregate, $22/ton	IWT plans to identify specific local companies that use the material products from the process, and to negotiate power purchase agreements.	The types of industries that use the non-energy products have been disclosed. Specific companies that would accept the products have not been disclosed.
NTech Environ-mental	Sources not disclosed _____ Electricity, $0.07/kWh Oil Product, $2.00/gallon Ferrous Metal, $30/ton Aluminum, $500/ton Glass, $30/ton Cardboard, $50/ton Mixed Paper, $50/ton	NTech Environmental plans to market the recyclables and the oil product and to negotiate power purchase agreements.	NTech Environmental has taken no credit for recyclables revenue in its economic proforma.

APPENDIX D

SCAQMD AIR QUALITY ISSUES AND PERMITTING PATHWAYS PREPARED BY ULTRASYSTEMS ENVIRONMENTAL

AIR QUALITY ISSUES

1.0 South Coast Air Quality Management District

1.1 Air Quality Issues

1.1.1 Pollutants of Concern

The criteria air pollutants of concern as established by the regulatory agencies are nitrogen oxides, carbon monoxide, particulate matter, sulfur dioxide, reactive organic gases, and ozone. Presented below is a description of each of these pollutants and their known health effects.

Nitrogen Oxides (NO_x) serve as integral participants in the process of photochemical smog production, and are precursors for certain particulate compounds that are formed in the atmosphere. The two major forms of NO_x are nitric oxide (NO) and nitrogen dioxide (NO_2). NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. NO_2 is a reddish-brown irritating gas formed by the combination of NO and oxygen. NO_x acts as an acute respiratory irritant and increases susceptibility to respiratory pathogens.

Carbon Monoxide (CO) is a non-reactive pollutant produced by incomplete combustion of carbon substances (e.g., gasoline or diesel fuel). The primary adverse health effect associated with CO is the interference of normal oxygen transfer to the blood, which may result in tissue oxygen deprivation.

Particulate Matter (PM) consists of finely divided solids or liquids such as soot, dust, aerosols, fumes and mists. Two forms of fine particulate matter are now recognized. Coarse particles, or PM_{10}, include that portion of the particulate matter with an aerodynamic diameter of 10 micrometers (i.e., 10 one-millionths of a meter or 0.0004 inch) or less. Fine particles, or $PM_{2.5}$, have an aerodynamic diameter of 2.5 micrometers (i.e., 2.5 one-millionths of a meter or 0.0001 inch) or less. Particulate discharge into the atmosphere results primarily from industrial, agricultural, construction, and transportation activities. However, wind action on the arid landscape also contributes substantially to the local particulate loading. Both PM_{10} and $PM_{2.5}$ may adversely affect the human respiratory system, especially in those people who are naturally sensitive or susceptible to breathing problems.

Sulfur Dioxide (SO_2) is a colorless, pungent, irritating gas formed by the combustion of sulfurous fossil fuels. Fuel combustion is the primary source of SO_2. At sufficiently high concentrations, SO_2 may irritate the upper respiratory tract. At lower concentrations and when combined with particulate matter, SO_2 may do greater harm by injuring lung tissue. In addition, SO_2 is, under certain conditions, transformed in the atmosphere to sulfuric acid and to particulate sulfate compounds.

Reactive Organic Gases (ROG) are compounds comprised primarily of atoms of hydrogen and carbon. The major source of ROG is the internal combustion associated with motor vehicle usage. Other sources of ROG include the evaporative emissions associated with the use of paints and solvents, the application of asphalt paving and the

use of household consumer products such as aerosols. Adverse effects on human health are not caused directly by ROG, but by reactions of ROG to form secondary pollutants. ROG are also transformed into organic aerosols in the atmosphere, contributing to higher levels of fine particulate matter and lower visibility. The term "ROG" is used by the California Air Resources Board (CARB) for air quality analysis and is defined essentially the same as the federal term "volatile organic compound" (VOC).

Ozone (O_3) is a secondary pollutant produced through a series of photochemical reactions involving ROG and NOx. O_3 creation requires ROG and NO_x to be available for approximately three hours in a stable atmosphere with strong sunlight. The health effects of O_3 include eye and respiratory irritation, reduction of resistance to lung infection and possible aggravation of pulmonary conditions in persons with lung disease. O_3 is also damaging to vegetation and untreated rubber.

Federal, State, and local agencies have set ambient air quality standards for certain air pollutants through statutory requirements and have established regulations and various plans and policies to maintain and improve air quality, as described below.

1.1.2 Ambient Air Quality Standards

Table 1 (Ambient Air Quality Standards for Criteria Air Pollutants) illustrates NAAQS and CAAQS for criteria pollutants.

Table 1 - Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time	California Standard	Federal Standard	
			Primary	Secondary
Ozone (O_3)	1-hour	0.09 ppm	---	---
	8-hour	0.070 ppm	0.08 ppm	0.08 ppm
Carbon Monoxide (CO)	1-hour	20 ppm	35 ppm	---
	8-hour	9.0 ppm	9 ppm	---
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm	---	---
	Annual Arithmetic Mean	0.030 ppm	0.053 ppm	0.053 ppm
Sulfur Dioxide (SO_2)	1-hour	0.25 ppm	---	---
	3-hour	---	---	0.5 ppm
	24-hour	0.04 ppm	0.14 ppm	---
	Annual Arithmetic Mean	---	0.030 ppm	---
Respirable Particulate Matter (PM_{10})	24-hour	50 $\mu g/m^3$	150 $\mu g/m^3$	150 $\mu g/m^3$
	Annual Arithmetic Mean	20 $\mu g/m^3$	---	---
Fine Particulate Matter ($PM_{2.5}$)	24-hour	---	35 $\mu g/m^3$	35 $\mu g/m^3$
	Annual Arithmetic Mean	12 $\mu g/m^3$	15 $\mu g/m^3$	15 $\mu g/m^3$

Source: California Air Resources Board, Ambient Air Quality Standards. February 22, 2007.

1.1.3 Attainment of Ambient Air Quality Standards

Table 2 (Federal and State Attainment Status for South Coast Air Basin) shows the area designation status of the SCAB for each criteria pollutant for both the NAAQS and CAAQS. Based on regional monitoring data, the Los Angeles County portion of the SCAB is currently designated as a non-attainment area for O_3, PM_{10} and $PM_{2.5}$.

Table 2
Federal and State Attainment Status for South Coast Air Basin

Pollutants	Federal Classification	State Classification[1]
Ozone (O_3)	Non-Attainment	Non-Attainment
Particulate Matter (PM_{10})	Non-Attainment	Non-Attainment
Fine Particulate Matter ($PM_{2.5}$)	Non-Attainment	Non-Attainment
Carbon Monoxide (CO)	Attainment	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment

Note:
1. Proposed 2006 State Area Designations, which were based on air quality data collected during 2003 through 2005, are currently under review by the CARB.

Source: California Air Resources Board, Area Designations Maps. [www.arb.ca.gov/desig/desig.htm]. September 29, 2006.

1.2 Plans

The SCAQMD is required to produce plans to show how air quality will be improved in the SCAB. The CCAA requires that these plans be updated triennially to incorporate the most recent available technical information.[1] A multi-level partnership of governmental agencies at the federal, State, regional, and local levels implement the programs contained in these plans. Agencies involved include the USEPA, CARB, local governments, Southern California Association of Governments (SCAG), and SCAQMD. The SCAQMD and the SCAG are responsible for formulating and implementing the Air Quality Management Plan (AQMP) for the SCAB. The SCAQMD updates its AQMP every three years. The 2003 AQMP was adopted in August 2003.[2] The ARB approved a modified version of the 2003 AQMP and forwarded it to the EPA in October 2003 for review and approval. The EPA had not approved the modified version of the 2003 AQMP at the time this analysis was prepared. The 2003 AQMP updates the attainment demonstration for the federal standards for O_3 and PM_{10}; replaces the 1997 attainment demonstration for the federal CO standard and provides a basis for a maintenance plan for CO for the future; and updates the maintenance plan for the federal NO_2 standard, which the SCAB has met since 1992.

1 CCAA of 1988.
2 On June 1, 2007, the SCAQMD Governing Board Adopted the 2007 AQMP. The 2003 AQMP was used for this analysis.

The 2003 AQMP is consistent with and builds upon the approaches taken in the 1997 AQMP and the 1999 Amendments to the Ozone State Implementation Plan (SIP) for the SCAB for the attainment of the federal O_3 air quality standard. However, this revision points to the urgent need for additional emissions reductions (beyond those incorporated in the 1997/1999 Plan) from all sources, specifically those under the jurisdiction of the CARB and the USEPA, which account for approximately 80 percent of the O_3 precursor emissions in the SCAB.

The 2007 AQMP[3] was adopted by the SCAQMD Governing Board on June 1, 2007. The 2007 AQMP addresses federal planning requirements for attainment of the federal 8-hour O_3 and $PM_{2.5}$ air quality standards, and to incorporate significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes and new air quality modeling tools. Assumptions provided by both CARB and SCAG, reflecting their most recent upcoming computer model (EMFAC7) for motor vehicle emissions and demographic updates, were incorporated. The 2007 AQMP builds upon the approaches taken in the 2003 AQMP. In addition, it also highlights the significant amount of reductions needed and the urgent need to identify additional strategies, especially in the area of mobile sources, to meet all federal criteria pollutant standards within the timeframes allowed under federal CAA. None of the strategies described in detail in the 2007 AQMP appears to be directly related to municipal solid waste conversion technologies.

1.3 How to Get Permits

Many components of conversion technology systems will require permits from the SCAQMD. The District's general policy is that any stationary source that emits any level of air pollution requires a permit, unless it is explicitly exempted. Exemptions are listed in Rule 219 (Equipment Not Requiring a Written Permit Pursuant to Regulation II). The trend in recent years is for the District to define "permit units," composed of groups of pieces of equipment that formerly required individual permits. This cuts down considerably on time and expense for all involved. Note that, even if a type of equipment or activity is exempt from needing a permit, it may still be subject to source-specific rules.

A Permit to Construct (PTC) is required before non-exempt equipment can be built, installed, or altered. This is a very important requirement. A facility can get into quite a bit of trouble if it begins any step of the construction process without the PTC. A PTC is good for one year; it then expires if the equipment has not been built. After the equipment is installed, the PTC acts as a temporary permit to operate (PTO). The permanent PTO is issued after the equipment is in full operation and has been inspected by the District. In some cases, an emissions test is needed before the PTO can be issued. Note that sometimes the equipment as finally installed and operating does not match exactly the description in the PTC. The PTO, as ultimately issued, is written to reflect the actual situation, if the differences are considered to be minor in nature.

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[3] South Coast Air Quality Management District, *Draft Final 2007Air Quality Management Plan*. Diamond Bar, California (May, 2007).

Applying for a permit can be simple or complicated, depending upon one's strategy. Our experience is that providing as much information to SCAQMD staff as early as possible pays off in reduced processing time. In any event, it is recommended that the conversion technology vendor and/or MRF meet in person with District staff, including upper-level managers, as soon as a preliminary project design is ready. The meeting is likely to have the following benefits:

- Permit application reviewers will be dealing with people that they have met, rather than with anonymous stacks of paper;

- District staff can point out regulatory issues and requirements that may have otherwise been overlooked by the applicant;

- The applicant and the SCAQMD can jointly determine the definition of "permit units;" and

- The applicant can learn exactly what the reviewing staff will want to see in the application.

A permit application consists of several standard forms, plus whatever additional information may help its processing. All applications must contain an Application for Permit to Construct & Permit to Operate (Form 400-A) and Form 400-CEQA (CEQA Environmental Quality Act), which helps the District decide whether it needs to prepare documentation under the California Environmental Quality Act (CEQA). In addition, the application must contain one or more "supplemental" forms, which provide detailed information on the description, operating characteristics, and emissions of the equipment to be permitted. An example would be Form 400-E-12 (Gas Turbine).

It is usually very useful to attach an appendix containing detailed emission calculations and a regulatory review. District Regulation II includes a comprehensive list of the required information. It is called, "List & Criteria Identifying Information Required of Applicants Seeking a Permit to Construct from the South Coast Air Quality Management District. District staff will compare the application with every applicable rule. By doing this in advance, the applicant can foresee and eliminate potential issues. Finally, it is helpful to include a Rule 1401 health risk analysis[4] with the application.

Permit processing fees must be submitted with the application. The fees, which are specified in District Rule 301, assume a certain level of effort by District staff to review the applications. For some equipment fee categories, the applicant will be billed for extra labor, if necessary. After the application is submitted the District has 30 days to decide, and notify the applicant in writing, whether it is "complete." If the application is incomplete, the applicant must submit additional materials, and then the District will have another 30 days to determine whether the application is complete. For most cases

[4] See Section 1.6.

covered by this discussion, the time limit for permit processing will be 180 days from the date that the application is deemed complete.

District Rule 212 (Standards for Approving Permits and Issuing Public Notice) require public notification of any permit application if any of the following circumstances applies:

a) The project is within 1,000 feet of the outer boundary of a school;[5]

b) The project would result in increases of at least 30 pounds per day of VOC, 40 pounds per day of NO_x, 30 pounds per day of PM_{10}, 60 pounds per day of SO_2, 220 pounds per day of CO, or 3 pounds per day of lead;[6] or

c) The cancer risks or other health risks due to the equipment exceed certain levels.

In general, the District prepares and the applicant mails notices to every address within one quarter mile of the project. If a school is within 1,000 feet of the project, then the notice must go to the parents of any school within one quarter mile of the facility and to each address (residence or business) within 1,000 feet.

If the project's emissions exceed the levels indicated in "b" above, then additional notification rules apply. The notice must be sent to a variety of State and local agencies and must be published. "Prominent advertisement" must be made in the area potentially affected the project. The notices include an evaluation by the District of the project's effects on air quality. The public must have 30 days to respond.

1.4 Applicable Prohibitory and Source-Specific Rules

The SCAQMD has several types of rules governing all emission sources, including those that do not require permits. The first are the "prohibitory" rules (Rules 401 – 481), which set limits on fuel characteristics, exhaust pollutant concentrations, mass emission rates, and other parameters, for a variety of types of equipment and activities. The second are the "source-specific" rules (Rules 1101 – 1196), which apply to more narrowly defined types of equipment and operations. The air toxics rules (Rules 1401 – 1470) apply to emissions of toxic air contaminants (TACs) and other non-criteria pollutants. Rule 1401 focuses on health risk from emissions of all TACs from new and modified permitted sources, while the remaining 1400-series rules apply to emissions of specific TACs. The remainder of this section is devoted to the prohibitory and source-specific rules. Air toxics are addressed in a later section.

It should be noted that the permit conditions for the conversion technology equipment may (and probably will) contain more stringent limitations on emissions than are specified by the rules, especially if the equipment must use best available control technology or lowest achievable emission rates.

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[5] Rule 212(c)(1).

[6] Rule 212(c)(2) and Rule 212(g).

Rule 431.1 – Sulfur Content of Gaseous Fuels

The purpose of this rule is to limit emissions of SO_2 from the burning of gaseous fuels in stationary sources that require permits. It applies to the types of gaseous fuels that will be produced by the conversion technologies reviewed here, as long as they have a gross heating value of at least 300 BTU per cubic foot. It does not matter whether the fuel is burned at the conversion technology facility or sold or transferred to another site or customer. The sulfur limit (measured as H_2S) is 40 parts per million by volume (ppmv) averaged over four hours. Any permitted stationary equipment that burns the fuel must have a system to monitor continuously either the sulfur content of the fuel before burning or the emissions of SO_2 after burning.

Section 431.1(g) contains several exemptions that may apply to conversion technology systems. For example, a syngas containing more than 40 ppmv of sulfur can be sold for use off-site if it is first passed through a sulfur removal unit that reduces its sulfur content to the required level.[7] A facility is also exempt from the 40-ppmv limit if total sulfur emissions, calculated as H_2S, are less than five pounds per day.[8]

Rule 475 – Electric Power Generating Equipment

Any new electric power generating equipment having a maximum rating exceeding 10 net megawatts may not discharge "combustion contaminants" exceeding both of following limits:

- 5 kilograms (11 pounds) per hour mass emission rate
- 23 milligrams per cubic meter (0.01 grains per standard cubic foot) concentration calculated at three percent oxygen on a dry basis averaged over fifteen consecutive minutes

Rule 1110.2 - Emissions From Gaseous- and Liquid-Fueled Engines

This rule applies to all stationary and portable engines over 50 brake horsepower (37.3 kilowatts). It sets maximum limits for NO_x, VOC and CO concentrations in engine exhaust. Because the limits are greatly in excess of those corresponding to best available control technology or lowest achievable emission rate, which will be required for these systems, this rule need not be discussed further.

Rule 1135 – Emissions of Oxides of Nitrogen from Electric Power Generating Systems

It appears that this rule would apply to electric power generation equipment associated with a conversion technology projects only if two circumstances occurred:[9]

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7 Rule 431.1(g)(1).
8 Rule 431.1(g)(8).
9 Rule 1135(b)(10).

a) The electrical generation equipment qualified as an "approved alternative or advanced combustion resource" and
b) The power is sold under contract to Southern California Edison Company, the Los Angeles Department of Water and Power, the City of Burbank, the City of Glendale, or the City of Pasadena.

None of the proposed electrical generation systems, as currently proposed for the LA County project, would qualify as an "alternative resource," which would be solar or geothermal energy, fuel cells, or other non-conventional technology. "Advanced combustion" resources include cogenerators, combined cycle gas turbines and other advanced combustion processes that may be components of the waste conversion technologies under consideration.

Most of this rule consists of District-wide emission limits placed upon the utilities that contract for the generated power. The part that is directly applicable to conversion technology systems is the requirement that NO_x emissions be no more than 0.10 pound per net megawatt hour on a daily average basis if the device is located within the District and no more than 0.05 pound per net megawatt hour on a daily average basis if the device is located outside the District. [10]

1.5 New Source Review

General Requirements

The explicit purpose of the SCAQMD's new source review (NSR) regulation (Regulation XIII) is to ensure that approval of permits for new or modified sources results in no net increase in emissions of nonattainment pollutants or their precursors.[11]

A major polluting facility in the South Coast Air Basin is one which emits or has the potential to emit 10 tons per year of volatile organic compounds (VOC), 10 tons of nitrogen oxides (NO_x), 100 tons per year of sulfur oxides (SO_x), 70 tons per year of particulate matter (PM_{10}), or 50 tons per year of carbon monoxide.[12] Note that if the threshold for any one of these pollutants is met, the facility is considered to be "major," and will be subject to lower achievable emission rate (LAER) limitations for all pollutants.[13]

Potential to emit (PTE) is defined as the maximum emissions that would occur, taking into account permit conditions that directly limit emissions; if no such conditions are imposed, then potential to emit is calculated by assuming maximum rated capacity, maximum daily hours of operation, and the physical characteristics of the materials processed.[14] Because use of air pollution control equipment, when required by the

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10 Rule 1135(b)(3).
11 Rule 1301(a)
12 Rule 1302(s)
13 Kay, M., A. Baez and H. Lange. *Best Available Control Technology Guidelines*, South Coast Air Quality Management District (Revised July 14, 2006), p. 3.
14 Rule 1302(ad).

SCAQMD, is always made a permit condition, controls are taken into account when calculating PTE. However, the only permit conditions that are considered for PTE calculations are those that directly limit emissions. Requirements for good housekeeping practices and other measures that would tend, over the long run, to reduce emissions do not count.

A new facility with a PTE less than 4 tons per year of VOC, NO_x, SO_x, or PM_{10}, or 29 tons per year of CO, is still subject to NSR but is exempt from the requirement to provide offsets for emission increases.[15]

BACT and LAER

All facilities subject to NSR must use best available control technology (BACT). Note that the SCAQMD uses the term "BACT" for non-major polluting facilities and the term "LAER" for major polluting facilities, as defined above.[16] Because preliminary estimates indicate that NO_x emissions from at least some of the conversion technology facilities will exceed 10 tons per year, we will assume that "LAER" will apply. The BACT or LAER requirements apply to all facilities, even those that are exempted from other NSR requirements.[17]

LAER as defined by the District must be at least as stringent as the version of LAER that is defined in Section 171(3) of the federal Clean Air Act.[18] The SCAQMD staff determines LAER on a permit-by-permit basis. It is the most stringent emission limit or control technology that is (a) found in a state implantation plan (SIP), (b) achieved in practice (AIP), or (c) is technologically feasible and cost-effective. For practical purpose, nearly all LAER determinations by the SCAQMD are based upon AIP because LAER based on SIPs is not stringent enough and California law constrains the District from using the third approach.[19] The District has its own compendium of LAER determinations for various emission source categories, but allows consideration of LAER determinations by other jurisdictions.

It was beyond the scope of this analysis to perform BACT/LAER evaluations for the conversion technologies under consideration. However, a preliminary review of some of the published requirements was conducted. It should be noted that air pollution control agencies such as the SCAQMD have in some cases not made the latest determinations publicly available. For example, the most recently published BACT determination for a gas turbine was made on January 30, 2004.

Table A lists BACT determinations for gas turbines, as reported by the several air pollution control agencies. Table B lists BACT determinations for gas-fired internal combustion engines.

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15 Rule 1304(d)(1)(A).
16 Kay et al., p. 15.
17 Rule 1303(a)(4).
18 Rule 1303(a)(2).
19 Kay et al., p. 15.

Table A – Example BACT Determinations for Gas Turbines

Equipment	Output	Emission Limits				Controls	Agency	Date
		NO_x	CO	PM_{10}	SO_2			
Combined Cycle	181 net MW combustion + 147 net MW steam turbine	2.0 ppmv dry @ 15% O_2	2.0 ppmv dry @ 15% O_2	0.01 gr/scf and 11 lb/hr	Monthly mass limit (not stated)	SCR and oxidation catalyst	SCAQMD	1/30/2004
Combined Cycle	2 to 40 MW	5.0 ppmv dry @ 15% O_2 2.5 ppmv dry @ 15% O_2 achieved in practice for > 12 MW	6.0 ppmv dry @ 15% O_2	Use natural gas fuel	Use natural gas fuel	SCR + water or steam injection for NO_x; oxidation catalyst for CO	BAAQMD	7/18/2003
Cogeneration	25.8 MW	2.5 ppmv @ 15% O_2	5 ppm @15% O_2	Not applicable	Not applicable	SCONOX, SCOSOX	San Diego County APCD	3/9/2000
Combined Cycle	170 MW	2 ppmv dry	6 ppm	0.02 gr/scf	0.02 gr/scf	Not specified	Florida Department of Environmental Protection	5/30/2006
Simple Cycle	48.7 MW	3.5 ppmv dry @15% O_2	6.0 ppmv dry @15% O_2	0.01 gr/scf and 11 lb/hr	Monthly mass limit (not stated)	Inlet air cooling and water injection for NO_x control	SCAQMD	2/10/2004

Table B – Example BACT Determinations for Gas-Fired Internal Combustion Engines

Equipment	Output	Emission Limits				Controls	Agency	Date
		NO_x	CO	PM_{10}	SO_2			
Internal Combustion Engine – Landfill Gas-Fired	1,850 bhp	0.6 g/bhp-hr	2.5 g/bhp-hr	0.2 lb/hr	0.10 lb/hr	Air/fuel controller	SCAQMD	2/20/2003
Internal Combustion Engine – Natural Gas-Fired	1,695 bhp	7.3 ppmv dry @ 15% O_2	36 ppmv dry @ 15% O_2	Not stated	Not stated	Three-way catalyst	SCAQMD	8/15/2006
Internal Combustion Engine – Waste Gas-Fired	> 50 bhp	50 ppmv @ 15% O_2, 0.6 g/bhp-hr, or 1.9 lb/MW-hr	300 ppm @15% O_2, 2.5 g//bhp-hr, or 1.9 lb/MW-hr	80% control	80% control	Water scrubbing of hydrogen sulfide from fuel gas	San Joaquin Valley Unified APCD	10/01/2002
Lean-Burn Internal Combustion Engine – Landfill Gas-Fired	1,856 bhp	0.65 g/bhp-hr	Not applicable in this case	0.10 g/bhp-hr	None	< 4% O_2 in exhaust	San Joaquin Valley Unified APCD	7/13/1999
Internal Combustion Engine – Fossil Fuel-Fired	> 50 bhp	5 ppmv @ 15% O_2	56 ppm dry@15% O_2, 0.6 g//bhp-hr, or 1.9 lb/MW-hr	0.02 g/bhp-hr or 0.06 lb/MW-hr	Natural gas	Selective Catalytic Reduction	San Joaquin Valley Unified APCD	10/01/2002

Modeling

Another NSR requirement is modeling to determine whether a new or modified facility would cause a violation, or "significantly" worsen an existing violation, of any state or federal ambient air quality standards.[20] The modeling is performed only for NO_x, CO and PM_{10}; photochemical modeling is not required. Appendix A to Rule 1303 defines, for each pollutant, the increases in (modeled) ambient air concentrations that would be significant. However, modeling is not required if emissions for all the pollutants are below certain screening levels. For combustion sources, the screening levels vary with heat input capacity. For example, for heat input between 30 and 40 million Btu per hour, the NO_x screening level is 1.31 pounds per hour.[21]

Emissions Offsets

The final major NSR requirement is the use of emissions offsets that exceed the emissions due to the new source. Applicants can eliminate the need for offsets by keeping their facility-wide NO_x and PM_{10} emission potentials below 4 tons per year. If that is not possible, then the applicant must purchase emission reduction credits (ERCs). ERCs are created when a facility permanently retires equipment that had been emitting criteria pollutants. The SCAQMD publishes a list of holders of ERCs and the amounts available for sale. The District also publishes information on recent transactions and average values over various time periods. For example, in 2006, the average sale prices of ERCs (in dollars per pound per day) were:

CO	$5,749
NO_x	$52,464
PM_{10}	$78,796
ROG	$2,320
SO_x	$34,423

Note that the prices of ERCs have risen significantly since 2004 when, for example, NO_x cost $8,187 per pound per day. Data for 2007 are very limited, but it appears that the prices continue to rise. Purchase of offsets is a one-time transaction; it is not necessary to purchase them annually.

The SCAQMD has established a "Priority Reserve" to provide credits at substantially reduced prices for specific priority sources.[22] The reduced prices are only for PM_{10}, SO_x, and CO; they are not for NO_x. Whether any of the conversion technologies that are being evaluated qualifies for these credits is uncertain. The types of sources that qualify include, but are not limited to, the following:[23]

> Innovative Technology. This includes equipment that "will result in a significantly lower emission rate from the affected source than would have

[20] Rule 1303(b)(1).
[21] Rule 1303 Appendix A, Table A-1.
[22] Rule 1309.1(a).
[23] Rule 1309.1(b).

occurred with the use of BACT" and can be expected to serve as a model for emission reduction technology.

Research Operations. A demonstration facility might qualify for the priority reserve, but for no more than two years.

Essential Public Service. None of the conversion technologies under review appears to meet the District's definition of an essential public service (publicly owned or operated sewage treatment facility, prison, police facility, school, hospital, construction and operation of a landfill gas control or processing facility, water delivery operation, or public transit).[24]

A facility might also qualify for priority reserve credits if it is an "electrical generating facility" (EGF). Rule 1309.1 is very specific about what constitutes an EGF. The only way that one of the electricity-generating technologies could qualify would be if it generates electricity for its own use and is less than 10 megawatts. Such an EGF would also have to meet the following requirements:[25]

- For each pollutant for which the facility receives a Priority Reserve credit, all existing equipment at the facility that emits the pollutant would have to meet best available retrofit control technology (BARCT). BARCT means an emission limitation that is based on "the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each class or category of source."[26]

- The applicant has to conduct a due diligence effort to obtain emission reduction credits for less money than it would have to pay if it obtains credits through the Priority Reserve.

- The new source must be fully and legally operational within three years of receiving a permit to construct.

- If the facility is a net generator of electricity (i.e. generates more than it uses), and the State of California is entering into long-term contracts for electricity at the time of permitting, then the facility has to enter into a contract of at least one year to sell to the State 50 percent of the portion of the power that has been generated through use of Priority Reserve credits.

All the above notwithstanding, it is not clear whether the conversion technologies under review would be able to purchase mitigation credits at the reduced rate. A facililty that submits an application for permit to construct after 2004 (which would be the case here) can purchase the credits only if it is "an In-Basin EGF." However, an In-Basin EGF is defined in the rule as an EGF that is in the South Coast Air Basin and "submitted a

[24] Rule 1302(m).
[25] Rule 1309.1(c).
[26] Rule 1302(i).

complete application to the California Energy Commission."[27] Generally, one does not have to submit an application to the California Energy Commission unless the electric capacity of the new system exceeds 50 megawatts.

As noted above, a facility is exempt from the offsets requirements if its emissions are below certain levels. In addition, the California Health and Safety Code explicitly exempt emissions offsets for "resource recovery and energy conservation projects,"[28] as long as they meet the following requirements:

- The project produces 50 megawatts or less of electricity. In the case of a combined cycle project, the electrical capacity of the steam turbine may be excluded from the total electrical capacity of the project for purposes of this paragraph if no supplemental firing is used for the steam portion and the combustion turbine has a minimum efficiency of 25 percent.

- The project processes municipal wastes and produces more than 50 megawatts, but less than 80 megawatts, of electricity.

- The project will use the appropriate degree of pollution control technology (BACT or LAER) as defined and to the extent required by the district permit system.

- Existing permits for any item of equipment to be replaced by the project, whether the equipment is owned by the applicant or a thermal beneficiary of the project, are surrendered to the district or modified to prohibit operation simultaneously with the project to the extent necessary to satisfy district offset requirements. The emissions reductions associated with the shutdown of existing equipment shall be credited to the project as emissions offsets in accordance with district rules.

- The applicant has provided offsets to the extent they are reasonably available from facilities it owns or operates in the air basin and that mitigate the remaining impacts of the project.

- For new projects that burn municipal waste, landfill gas, or digester gas, the applicant has, in the judgment of the district, made a good faith effort to secure all reasonably available emissions offsets to mitigate the remaining impact of the project, and has secured all reasonably available offsets.

According to Health and Safety Code Section 39050.5, a "resource recovery project" means a project which converts municipal wastes, agricultural wastes, forest wastes, landfill gas, or digester gas in a manner so as to produce energy as a byproduct in the air basin in which they are produced.

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[27] Rule 1309.1(b)(5)(A).

[28] California Health and Safety Code, §42314.

1.6 Air Toxics

In California, air toxics emissions are regulated at the Federal, State and local levels. Typically, a regulation begins as a National Emission Standard for Hazardous Air Pollutants (NESHAP) or Maximum Achievable Control Technology (MACT) Standard, promulgated by the USEPA. It is then translated into an air toxics control measure (ATCM) by the ARB. Sometimes, however, the ARB develops ATCMs independently of the USEPA. The ATCMs serve as guidelines for local district regulations. In the South Coast Air Quality Management District, Regulation XIV (Toxics and Other Non-Criteria Pollutants) covers air toxics. The local air districts are also required to implement and enforce NESHAP, MACT, and ATCM standards, as applicable.

The most important rule under Regulation XIV for the conversion technology program is Rule 1401 (New Source Review of Toxic Air Contaminants). It covers all new and modified sources of specific toxic air contaminants (TACs), which are listed in the rule. A Rule 1401 analysis must be performed for all applications for equipment emitting TACs. While the SCAQMD staff performs the analysis on a regular basis, it is often in the best interest of the applicant to conduct the analysis before submitting an application. This gives one the opportunity to modify the project to mitigate any problems identified by the analysis.

It is important to note that Rule 1401 applies to individual pieces of equipment or permit units for which permit applications are submitted. It does not cover facility-wide air toxics emissions.

Four "tiers" of air toxics analyses are performed. In Tier 1, one compares the equipment's emissions of each TAC with annual average and hourly threshold values. If the emissions are below all thresholds, then no further analysis is needed. If the project "fails" Tier 1, then Tier 2 is used. The evaluation consists of plugging project-specific values into formulas published by the SCAQMD. The formulas calculate very conservative estimates of individual cancer risk and non-cancer risk. If the estimates are below the risk criteria, then no further analysis is needed. Tier 3 is similar to Tier 2, except that a screening dispersion model, such as SCREEN3, is used to develop exposure estimates. Finally, if the project "fails" Tier 3, then a detailed health risk assessment, based on full dispersion modeling with local meteorology, must be performed. The detailed HRA includes all exposure pathways, including, skin contact, ingestion, etc. Standard procedures for conducting health risk assessments have been developed by the State of California's Office of Environmental Health Hazard Assessment, and by the SCAQMD.

1.7 Title V

The "Title V" program, named after the portion of the federal Clean Air Act of 1990 that created it, is a national operating permit program for facilities that qualify as "major" sources of criteria pollutants and/or hazardous air pollutants (HAPs). It is a national

program in the sense that it must, at the state and local level, follow guidelines set by the USEPA, and in that Title V permit provisions are federally enforceable. Every eligible facility must obtain a Title V operating permit, which is valid for five years and is renewable. The permit does not create or modify any emission limitations, but it does add record-keeping, monitoring, and public review provisions to those already in conventional permits to operate. The Title V Permitting Program provides for:[29]

- EPA veto authority over permit issuance,
- Greater opportunity for federal and citizen enforcement,
- Enhanced public participation during the permit issuance process,
- Clearer determination of applicable requirements; and
- Improved enforceability of applicable requirements.

The first thing to be determined is whether a facility is eligible for Title V. There are three ways that a conversion technology facility could be determined to be eligible:[30]

- It is a major stationary source (defined below);
- It is subject to a federal New Source Performance Standard (NSPS) that specifically requires obtaining a Title V permit; or
- It is subject to a National Emission Standard for Hazardous Air Pollutants (NESHAP) that specifically requires obtaining a Title V permit.

A facility is a major stationary source if its emissions of certain pollutants exceed thresholds that vary by geographical area.[31] For the South Coast Air Basin, where most of the participating MRFs are likely to be located, the thresholds for potential to emit (PTE)[32] are:[33]

Volatile Organic Compounds	10 tons per year
Nitrogen Oxides	10 tons per year
Sulfur Oxides	100 tons per year
Carbon Monoxide	50 tons per year
PM_{10}	70 tons per year
A Single HAP	10 tons per year
Combination of HAPs	25 tons per year

29 South Coast Air Quality Management District, "Title V Permit Program." (www.aqmd.gov/titlev/index.html) (January 18, 2007).

30 South Coast Air Quality Management District, " *Draft Technical Guidance Document for the Title V Permit Program*, *Version 4.0*, Engineering and Compliance, Diamond Bar, California (March 2005), p.6.

31 The variation is due to differences in attainment of national ambient air quality standards in different regions.

32 PTE was defined in an earlier section.

33 Rule 3001(b), Table 2.

Note that some facilities whose PTE's exceed these thresholds may still be exempt from Title V permitting requirements. Under Rule 3008 (Potential to Emit Limitations), a facility is exempt if its actual emissions are below the following thresholds:[34]

Volatile Organic Compounds	5 tons per year
Nitrogen Oxides	5 tons per year
Sulfur Oxides	50 tons per year
Carbon Monoxide	25 tons per year
PM_{10}	35 tons per year
A Single HAP	5 tons per year
Combination of HAPs	12.5 tons per year

The timing for submittal of a Title V application for a new facility depends upon how the facility becomes eligible. If the MRF proposes to install conversion technology equipment and emissions from the new equipment alone will exceed the PTE thresholds, then an initial Title V permit must be obtained before construction can begin. It is probably advisable to submit the applications for permits to construct and the initial Title V application at the same time. However, if the conversion technology equipment by itself would not result in emissions that exceed the PTE thresholds, but the combination of the existing equipment emissions and the new emissions would exceed them, then an initial Title V application must be submitted within 180 days of meeting Title V applicability criteria. The rules are unclear about when the clock starts running for the 180 days, but a reasonable interpretation is that it begins with issuance of permits to construct for the equipment whose PTE would exceed the thresholds. This is because no emissions are allowed until a permit to construct is issued (at which time the PTC becomes a temporary permit to operate).

Applying for a Title V permit to the South Coast Air Basin is a relatively simple process. The application forms contain lists of all the District rules and regulations, as well as various EPA regulations, that could potentially apply to the facility. The applicant checks off those that are applicable and must sign a statement saying that the facility complies or will comply with all of their provisions. In some cases—and it is our impression that they are rare—the applicant must also prepare a compliance assurance monitoring (CAM) plan that describes how the performance of certain air pollution equipment will be monitored. The criteria for whether a CAM plan is needed are very complex and will not be presented here. However, they need to be reviewed in detail at the project planning stage.

Once a Title V permit is issued, then the permit-holder must set up monitoring and record-keeping systems. Every six months, and annually, the facility must certify that it has complied with all permit conditions and, if it has not, what it has done to achieve compliance. Annual Title V operating permit fees must be paid in addition to fees for non-Title V permits.

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[34] Rule 3008(d)(1); other provisions for exemption are in this rule, but they are not likely to apply to the conversion technologies under consideration.

1.8 Prevention of Significant Deterioration (PSD)

Prevention of Significant Deterioration (PSD) review is a significant Federal program that has been implemented by South Coast Air Quality Management District (SCAQMD) in its series of Rules 1701 through 1713 adopted under Regulation XVII. Sources of air emissions are required to conduct a PSD analysis, including reviews of Best Available Control Technology, ambient air impacts, and additional impacts (effects of air pollution on soils, vegetation and visibility), if they exceed certain thresholds for "regulated NSR pollutants". Depending on the specific source category, the threshold for applicability of PSD review for a new source of air emissions may be 100 tpy or 250 tpy of any given "regulated NSR pollutant" for which the region is in attainment. In SCAQMD, "regulated NSR pollutants" include carbon monoxide, sulfur dioxide, nitrogen oxides, particulate matter, particulate matter of less than ten microns in size, volatile organic compounds, lead compounds, asbestos, beryllium, mercury, vinyl chloride, fluorides, sulfuric acid mist, hydrogen sulfide, total reduced sulfur (including hydrogen sulfide) and reduced sulfur compounds (including hydrogen sulfide). If the threshold for applicability is exceeded, then additional significance thresholds must be analyzed to determine the specific "regulated NSR pollutants" for which PSD reviews must be conducted. These additional significance thresholds are pollutant specific and may range from 0.0004 tpy to 100 tpy.

2.0 Federal New Source Performance Standards

Title 40, Part 60 of the Code of Federal Regulations contains "new source performance standards" (NSPS) for many types of emission sources. Through its Regulation IX, the SCAQMD has adopted all the NSPS promulgated by the U.S. Environmental Protection Agency. In cases where there is a difference in requirement between a federal NSPS and applicable District rules, the District considers the more stringent to be valid.

We have identified an NSPS that could potentially apply to conversion technology systems that include pyrolysis of municipal waste: Standards of Performance for Small Municipal Waste Combustion Units (40 CFR 60, Subpart AAAA).[35]

In the regulation, the term "municipal waste combustion unit" means "any setting or equipment that combusts solid, liquid, or gasified municipal solid waste including … pyrolysis/combustion units."[36] This apparently applies to conversion technologies that create syngas through pyrolysis and then combust it, as in thermal oxidizers or boilers. The NSPS applies to new facilities that "combust" 35 to 250 tons per day of municipal solid waste.[37]

MSW combustion units are divided into two classes, according to their processing capacity. Class I units have a plant-wide combustion capacity exceeding 250 tons per

[35] Promulgated in the *Federal Register* 65:76350-76375 (December 6, 2000).
[36] 40 CFR 60.1465.
[37] 40 CFR 60.1010.

day, while Class II units have a plant-wide combustion capacity less than or equal to 250 tons per day. The only differences in requirements for the two classes are:[38]

- Class I units have emission limits, continuous emissions monitoring, recordkeeping and reporting requirements for NO_x.

- Class II units do not have NO_x monitoring, testing, recordkeeping or reporting requirements.

The following is a brief summary of the provisions of this NSPS that apply to both Class I and Class II units.

- The facility must prepare and hold a public meeting on a "materials separation plan," which consists of a goal and an approach for separating certain components from MSW prior to combustion and making them available for recycling.[39]

- The facility must prepare and hold a public meeting on a "siting analysis," which consists of analysis of how the new municipal solid waste combustion unit affects ambient air quality, visibility, soils, and vegetation. Alternative air pollution control measures must also be discussed.

- Plant operators must receive formal training through a USEPA- or State-approved course.

- The emission limits in Table B must be met.

- Annual reports on operating parameters and emissions must be submitted. If the facility is out of compliance with any part of the NSPS, then information on the out-of-compliance pollutants must be submitted semiannually.

[38] 40 CFR 60.1045(b).
[39] 40 CFR 60.1055.

Table B – Emission Limits Under 40 CFR Part 60 Subpart AAAA[40]

Parameter	Limit
Dioxins/Furans	13 ng/dscm
Cadmium	0.020 mg/dscm
Lead	0.20 mg/dscm
Mercury	0.080 mg/dscm or 85 percent reduction of potential mercury emissions
Opacity	10 percent
Particulate Matter	24 mg/dscm
Hydrogen Chloride	25 ppmv dry or 95 percent reduction of potential hydrogen chloride emissions
Nitrogen Oxides (Class I Units)	150 ppmv dry
Nitrogen Oxides (Class II Units)	500 ppmv dry
Sulfur Dioxide	30 ppmv dry or 80 percent reduction of potential sulfur dioxide emissions
Fugitive Ash	Visible emissions for no more than 5 percent of hourly observational period
Carbon Monoxide	Varies by combustion process (ranges from 50 to 200 ppmv dry)

[40] All emission limits (except opacity) are referenced to 7 percent oxygen. Averaging times for emissions measurement vary by pollutant.

APPENDIX E

HOLLAND & KNIGHT MEMORANDUM:
FUNDING OPPORTUNITIES
DECEMBER 22, 2006

Holland+Knight

Tel 212 513 3200
Fax 212 385 9010

Holland & Knight LLP
195 Broadway
New York, NY 10007-3189
www.hklaw.com

Memorandum

Date: December 22, 2006

To: Alternative Resources, Inc.

From: Holland & Knight LLP

Re: Analysis of Funding Opportunities for Conversion Technology Demonstration Facility - Los Angeles County

Renata Benedini
212 513 3506
renata.benedini@hklaw.com

As part of its efforts to facilitate development of a conversion technology demonstration facility ("Facility"), Los Angeles County is seeking information on potential funding sources. This memorandum summarizes research completed by Holland & Knight ("HK") as part of the Facilitation Contract. Grants and funding opportunities from public sources (Federal and State) as well as the possibility of financing through the issuance of bonds or special appropriations have been investigated. Investigation of private funding sources was also conducted.

Based on research summarized below, there are limited public funding opportunities, both in number of solicitations and amounts of funding available. Although HK and ARI have identified two viable, open solicitations described below, LA County does not at this time have the detailed information required for the application process regarding the demonstration facility, and will not have such information before these solicitations close. However, public funding opportunities are constantly changing, with several recurring solicitations, and should be monitored as LA County's project begins to take shape with a defined site, selected technology, and other established technical, business and financial aspects of the project.

Private activity bonds could be used to finance the Facility. The structure of the bond issuance will depend on whether the government or a private party will own the Facility. Governmental issuers that could issue such bonds are listed in item III below.

Another option for financing the Facility are special appropriations. Although the research indicates that there were few opportunities on the federal level in fiscal year 2006, the fact that some of these opportunities were directed at similar projects being considered by LA County shows that there is a benefit to LA County to begin work as suggested in item IV below to seek a demonstration project to test one of the technologies. The same benefits exist as listed in item IV below for State funding opportunities.

A complete list of the public funding sources researched are compiled into the chart attached to this memorandum as Attachment 1. Attachment 1 lists the funding source, amount of funding available, technology utilized, condition of award and other relevant projects for public sources. Below is a summary of each of the available categories of funding.

I. PUBLIC SOURCES

Research of public funding sources included the Department of Energy, California Energy Commission Public Interest Energy Research, EPA, and CIWMB. Federal and State grant and loan opportunities were researched, including opportunities suggested by Subcommittee members and the LA County Department of Public Works. The research was completed on November 1, 2006 and Attachment 1 presents a snap-shot of the funding sources and opportunities available at the time of the research.

Based on the research, presently there are limited public funding opportunities. Some of the opportunities researched (such as the Defense Department's DARPA Biofuels program, which is limited to crop conversion to biofuel and not waste conversion) were determined not be applicable to LA County's project. Other funding sources have no current solicitations, but should be monitored for future activity, particularly as LA County's project begins to take shape with a defined site, selected technology, and other known technical, business, and financial aspects. For example, California's Biomass Research and Development Initiative has awarded $17.5 million to 17 projects in 2006, and has reportedly appropriated funds for future fiscal years, but there are currently no active solicitations. Also, the California Pollution Control Financing Authority's Sustainable Communities Grant and Loan Program, which is currently pending approval in State legislature, is structured to provide grants and no-interest loans of up to $500,000 per applicant. Because the listed opportunities constantly change, it is recommended that funding opportunities be monitored as the project proceeds. The website www.grants.gov is one of several sites that contain lists of funding opportunities that is frequently updated. Other sources that should be monitored as this project proceeds are identified in Attachment 1.

Among the federal sources listed in Attachment 1, the Advanced Energy Initiative ("AEI"), which falls under the Department of Energy's Loan Guarantee Program, might be one of the more viable opportunities to be monitored and potentially pursued. AEI currently offers up to $2 billion in loan guarantees for up to 80 percent of the project cost of the facility. LA County's project is consistent with the purpose of the AEI program, which is to encourage early commercial use in the U.S. of new or significantly improved technology in energy projects. Eligible technologies must be mature enough to assure dependable commercial operation and must be able to generate sufficient revenue to provide a reasonable prospect of payment of the loan obligation. Projects intended solely to demonstrate feasibility of a technology, on any scale, are not eligible. For LA County's project to be eligible, the technology(ies) selected must be able to operate commercially with sufficient revenue generation to meet the loan obligation.

The current AEI solicitation, which is described on DOE's Loan Guarantee Program website as a "first solicitation", has a pre-application deadline of December 31, 2006. LA County does not yet have the detailed information required for the pre-application process, which includes identification of the technology to be used, estimated project cost and schedule,

identification of project sponsors, and a financing plan that includes a life-cycle financial model (see Attachment 1 for more information on the pre-application procedure). HK has contacted AEI (see contact information listed in Attachment 1) and was informed that, subject to available appropriations to fund guarantees, additional solicitations of this type may be available through AEI in the future as LA County's project becomes more defined with the identification of preferred technologies and sites.

Among the State sources listed in Attachment 1, the California Energy Commission's Public Interest Energy Research ("PIER") Environmental Area Team's Biofuels Research Development & Demonstration program offers a comparably higher level of potential grant funding than other State sources. The total funding available through this solicitation is $3 million, with a maximum $1 million per proposal/project. Eligible projects must produce a transportation fuel (e.g., ethanol, biodiesel), so eligibility of LA County's project will depend on the technology(ies) selected. The deadline for the program's receipt of applications (as set forth in Attachment 1) is January 4, 2007; however, as described above, LA County does not yet have sufficient information to apply under the current solicitation. Applicants must present a team with demonstrated commercialization capability, which requires the County's project to be more defined with identification of preferred technologies and sites. It is recommended that funding opportunities from the Energy Innovation Small Grant Program as well as other Energy Commission funding solicitations be monitored through the PIER website (www.energy.ca.gov/contracts/smallgrant/index.html) as set forth in Attachment 1.

II. PRIVATE SOURCES

Research of private funding sources included several representative venture capital firms, funds, individuals and groups. There are numerous funding opportunities among this group, which appears to be primarily geared towards equity investments in companies. Other private sources are available that provide project equity. As part of the RFI process, the technology suppliers were requested to discuss financing, including if possible, identification of private funding sources. Private funding sources identified by the technology suppliers will be separately evaluated.

III. BONDS

Tax exempt municipal bonds were researched as an option of financing the Facility. Below is a summary:

1. **Government Ownership of the Facility**: Should a governmental entity choose to own the Facility, the development of the Facility may be financed through the issuance of tax exempt bonds. The proceeds of such bonds would be used to fund the construction of the Facility. The governmental entity may issue general obligation or revenue bonds. It is most likely that a California governmental entity would issue revenue bonds. Any operating agreement entered into between the governmental owner of the Facility and a private operator of the Facility would have to meet the requirements of a "qualified management contract" under Federal tax law. Such requirements dictate certain private contractor compensation arrangements and would limit private use of the Facility. Another option that a governmental entity may use when issuing tax-exempt bonds for the construction of a solid waste facility that

will be governmentally owned is private activity bonds. A governmental entity may issue private activity bonds to finance the construction of a solid waste facility so long as the facility is processing solid waste and the facility is governmentally owned. If these two requirements are met, no volume cap is required (as discussed below) and the contract entered into between the governmental owner and a private operator does not have to meet the requirements of a "qualified management contract".

2. **Private Ownership of the Facility**: If the Facility is to be privately owned, its construction may still be financed with tax exempt debt. The debt issued would be private activity bonds. Because the Facility would be privately owned, however, the project would have to receive an allocation of volume cap. Each State has a certain allocation of volume cap which regulates the volume of private activity bonds that may be issued within the State. In California, volume cap allocation is administered by the California Debt Limit Allocation Commission. Any such private activity bonds issued to finance the construction of the Facility would be issued by a conduit issuer and secured entirely by the Facility as well as the credit of the private owner.

3. **Potential Issuers**: LA County may consider the following agencies for issuance of the bonds: i) LA County Public Works Authority (issues revenue bonds); ii) joint powers authority issuers, including California Statewide Communities Development Authority (issue bonds the proceeds of which are lent to private parties); iii) on the state-wide level, the California Pollution Control Authority and the California Infrastructure Bank (both issue bonds for projects such as that proposed by LA County).

The DPC data website (www.dpcdata.com) lists various examples of bonds issued in connection with solid waste projects in the past years. Some of the listed examples include the California Pollution Control Financing Authority's $30 million issuance in connection with their Republic Services Inc. project in March 2006 and the California Statewide Community Development Authority Solid Waste Revenue Bonds in the amount of $25 million in February 2003.

IV. SPECIAL APPROPRIATIONS

The Facility could be financed by special appropriations, either on a federal level or on a local level. Below is a summary:

1. Federal. Fiscal year 2006 appropriations conference reports were reviewed for earmarks related to municipal landfill/recycling projects. Although the opportunities are not numerous, a few were directed towards biomass projects in both the Energy and Water appropriations bill (DOE budget) and the Interior appropriations bill (EPA budget). These would appear relevant to one or more of the technologies being considered by LA County (including, for example, Changing World Technologies and Arrow Ecology). Attached, as Attachments 2 and 3, are the fiscal year 2006 Energy and Water Conference Report and Interior Conference Reports. Below are the earmarks excerpted from the reports which seem most relevant:

FY06 Energy and Water Conference Report
"Madison County Landfill Gas to Energy Project…….$1,000,000"
"Solid Waste Authority Pyramid Resource Center……$2,000,000"
"City of Stamford Waste-to-Energy Project……. $1,500,000"

FY06 Interior Conference Report
"Waste to Energy project in Stamford, Connecticut…….$250,000"
"Hawaii Island Economic Development Board's Big Island Recycle program……..$500,000"

Success in finding viable funding is driven by a number of factors, not the least of which are how many other requests LA County has in each bill, how much funding is provided to the fiscal year 2008 accounts, local matching funding, as well as other factors. LA County could partner with surrounding jurisdictions to seek a demonstration project to test one of the technologies; such a proposal would receive strong consideration from both the California senators and the LA House delegation.

In terms of process, this would be Congressionally directed funding so there would be no formal agency application process or deadlines outside of the Congressional appropriations process. If successful, the recipient (most likely LA County) would need to complete Department of Energy and Environmental Protection Agency applications and documentation before funds would be released.

2. State. Preliminary research has been conducted on the feasibility of special appropriations in Sacramento. Although energy cogeneration is not currently as topical as it was a few years ago when initiatives such as the Green Wave Initiative launched by Treasurer Angelides (see Attachment 1), LA County can begin work now to secure legislation that would be helpful in the future. LA County can work towards joining or helping build a coalition that would legislatively address energy cogeneration and to promote a bill or an amendment in the budget. LA County efforts to promote such bill could involve any of the following approaches: i) direct funding for a project either through one of the existing funds (an approach that has been undertaken for diesel) or as a demonstration project; ii) require contractors to permit LA County to co-locate an electrical generation facility in conjunction with the waste site (attracting an investing entity that shares the risk and the energy); iii) reward local governments with state financial protection if an alternative generation facility were sited on an existing or new site or provide for revenue bonding for sites. Although each of the above approaches or some combination thereof could attract a legislative supporter for the bill options i) and iii) seem to be the most applicable to the proposed Facility.

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Federal Funding Source	Funding/ Amount Available	Technology/ Applicability	Conditions of Award	Additional Relevant Info
1) Advanced Energy Initiative – Department of Energy's Loan Guarantee Office allows for project funding under Title XVII of the Energy Policy Act of 2005. [client source]	• Up to $2 Billion in loan guarantees • The loan guarantee cannot exceed an amount equal to 80 percent of the project cost of the facility that is the subject of the guarantee as estimated at the time at which the guarantee is issued (Title XVII; Section 1702(c)).	• Advanced fossil energy technology (those that gasify coal, biomass, or petroleum coke in any amount to produce synthesis gas for use as a fuel or feedstock and for which electricity amounts for less than 65 percent of the useful energy output of the facility). • Carbon sequestration practices and technologies, including agricultural and forestry practices that store and sequester carbon (Title XVII; SEC. 1703(b)). • Section 1702(d) requires "a reasonable prospect of payment" of any loan or debt obligation issued to a project, technologies for project proposals should be mature enough to assure dependable commercial operations and generate sufficient revenues, **and not solely a demonstration project** (i.e., a project designated to demonstrate feasibility of a technology on any scale). • Eligible if the County's conversion technology "demonstration project" is pursued on a commercial basis rather than as a demonstration project. County's program is consistent with the purpose of this loan guarantee program, which is to encourage early commercial use in the US or new or significantly improved technologies in energy projects.	Eligible projects: • Avoid, reduce or sequester air pollutants or anthropogenic emissions of greenhouse gases • Employ new or significantly improved technologies as compared to commercial technologies currently in service in the U.S. (Title XVII; SEC.1703(a)) • Integrated gasification combined cycle plants meeting the emission levels: including projects for the generation of electricity, where electricity will account for at least 65 percent of net useful annual energy output. • Industrial gasification projects - facilities that gasify coal, biomass, or petroleum coke in any combination to produce synthesis gas for use as a fuel or feedstock and for which electricity accounts for less than 65 percent of the useful energy output of the facility. • No guarantee shall be made unless the Secretary determines that the amount of the obligation (when combined with amounts available to the borrower from other sources) will be sufficient to carry out the project (Title XVII; SEC.1702(d)).	• *Submission:* Pre-Applications are required to be submitted electronically through DOE's Industry Interactive Procurement System (IIPS): http://e-center.doe.gov. • *Deadline for Receipt of Applications:* Pre-Application due date: December 31, 2006. • DOE's Loan Guarantee Program can be found at: www.lgprogram.energy.gov/keydocs.html • Dan Tobin: (202) 586-1940 • The term of an obligation requires full repayment over a period not to exceed the lesser of 1) 30 years; or 2) 90 percent of the projected useful life of the physical asset to be financed by the obligation (Title XVII; SEC.1702(f)). • This is a "first solicitation." The only project proposals that DOE will consider in connection with the first Solicitation must employ a technology that fits within one of AEI's categories. After adopting final regulations, DOE intends to issue additional solicitations covering the full range of eligible projects under Title XVII, pending approval in Congress (appropriations). • Pre-Applications must be typed, single-spaced, must not exceed a total page limit of 100 pages for the entire Pre-Application submission, including all attachments, charts, graphs, etc. • Pre-applications should contains the following information and documentation: a completed pre-application form signed by an individual with full authority to bind the project sponsor; a business plan including an overview of the proposed project including: a description of the project sponsors (including their experience in project investment, development, construction, operation and maintenance), description of technology to be utilized (including its commercial applications and social uses, owners or controllers of the intellectual property incorporated in and utilized by the technology and its manufacturers and licensees), estimated amount of total project cost, timeframe required for construction and commissioning of the facility, and description of the primary off-take or revenue-generating agreement that will primarily provide financial support for the project; financing plan overview describing the amount of equity to be invested and the sources of such equity, amount of total debt obligations to be incurred and the funding sources of all such debt, anticipated guarantee percentage of the Government-guaranteed debt, and a financial model detailing the investments and cash flows generated from the project over the project life-cycle; explanation of what impact the loan guarantee will have on the interest rate, debt term, and overall financing structure for the project; copy of commitment letter from an eligible lender expressing its commitment to provide the required debt financing necessary to construct and fully commission the project subject to commercially reasonable conditions governing disbursement

Federal Funding Source	Funding/ Amount Available	Technology/ Applicability	Conditions of Award	Additional Relevant Info
				commonly included in arm's length debt financing arrangements for projects and loan amounts similar to the proposed project; copy of equity commitment letter(s) from each of the project sponsors and a description of the sources for such equity; overview of how the project will comply with the eligibility requirements under Section 1703 of the Act; outline of potential environmental impacts of the project and how these impacts will be mitigated; description of the anticipated air pollution and greenhouse gas reduction benefits; description of how the proposed project advances the President's Advanced Energy Initiative; and executive summary briefly encapsulating the key project features and attributes. • In IIPS, the overall proposal shall consist of 3 volumes, individually entitled as stated below. Each volume will be submitted as a separate file. Multiple electronic files may be submitted for each volume; however, each file must clearly identify the volume with which it is associated. Volume I: Offeror & Other Documents; Volume II: Technical; Volume III: Cost/Price. • Upon a favorable review of a Pre-Application by the Credit Review Board, DOE will issue a written invitation to submit an Application for a Loan Guarantee.
2) DARPA Biofuels [client source]	The Government may incrementally fund any award issued under this BAA; proposed costs should be reasonable and realistic for the technical and management approach offered; no specific funding amount stated	• Conversion efficiency, by energy content, of crop oil to JP-8 surrogate and elucidate a path to 90% conversion. • Current biodiesel alternative fuels are produced by transesterification of triglycerides extracted from agricultural crop oils. This process, while highly efficient, yields a blend of methyl esters that is 25% lower in energy density than JP-8 and exhibits unacceptable cold-flow features at the lower extreme of the required JP-8 operating regime. • Potential approaches may include thermal, catalytic, or enzymatic technologies or combinations of these. • This solicitation does not apply to the project because solicitation is limited to crop conversion (and not waste conversion).	Eligible Projects: • Proposals for research and development efforts to develop a process that efficiently produces a surrogate for petroleum based military jet fuel (JP-8) form oil-rich crops produced by either agricultare or aquaculture. • Proposals are encouraged to consider process paths that minimize the use of external energy sources, which are adaptable to a range or blend of feedstock crop oils, and which produce process by-products that have ancillary manufacturing or industrial value.	• *Submission:* DARPA, 3701 North Fairfax Drive, Arlington, VA 22203-1714 • *Deadline for Receipt of Applications*: September 19, 2006 for initial round of funding. The opportunity shall remain open for one (1) year from the date of publication on www.fbo.gov and www.grants.gov. • Website: www.darpa.mil/ato/solicit/biofuels/index.htm

Federal Funding Source	Funding/ Amount Available	Technology/ Applicability	Conditions of Award	Additional Relevant Info
3) Biomass Research & Development Initiative [client source]	• $5,000,000 for fiscal year 2002 • $14,000,000 for each of fiscal years 2003 through 2007, to remain available until expended • $200,000,000 appropriated for each fiscal years 2006 through 2015	• Overcoming recalcitrance of cellulosic biomass through developing technologies for converting cellulosic biomass into intermediaries that can subsequently be converted into biobased fuels and biobased products including: • Pretreatment in combination with enzymatic or microbial hydrolysis • Thermo chemical approaches, including gasification/ pyrolysis APPLICABLE to County's project because the conversion technologies being considered convert cellulosic biomass into intermediaries, which can be converted into biobased fuels and products. This initiative is a good source for later review and to contact to see if there are any current funding opportunities. There is currently not a funding opportunity available.	Eligible Projects: • The Secretary of Agriculture and the Secretary of Energy, in consultation with the Administrator of the E.P.A. shall direct research and development toward: • Analysis that provides strategic guidance for the application of biomass technologies in accordance with realization of improved sustainability and environmental quality, usually featuring system-wide approaches.	Eligible Entities: 1. an institution of higher education 2. a National Laboratory 3. Federal research agency 4. a State research agency 5. a private sector entity 6. a nonprofit organization 7. a consortium of 2 more entities described in paragraphs (1) through (6) • Website: www.biomass.govtools.us/about.asp
4) Renewable Energy Systems & Energy Efficiency Improvements program – U.S. Department of Energy, Energy Efficiency and Renewable Energy [client source]	• Estimated fiscal year 2006 budget for the Golden Field Office's personnel and projects is $280 million.	County's project is consistent with the program's initiative This initiative is a good source for later review and to contact to see if there are any current funding opportunities. There is currently not a funding opportunity available.	Eligible projects: • Strengthen America's energy security, environmental quality, and economic vitality in public-private partnerships that: • enhance energy and efficiency and productivity • bring clean, reliable and affordable energy technologies to the marketplace • Make a difference in everyday lives of Americans by enhancing their energy choices and their quality of life.	• *Submission:* Applications are posted and submitted online at www.grants.gov/ • *Additional information*: Golden Field Office: (303) 275-4700 www.eere.energy.gov/golden/ • Funding distributed to: 1. private firms 2. educational institutions 3. nonprofit organizations 4. state and local governments 5. Native American organizations 6. individuals through competitive solicitations.

Federal Funding Source	Funding/ Amount Available	Technology/ Applicability	Conditions of Award	Additional Relevant Info
5) Western Regional Biomass Energy Program [client source]	• Funding for fiscal year 2001 was $300,000. • Typical funding was $50,000 per project with $75,000 or more allocated for exceptional projects.	County's project is consistent with requirements for the program; it is a demonstration project for a conversion technology to increase the production of biomass energy resources. This initiative is a good source for later review and to contact to see if there are any current funding opportunities. There is currently not a funding opportunity available.	Eligible projects: • This program funds research programs of direct interest to California's conversion technology program. • Goal is to increase the production and use of biomass energy resources for economic development and environmental sustainability. • Biomass is defined as renewable organic materials, such as forestry and agricultural crops and residues; wood and food processing wastes; and municipal solid waste.	• *Submission:* Application is posted at www.grants.gov/ or contact: Gayle F. Gordon Western Governors' Association 1515 Cleveland Place, Suite 200 Denver, CO 80202 (303) 623-9378 EXT. 109 ggordon@westgov.org • Website: www.westgov.org/wga/initiatives/biomass • Applicants: 1. profit organizations 2. private nonprofit institutions/organizations 3. intrastate, interstate, state and local government agencies 4. universities • August 16, 2006; Denver, Co.; Western Governors supported Xcel Energy on its plans to develop an Integrated Gasification Combined Cycle facility in Colorado that will produce cleaner energy while capturing carbon dioxide and preventing it from entering the atmosphere; IGCC power plants turn fossil fuel into a clean-burning gas, which is then used by a turbine to generate electricity
6) Office of Industrial Technologies –- U.S. Department of Energy, Energy Efficiency and Renewable Energy Inventions & Innovation [client source]	• Up to $50,000 for technologies in early-stage development • Up to $250,000 for technologies approaching the point of prototype.	Applicable to technology, but not applicant because applicant must be a small business or individual inventor and must be responsible for conducting majority of work described in the proposal. The County can not be the applicant for this funding source. It is possible that one or more of the technology suppliers could meet the applicant requirements, depending on teaming arrangements.	Eligible projects: • Technologies that offer significant energy savings and future commercial market potential are eligible for I&I support. • develop and deliver advanced energy efficiency • renewable energy • pollution prevention technologies for application in the U.S. industrial sector. • I & I provides financial assistance for research and development of innovative, energy-saving ideas and inventions. • Goal: improve resource efficiency and competitiveness of materials and process industries.	• There are no current proposal openings at this time; the last open date was 1/10/06 which closed 1/31/06 • Once or twice a year, I&I releases an "announcement of funding opportunity" • Must respond to an I&I announcement of funding opportunity when it is released (1-2 times a year). • Pre-Application Self Assessment Tool available online: http://www.eere.energy.gov/inventions/financial_propqa.html Applicant must be: 1. Individuals that are U.S. citizens 2. Small businesses that are U.S. owned • Website: www.eere.energy.gov/inventions/ • Virent Energy Systems, LLC; Verona, WI; This project addresses the feasibility of generating medium to high-energy content fuel gas from biomass-derived carbohydrates utilizing a novel low-temperature aqueous-phase reforming process. This novel process would allow a new route for renewable fuel gas generation utilizing aqueous-phase carbohydrates extracted from low cost biomass waste.

Federal Funding Source	Funding/ Amount Available	Technology/ Applicability	Conditions of Award	Additional Relevant Info
7) Oswer Innovations Pilot Projects - Environmental Protection Agency (EPA) [client source]	• The total estimated funding available under this competitive opportunity is $500,000 • EPA anticipates award of 5-10 assistance agreements resulting from this competitive opportunity, which shall not exceed $100,000 Average funding per project in the past has been $47,000.	• All projects must be directly related to solid waste (including products and materials), hazardous substances in the environment, and must be an innovative and collaborative approach to at least one of the OSWER priority areas defined in Section 1 of the announcement (http://www.epa.gov/oswer/docs/grants/06-08.pdf) • The project is eligible to the technology it is using if owned and operated by a private entity, however, the organizations proposing to utilize propriety information must provide evidence of permission to use the information per Sophia Lo, Innovation, Partnerships, & Communication Office U.S. EPA • Applicable based on information. No current solicitation. • EPA awards funds to one eligible applicant as the "recipient" even if other eligible applicants are named as "partners" or "co-applicants" or members of a "coalition" or "consortium." Funding may be used to acquire services or fund partnerships. For profit organizations are not eligible for subawards or subgrants under this announcement but may enter into procurement contracts with recipients. Applicants are not required to identify contractors or consultants in their proposal.	Eligible Projects: • Short term (one or two year) projects that produce results and are ready for "real world practical application in a short time period • Innovative projects that: broaden the array of environmental tools; foster long-term business process changes in the private sector; promote a significant policy shift or culture change in the public sector; or adapt an existing tool or idea in a different sector/geographic area • Projects supporting sustainable and beneficial reuse of sites through material reuse, energy efficient design, and renewable energy use • Demonstrations are eligible; "demonstration" being defined as the first instance of the application or an innovative application of a previously used method	• *Submission:* Applications submitted through www.grants.gov must be received by Grants.gov • *Deadline for Receipt of Applications:* **November 20, 2006, 5:00 p.m. EST (this deadline has passed)** • Future OSWER grant and other funding opportunities will be posted as they become available. • Eligible entities include: 1. States, 2. Territories 3. Public and private universities 4. Interstate & Intrastate organizations 5. Local agencies • IWG project funds are not available for "for-profit" companies, organizations, or private individuals • Urban Waste to Fuel Initiative awarded $75,000; Project collects local waste oil and processes it into biodiesel for distribution and sale to local public sector; Partners include Santa Cruz Public Works, Bio-Energy Systems, S.C. Metropolitan Trans. District • Small Scale Anaerobic Digester awarded $65,000; Project will develop, test, and replicate a small scale anaerobic digestion facility for on-site installation at concentrated urban food waste sources and explore emerging renewable energy applications

Federal Funding Source	Funding/ Amount Available	Technology/ Applicability	Conditions of Award	Additional Relevant Info
8) Solid Waste Management Assistance Grant – U.S. Environmental Protection Agency, Region 9	• $20K-$50K • Approximately $120,000 in cooperative agreements (grants) this year for Region 9 Resource Conservation Funds; EPA Region 9 will grant between 4 and 7 cooperative agreements ranging in size from $20,000-$50,000; additional $100,000 will be available for Tribal Solid Waste Projects.	Grant program is applicable. No active solicitation at the moment. Future solicitation round is expected in early 2007.	Eligible projects: • Projects that "demonstrate applications, technologies, methods or approaches that are new, innovative or experimental. A project that is carried out through a routine or established practice is not a demonstration." • Reducing the generation and disposal of the following materials and waste streams through reuse, recycling, composting, or market development: construction and demolition debris, green waste and the organic portion of the waste stream. • Targets demonstration.	• *Submissions:* www.epa.gov/epaoswer/osw • *Deadline for Receipt of Applications:* deadlines have passed. March 27, 2006 Initial proposals due May 18, 2006 Application & work plan due • October 2006 Awards made • **Next round solicitation: early 2007** • Phone 202-260-9266 Applicant eligibility: • Proposals will be accepted from States, Indian Tribes, interstate, intrastate and local government agencies and instrumentalities; and non-profit organizations, educational institutions and hospitals • For profit organizations and individuals who are applying on behalf of for profits organizations are not eligible • Must meet both project and applicant eligibility requirements
9) Solid Waste Environmental Program – North American Development Bank	• $500,000 maximum per community; to promote regional facilities with higher construction and operational efficiencies, multiple eligible communities may pool their grant awards towards the construction of a single shared facility with $1.5 million limit • Funds may be used to finance up to 50% of total	• Most likely not eligible, the distance to the border exceeds the maximum amount allotted by the program.	Eligible Projects: • Projects must be sponsored by a public entity, located within 100 kilometers (62 miles) of the U.S. -Mexico border, and certified by BECC to be eligible for SWEP support • Projects funded by private entities may be eligible if co-sponsored by a public entity • All projects must include measures to increase and strengthen their environmental, financial and operational sustainability • Specific projects priorities will be reviewed in conjunction with federal, state, and local	• *Submission:* Jorge C. Garcés 203 South St. Mary's, Suite 300 San Antonio, Texas 78205 • *Deadline for Receipt of Applications:* none specified. • Website: www.nadbank.org • Telephone: (210) 231-8000 • Fax: (210) 231- 6232

Federal Funding Source	Funding/ Amount Available	Technology/ Applicability	Conditions of Award	Additional Relevant Info
	cost		authorities; preference will be given to existing projects that have completed final design and where co-financing partners have already been identified but additional financial support is still required	

State Funding Source	Funding/ Amount Available	Technology/ Applicability	Conditions of Award	Additional Relevant Info
1) Environmental Exploratory Grant Program – California's Energy Commission's Public Interest Energy Research (PIER) Environmental Area Team [client source]	Maximum amount of any individual grant award is $75,000; Approximately $600,000 of PIER funds will be allocated to EEGP grants.	Project may be eligible as air quality project or global climate change project. Program is research oriented. Possible future funding opportunity for research study after project is constructed and operational.	Eligible projects: • Land-Use and Habitat Aquatic Resource • Air Quality • Global Climate Change (Optimization of Distributed networks to reduce GHG Emissions of Climatic Tolerance Advancement in California's Energy Technologies). Research projects that have already been funded or are planned for funding are restricted from EEGP awards and will not be considered under the EEGP program, in order to prevent the same proposal from being submitted to multiple programs within PIER.	• *Electronic Submission (Preferred):* Explore2006@ucop.edu • *Hard-copy Submission:* PIER-EA EEGP Administrator California Institute for Energy and Environment University of California, Office of the President 1333 Broadway, Suite 240 Oakland, CA 94612-1918. • *Deadline for Receipt of Applications:* **October 10, 2006; 5:00 PM Pacific Time** • PIER program is made up of: Building End-Use Efficiency, Industrial Agricultural/ Water End Use Energy Efficiency, Renewable Energy Technologies, Environmentally-Preferred Advanced Generation, Energy Systems Integration, and Energy Related Environmental Research.
2) Energy Innovations Small Grant Program - California's Energy Commission's Public Interest Energy Research (PIER) Environmental Area Team	• Provides up to $95,000 for hardware projects and $50,000 for modeling projects to small businesses, non-profits, individuals and academic institutions to conduct research that establishes new, innovative energy concepts	• Renewable energy sources include solar radiation, geothermal fluids, biomass, water, and wind available for conversion to energy. • Technology applications include, but are not limited to: hydropower; geothermal energy; and biomass energy. • Renewable technologies hybridized with fossil-fuel fired energy are acceptable within the definition of renewable energy. • Renewable energy	Eligible projects (must meet all criteria): • The proposed work must advance science or technology not adequately addressed by competitive and regulated markets • Propose an original innovation solution to a significant energy problem • Propose work that is still in the proof-of-concept phase Address a California market need • Provide a clear potential benefit to California electricity ratepayers • The proposals that are the most competitive are those that speak with clarity and focus and: 1. Will establish the feasibility of concepts of designed to advance energy and science and/or technology beneficial to California's electric ratepayers 2. identify the research gaps that make the project necessary 3. Describe the research tasks required to complete the project and identify all related performance objectives associated with each task	• *Hard-copy Submission:* EISG Program Administrator San Diego State University Foundation 5250 Campanile Drive, MC 1858 San Diego, CA 92182-1858 • *Electronic Submission:* www.energy.ca.gov/contracts/smallgrant/index.html • ***Deadline for Receipt of Applications:*** **October 13, 2006** • Commission Approval of Awards: Approx 20 weeks from cutoff date • *Begin Executing Agreements:* Feb. 2007 • Website: www.energy.ca.gov/contracts/smallgrant/index.html • Telephone: (619) 594- 1049 • Fax: (619) 594-0996 • E-Mail: eisgp@energy.state.ca.us • Project likely eligible per Dave Michel, Program Manager, Energy Innovations Small Grant Program • The website notes that you can sign up for email notification of future solicitation from EISG or all Energy Commission funding solicitations.

State Funding Source	Funding/ Amount Available	Technology/ Applicability	Conditions of Award	Additional Relevant Info
		can provide public benefits such as energy price security, improved environmental quality, increased benefits to local and regional economies, improved management of natural resources through the use of indigenous energy resources, and protection of public health and safety. Applicants are restricted to individuals, small businesses, non-profit organizations and academic institutions. There are up to four solicitations per year. When a solicitation notice expires, the next solicitation will generally be posted **within 30-60 days.**		County should monitor the solicitations.
3) Biofuels Research Development & Demonstration- California's Energy Commission's Public Interest Energy Research (PIER)	• The total funding available through this solicitation is $3 million. • Three to four projects will be selected, which will be awarded as grants • Maximum amount	Eligible for some of the technologies the County is considering. The final product must be a transportation fuel (e.g., ethanol, biodiesel) with co-generation of other value-added products.	Eligible Projects: • Promising biofuel technologies that can either utilize thermochemical, biochemical, and physicochemical (mechanical and chemical extraction) conversion routes or combination of two or more of these routes will be considered for this competitive grant solicitation • Proposed biofuel conversion technologies should utilize California's lignocellulosic biomass resources including residues from agriculture, forestry and	• *Submission*: California Energy Commission, Grants and Loans Office, Attn: PIER-Biofuels Grant Program, 1516 Ninth Street, MS-1 Sacramento, CA 95814 • *Deadline for Receipt of Application*: January 4, 2007; 4:00 p.m. (PST) • Phone: (916) 651- 9312 • Eligible Applicants: • Applicants must present a team with a demonstrated commercialization capability (i.e. bringing large complex systems/products to market) • Both private and public entities may apply under this solicitation

State Funding Source	Funding/ Amount Available	Technology/ Applicability	Conditions of Award	Additional Relevant Info
Environmental Area Team [client source]	that may be requested for a single proposal is $1 million in PIER funding • No minimum match share requirement, but the share of match funding will be considered in scoring the proposal		municipal waste stream (food processing waste, waste beverages, waste grease), and purpose-grown or energy crops • Improving the cost competitiveness and affordability of biofuel conversion technologies • Assuring likelihood of success and market connectedness • Improving performance of biofuel conversion systems and refineries to process biomass resources that enhance environmental and public health benefits	• Website: www.energy.ca.gov/contracts/index.html • Copies of solicitation documents and information can be obtained by contacting: California Energy Commission, 1516 Ninth Street, MS-43, Sacramento, CA 95814 • Pre-proposal workshop via WebEx on December 1, 2006 between 10 A.M. and 12 P.M. Application requirements: Cover Page including Project Title, Solicitation Number, requested Grant Funding, Contact information, including contact person's name, title, entity name, physical address, telephone number, fax number and email address; Abstract/summary of the project (one page maximum), which includes the title; brief project description; the energy problem being addressed by the proposal; quantitative and measurable goals to be achieved by the end of the project; the project duration and date of completion; amount of PIER-NG funding requested; and total project budget; Current status of the research in the area of your project, barriers to advancement of the technology and why your project is the next logical step to advance the state-of-the-art of the technology or increase the penetration of the technology in the marketplace. Compare existing and proposed processes and show differences (cost, performance, efficiency, reliability, etc.); A Statement whether or not the proposed project leads to a reduction of criteria pollutants (e.g., NOx, CO, SOx). The proposal must discuss how the proposed system meets the latest California Air Resources Board (CARB) standards (including the 2007 standards), or explain why this system is exempt from meeting these standards; Description of targets, quantified technical and economic goals and market application. Explain the target market and the size of the market where this application can be replicated. Identify who would adopt, benefit, manufacture, sell or buy the resulting technology if successful. Include a discussion of the barriers to technology advancement; A Work Statement with a task-by-task description of your project including a process flow diagram. For each task, include a one-sentence goal, a list of the activities to be performed, product(s) produced, deliverables and the duration of the task; Describe anticipated direct and indirect potential impacts and benefits to the host site, California natural gas consumers (in terms of quantified savings due to reduced cost, consumption, emissions, increased reliability, etc.) and to the State of California (savings for energy, cost, etc.), if the project is successful; Short biographies for the Principal Investigator and key research partners (individuals in your organization or subcontractors), emphasizing experience related to activities to be performed under this project; Show project collaboration and coordination, including the pathway to wider use and commercialization of this technology, and financial capability to carry out this project; A discussion/explanation of how the proposed project addresses each of the

State Funding Source	Funding/ Amount Available	Technology/ Applicability	Conditions of Award	Additional Relevant Info
				scoring criteria; Project budget information, including the source(s) of match funding, a justification for the share of match funding, and the reasons why this project is not likely to be funded by competitive or regulated markets. Include the form in Attachment B: PIER-NG funding for each task detailed by category on the first page, match funding for each task detailed by category on the second page, and summary task budget on the third page. This budget form is an Excel spreadsheet. It will be posted on the Energy Commission website at http://www.energy.ca.gov/contracts/index.html as part of this solicitation package; Any other significant factors to enhance the value of the proposal, including highlights of the previous work and innovative features related to the proposed project.
4) Solid Waste Disposal and Codisposal Site Cleanup Program Matching Grants to Public Entities to Abate Solid Waste Disposal Sites Grant – CA Integrated Waste Management Board **(CIWMB)** [client source]	The Program provides financial assistance in the form of reimbursement grants of up to $750,000 in matching funds for eligible costs; applicants may request up to 50 percent of the costs determined by the Board to be eligible and necessary; program staff shall work with Applicant to determine eligible and ineligible costs.	No current solicitation. Not applicable because this program is for landfill remediation and site restoration, and not applicable to County's project.	Eligible projects: • Grants funds are intended to be used to abate threats to public health and safety and/or the environment by funding solid waste • Eligible activities are typical to remediation activities at solid waste disposal and codisposal sites • Grants are available to public entities including counties, cities, districts, and State agencies for site cleanup needed to protect public health and safety and/or the environment • Applicants must provide adequate documentation of financial need for assistance and show evidence of ability to pay for their matching share costs and costs that are ineligible and or that exceed the maximum grant amount	• *Hard-copy Submission (one original and three copies):* California Integrated Waste Management Board Grants Administration Unit (MS-10) P.O. Box 4025 Sacramento, California 95812-4025 • *Deadline for Receipt of Applications:* accepted on a continuous basis up to the last Cycle deadline: • *Cycle number 2:* deadline postmarked no later than January 19, 2006; tentative award date March 2006 Board Meeting • *Cycle number 3:* deadline postmarked no later than March 16, 2006; tentative award date May2006 Board Meeting • Website: http://www.ciwmb.ca.gov/LEACentral /GrantsLoans/ SolidWaste/ • For further information: (916) 341-6000
5) CA Integrated Waste Management Board (CIWMB) [client source]		Project is applicable for funding from CIWMB. No specific funding opportunity is listed. Once project specifics are determined, County should follow up with CIWMB,		• At its 9/12/06 meeting, the waste board approved $200,000 towards a pilot anaerobic digestion facility. • Fernando Berton is a good source/contact for follow up.

State Funding Source	Funding/ Amount Available	Technology/ Applicability	Conditions of Award	Additional Relevant Info

6) Sustainable Communities Grant & Loan Program - California Pollution Control Financing Authority	• Maximum assistance of $500,000 per Applicant
	• Up to $350,000 for a Grant
	• Up to $150,000 for a Loan
	• Maximum Loan term of 60 months at 0% interest rate
		Program is currently pending in legislature.
		These funds are designated for any county, city and county, or city as opposed to a privately owned project/facility.
			Eligible Projects:
			• Projects must assist with the development and implementation of policies, programs, and projects that reduce pollution hazards and the degradation of the environment within existing neighborhoods and communities
			• Assist with revitalization of one or more Economically Distressed California neighborhoods
			• Promote Infill Development
			
			Applicant Eligibility:
			• Applicant must be one or more California cities and or/ counties
			• Applicant may submit only one application for program funds
				• *Submission:* Application instructions will be made available upon receipt of funding authorization
				• *Deadline for Receipt of Applications:* Program currently pending approval in state legislature, no deadline set
				• For additional information:
				California Pollution Control Financing Authority
				915 Capitol Mall, Room 457
				Sacramento, CA 95814
				• Website:
				www.treasurer.ca.gov/CPCFA/cpcfa.htm
				• Projects must:
				  • Develop and implement policies, programs and projects that reduce pollution hazards and the degradation of the environment
				  • Promote land uses that support alternative transportation options
				  • Protect environmental resources
				Pending approval in state legislature. County should monitor this opportunity.

7) Green Wave Initiative- Launched by California State Treasurer Phil Angelides	• California Public Employee's Retirement System (CalPERS) has committed an initial investment of up to $200 million in environmental technology such as renewable energy, fuel cells, and waste recycling with approval of an innovative clean technologies investment program (as of 3/15/04) • California State		The Treasurer's Green Wave initiative calls on CalPERS and CalSTRS (C&C) to implement the following four pronged plan: • Demand Environmental Accountability and Disclosure- C&C would encourage companies through dialogue, shareholder resolutions, and other actions- to improve environmental operations and reduce risks and liabilities • Target Private Investment in Environmental Technologies- urge C&C to invest a combined $500 million in private equity investments, venture capital and project financing to develop "clean" technologies that can provide pension funds with positive, long term returns and can create jobs and economic growth in future • Invest in Stocks of Environmentally Responsible Companies-urge C&C to invest a combined $1 billion of their stock portfolios into environmentally screened funds though active public equity investment managers with proven track record • Audit real estate portfolios to boost long term value-	• *Address information:* 915 Capitol Mall, Room 110 Sacramento, CA 95814 • *Contact:* Mitchel Benson: (916) 653- 4052 Website: www.treasurer.ca.gov Fax: (916) 653-3125 Phone: (916) 653- 2995 • No current solicitation.

State Funding Source	Funding/ Amount Available	Technology/ Applicability	Conditions of Award	Additional Relevant Info
	Teachers' Retirement System (CalSTRS) approved the Treasurer's clean technology investment proposal, committing an initial investment of up to $250 million in clean energy and technology sectors (as of 6/02/04)		Call on C&C to have a thorough audit of their respective real estate investments to determine whether these investments are maximizing their opportunities to use clean energy, energy efficiency and green building standards	

8) California Clean Energy Fund	• The California Clean Energy fund, which was founded in 2004, will make equity investments totaling at least $30 million in emerging clean energy technology companies
	• Calcef is a non-profit company entity that will make for profit investments in commercially viable companies
		This program is not applicable to the County's project. The focus of Calcef is to fund equity opportunities in regards to companies, and not individual projects per Dan Adler, Director of Technology and Policy Development, California Clean Energy Fund.	• The California Energy Action Plan establishes a loading order to guide the state in meeting future needs and is as follows:
			  • Energy efficiency
			  • Renewable energy
			  • Clean fossil fired DG
			  • Clean large-scale generation
			• Calcef has a particular interest in the areas of clean energy innovation in which California has an established advantage, such as renewable generation, demand-side management and information technologies. All forms of power are considered: stationary as well as transportation, demand and supply side.
			• Calcef is interested in the transformational technologies that represent significant advances beyond what is presently in the market
				• *Submission:*
				California Clean Energy Fund (CalCEF)
				582 Market St., Suite 1015
				San Francisco, CA 94104
				• *On-line submissions can be e-mailed to:*
				proposals@calcef.org
				• *Deadline for Receipt of Applications:*
				No specific deadline mentioned
				• Include a brief summary of your company and products in the body of the e-mail, including current stage of operation (startup, revenue generating, profitable) which should be no more than a few paragraphs
				• Attach an executive summary of your proposal- including thorough biographies of current management
				• Telephone: (415) 986 4590
				• Fax: (415) 986 4591
				E-mail for general info: info@calcef.org

State Funding Source	Funding/ Amount Available	Technology/ Applicability	Conditions of Award	Additional Relevant Info
9) California Energy Commission: Energy Efficiency Financing Program	• Up to $40 million is available. Loans can finance up to 100 percent of the cost of energy efficiency projects. • The maximum amount is $3 million per application.	This funding source provides low-interest loans to eligible applicants for feasibility studies and for the installation of energy-saving measures. Renewable energy projects are identified as eligible projects. However, projects must meet a defined payback and loans must be repaid from energy cost savings. To determine eligibility for this funding source, the project requires further development (i.e., technology and site selection, and determination of project-specific energy cost savings, if any). When the project is further defined, energy cost savings, if any, could be determined from which the potential award amount could be calculated - i.e., to make sure payback requirements would be met.	Eligible Projects: • Energy generation including renewable energy projects are available. • Facilities eligible: existing buildings, new construction or other energy-using facilities. Energy efficiency projects must be technically and economically feasible. • Projects must have a simple payback of 9.8 years or less based on energy costs savings. • Loans for energy projects must be repaid from savings within 15 years including principal and interest. Funds available on a reimbursement basis. • Final 10 percent of funds will be retained until project is completed. Interest is charged on unpaid principle computed from date of each disbursement to the borrower. • Repayment schedule is negotiable up to 15 years and will be based on annual projected energy cost savings from aggregated projects.	• *Submission:* California Energy Commission Public Programs Office Attn: ECAA Loan Program 1516 Ninth Street, MS 42 Sacramento, CA 95814-5512 • *Deadline for Receipt of Applications:* solicitation is open continuously with no final filing date • Website: www.energy.ca.gov/efficiency/financing/index.html • Application online or call 916-654-4147 • Eligibility: Schools (public only), Hospitals (public only), Cities, Counties, Special districts, Public care institutions (public only) • Energy Commission will review the application and contact you within 15 days

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109TH CONGRESS } HOUSE OF REPRESENTATIVES { REPORT
1st Session } { 109–275

MAKING APPROPRIATIONS FOR ENERGY AND WATER DEVELOPMENT FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 2006, AND FOR OTHER PURPOSES

NOVEMBER 7, 2005.—Ordered to be printed

Mr. HOBSON, from the committee of conference, submitted the following

CONFERENCE REPORT

[To accompany H.R. 2419]

The committee of conference on the disagreeing votes of the two Houses on the amendment of the Senate to the bill (H.R. 2419) "making appropriations for energy and water development for the fiscal year ending September 30, 2006, and for other purposes", having met, after full and free conference, have agreed to recommend and do recommend to their respective Houses as follows:

That the House recede from its disagreement to the amendment of the Senate, and agree to the same with an amendment, as follows:

In lieu of the matter stricken and inserted by said amendment, insert:

That the following sums are appropriated, out of any money in the Treasury not otherwise appropriated, for the fiscal year ending September 30, 2006, for energy and water development and for other purposes, namely:

TITLE I

CORPS OF ENGINEERS—CIVIL

DEPARTMENT OF THE ARMY

CORPS OF ENGINEERS—CIVIL

The following appropriations shall be expended under the direction of the Secretary of the Army and the supervision of the Chief of Engineers for authorized civil functions of the Department of the Army pertaining to rivers and harbors, flood control, shore protec-

guidance provided in this statement. Consistent with prior years, the conferees have not provided the Department with any internal reprogramming flexibility in fiscal year 2006, unless specifically identified in the conference report for particular programs, projects, or activities. Any reallocation of new or prior year budget authority or prior year deobligations must be submitted to the Appropriations Committees in writing and may not be implemented prior to approval by the Committees on Appropriations.

ENERGY SUPPLY AND CONSERVATION

The conference agreement provides $1,830,936,000 for Energy Supply and Conservation. The conferees direct that the Office of Electricity Delivery and Energy Reliability function as the principal DOE liaison with the Federal Energy Regulatory Commission.

Congressionally directed projects.—The conference agreement includes a list of Congressionally directed projects, within available funds, at the end of the Energy Supply and Conservation section. In the event the project totals exceed twenty percent of a subaccount, the Department has the discretion to fund these projects within other Energy Supply and Conservation subaccounts than those identified in the table. The conferees remind recipients that statutory cost sharing requirements may apply to these projects.

ENERGY EFFICIENCY AND RENEWABLE ENERGY RESOURCES

The conference agreement provides $1,185,700,000 for energy efficiency and renewable energy resources. The conferees provide $4,000,000 for the National Center on Energy Management and Building Technologies, and direct that this project shall be subject to the cost-sharing requirements of a research project rather than a demonstration project.

The conferees support DOE's efforts to strengthen project management within the Office of Energy Efficiency and Renewable Energy (EERE) with the establishment of the Project Management Center (PMC). With the success of the PMC, the conferees see no need for third-party contracting agents, and discourage the Department from engaging in third-party arrangements for the award and distribution of federal funds.

Hydrogen Technology.—The conference agreement includes $157,199,000 for hydrogen technology, of which $76,100,000 is designated for fuel cell technologies. The conferees provide the budget request for distributed reforming and electricity development, and no funds for recapturing heat from PEM fuel cells within distributed energy systems. The conferees provide $14,900,000 for infrastructure and $24,000,000 for vehicles for the demonstration projects in the budget request.

Biomass and Biorefinery Systems R&D.—The conference agreement includes $91,634,000 for integrated research and development on biomass and biorefinery systems. The conferees provide $3,500,000 for the Consortium for Plant Biotechnology Research.

Solar Energy.—The conference agreement includes $83,953,000 for solar energy programs, which includes $11,000,000 for concentrating solar power.

Wind energy.—The conference agreement includes $39,249,000 for wind energy programs.

Geothermal Technology.—The conference agreement includes $23,299,000 for geothermal technology, to include continued funding at current year levels for GeoPowering the West.

Hydropower.—The conferees recommend $500,000 for hydropower research. The Department should complete integration studies and close out outstanding contracts in advanced hydropower technology.

Vehicle Technologies.—The conferees recommend $183,943,000, which includes an increase of $1,000,000 for Advanced Combustion R&D, Combustion and Emission Control. The conferees provide $19,000,000 for the Automotive Lightweight Materials program; $500,000 for the hydrogen natural gas vehicles cylinder safety, inspection and maintenance program; and $3,500,000 for the Off-Highway Program. The conference agreement provides $10,000,000 to Oak Ridge National Laboratory to be divided evenly between materials development and computational modeling to develop highway transportation technologies.

Building Technologies.—The conferees recommend $69,966,000, to include $10,256,000 for equipment standards and analysis, an increase of $7,000,000 for lighting R&D, and a $3,000,000 increase for thermal insulation and building materials. Within the $20,000,000 provided for lighting R&D, $5,000,000 is to support a National Center for solid state lighting research and development through the Office of Science, to be competed among the centers for nanotechnologies. The conferees provide $1,000,000 for Oil Heat Research for residential buildings. The conferees encourage the Department to support energy efficiency research for affordable, factory-built housing through the Manufactured Housing Research Alliance.

Report Requirement.—The conferees request a report on appliance efficiency standards as directed in the House report.

Industrial Technologies.—The conference agreement includes $57,429,000 for industrial technologies, to include an increase of $2,402,000 for Industries of the Future, and a decrease of $1,642,000 for combustion R&D.

Distributed Energy and Electricity Reliability Program.—The conferees direct the activities within this account be merged within the Office of Electricity Delivery and Energy Reliability (OE), and the conference agreement includes $60,666,000 within OE to support these activities.

Federal Energy Management Programs.—The conferees provide $19,166,000 for the Federal Energy Management Programs, including $2,019,000 for the Departmental Energy Management Program.

Facilities and Infrastructure.—The conferees provide $26,315,000 for renewable energy Facilities and Infrastructure. This amount includes $5,800,000 for operations and maintenance of the National Renewable Energy Laboratory (NREL) in Golden, Colorado; $10,515,000 to continue construction of the new Science and Technology facility at NREL (project 02–E–001); and $10,000,000 for the design and construction of the already approved research support facilities at the National Renewable Energy Laboratory.

The conferees direct that the design of the facilities should be bid competitively, and should demonstrate the use of state of the art renewable energy and energy efficiency technologies in the design of the buildings.

Weatherization and Intergovernmental activities.—The conferees provide $240,400,000 for weatherization assistance program grants, $4,600,000 for training and technical assistance, $36,000,000 for state energy program grants, $500,000 for state energy activities and $25,657,000 for gateway deployment. The conferees recommend that gateway deployment funds be distributed as follows: $3,807,000 for Rebuild America, $350,000 for energy efficiency information and outreach, $4,500,000 for building codes training and assistance, $8,000,000 for Clean Cities of which an additional $1,490,000 is provided above the budget request to expand E–85 fueling capacity, $6,000,000 for Energy Star, and $3,000,000 for inventions and innovations. The conferees include $3,910,000 for the international renewable energy program, $4,000,000 for tribal energy to include $1,000,000 for the Council of Renewable Energy Resource Tribes (CERT), and $5,000,000 for the Renewable Energy Production Incentive (REPI).

Program Support.—The conferees provide is $13,456,000 for Program Support, to include $3,500,000 to continue the efforts of the National Renewable Energy Laboratory to develop renewable energy resources uniquely suited to the Southwestern United States through its virtual site office in Nevada.

Program Direction.—The conferees provide $99,524,000 for Program Direction. The reduction of $2,000,000 from the request reflects the transfer of program direction funds to the Office of Electricity Delivery and Energy Reliability.

Regional Offices.—The conferees provide full funding for the six regional offices in fiscal year 2006. However, the conferees understand that the Administration is unlikely to request funding for the regional offices in the fiscal year 2007 budget request. In light of this, the conferees direct the regional offices be consolidated into the Project Management Center at the Golden Field Office and the National Energy Technology Laboratory not later than September 30, 2006.

OFFICE OF ELECTRICITY DELIVERY AND ENERGY RELIABILITY

The conferees provide $163,513,000 for Office of Electricity Delivery and Energy Reliability. The conferees direct that the activities within the Distributed Energy and Electricity Reliability Program, previously funded in the Energy Conservation account, be merged within the Office of Electricity Delivery and Energy Reliability. The conference agreement includes $60,666,000 for the transferred activities. Within available funds, the conference recommendation includes $2,000,000 for Thermal Energy Technologies; $2,000,000 for gas engine-driven heat pump development; $2,000,000 to complete the on-going Ammonia Absorption Technology Development for HVAC&R activity; $2,500,000 for a CHP engineering prototype and field test activity of ammonia absorption technology; continuation of desiccant research at a level of $1,500,000; and continuation of heat and mass transfer activities at a level of $2,000,000. The conference agreement includes

$5,000,000 to conduct electricity transmission, distribution and energy assurance research and development activities at the National Energy Technology Laboratory and $10,000,000, equally divided between Idaho and Sandia National Laboratories, to support activities at the SCADA test facilities. The conference agreement includes $3,000,000 for deployment testing and analysis of advanced energy storage systems for telecommunication applications in Kansas. Detailed subprogram allocations are shown in the table at the end of Title III.

Program Direction.—The conference agreement includes $13,447,000 for program direction.

NUCLEAR ENERGY PROGRAMS

The conference agreement provides a total of $557,574,000 for nuclear energy programs. The Office of Nuclear Energy, Science and Technology is the lead office with landlord responsibilities for the Idaho site. Because this site provides considerable support to defense activities and naval nuclear reactors, $123,873,000 of costs is allocated to Other Defense Activities and $13,500,000 is allocated to Naval Reactors. Both programs are in the 050 budget function.

University Reactor Fuel Assistance and Support.—The conference agreement includes $27,000,000. The conferees support the inclusion of the Institute of Nuclear Science and Engineering at Idaho National Laboratory in this program.

Nuclear Energy Research and Development.—The conference agreement provides $226,000,000 for nuclear energy research and development. The conference agreement provides $66,000,000 for Nuclear Power 2010.

For Generation IV Nuclear Energy Systems, the conferees provide $55,000,000, of which $40,000,000 is provided for the Next Generation Nuclear Power Plant program. Within available funds, $4,000,000 is provided for the development of multiple high temperature fuel fabrication techniques in support of the Generation IV Nuclear Energy Systems.

The conferees provide $25,000,000 for the Nuclear Hydrogen Initiative. The conferees provide an additional $5,000,000 over the request to accelerate essential materials research and development and component design, test and evaluation for implementing the high temperature sulfuriodine water splitting process for hydrogen production necessary to the advanced reactor hydrogen co-generation project at Idaho National Laboratory.

The conferees provide $80,000,000 for the Advanced Fuel Cycle Initiative (AFCI), $10,000,000 over the request. The additional funds are to be used to accelerate the design activities associated with a proposed Engineering Scale Demonstration (ESD). This funding will allow completion of the conceptual design in fiscal year 2006 and enable pre-engineering design to commence in fiscal year 2007. The conferees direct the Department to accelerate the development of a separations technology that can address the current inventories of commercial spent nuclear fuel and select the preferred technology no later than the end of fiscal year 2007. The conferees direct the Department to submit the spent nuclear fuel recycling

technology plan to the House and Senate Committees on Appropriations by March 1, 2006.

Reporting requirement.—The conferees direct the Department to submit to the House and Senate Committees on Appropriations a report on sodium bonded spent fuel, as outlined in the Senate report, no later than March 1, 2006.

Radiological Facilities Management.—The purpose of the Radiological Facilities Management program is to maintain the critical infrastructure necessary to support users from the defense, space, and medical communities on a reimbursable basis. The conference agreement provides $54,595,000 for this work.

The conferees provide $39,700,000 for Space and Defense Infrastructure. This includes the requested amounts to operate radioisotope power systems at the Idaho National Laboratory (INL), maintain iridium capabilities at Oak Ridge National Laboratory, and maintain and operate the Pu-238 mission at Los Alamos. The conferees recognize the need to free up floor space in TA–55 for pit production, and direct the Department to develop a strategy to relocate expeditiously the mission for Pu-238 processing from Los Alamos to INL. The conferees provide an increase of $8,500,000 for INL to plan and build the capability to assume the Pu-238 mission, so there is no gap in capability during the mission transfer. The conferees direct the Department to provide a mid-year report by March 31, 2006, on the transfer strategy and associated costs.

The conferees provide $14,395,000 for Medical Isotopes Infrastructure, and $500,000 for Enrichment Facility Infrastructure. The conferees provide no funding for the Medical Isotope Production and Building 3019 Complex Shutdown project. The conferees direct the Department to terminate promptly the Medical Isotope Production and Building 3019 Complex Shutdown project. The responsibility for disposition of the U–233 is transferred to the Defense Environmental Management program per DOE's recommendation, and the conferees have provided funds in the Defense Environmental Management appropriation for disposition of the material stored in Building 3019.

Idaho Facilities Management.—The conference agreement provides $113,862,000 for Idaho National Laboratory (INL) operations and infrastructure. Of this total, $82,600,000 is allotted to the 270 budget function and the balance, $31,262,000, is allotted to the 050 function and funded under Other Defense Activities and Naval Reactors. The conferees provide $102,907,000 for INL operations, $69,145,000 from function 270 Energy Supply, $17,762,000 from Other Defense Activities, and an increase of $13,500,000 from the Office of Naval Reactors to support the Idaho National Laboratory's Advanced Test Reactor (ATR) life extension program. The conferees also provide an additional $2,500,000 for the utility corridor extension project at the Idaho National Laboratory. The conferees provide $10,955,000 for Idaho facilities construction. This includes the requested amounts for the Gas Test Loop in the Advanced Test Reactor.

Idaho Site-wide Safeguards and Security.—The conferees provide $75,008,000 for Idaho sitewide safeguards and security as an 050 Defense Activity under the Other Defense Activities account.

Program Direction.—The conference agreement includes $61,109,000 for program direction. Of this amount, $30,006,000 is funded in the Energy Supply appropriation under budget function 270, and $31,103,000 is funded in the Other Defense Activities appropriation under budget function 050.

ENVIRONMENT, SAFETY AND HEALTH

The conference agreement provides $28,000,000 for non-defense environment, safety and health activities. The conference agreement includes $20,900,000 for program direction, the same as the budget request.

LEGACY MANAGEMENT

The conference agreement provides $33,522,000 for the Energy Supply-related activities of the Office of Legacy Management.

CONGRESSIONALLY DIRECTED ENERGY SUPPLY & CONSERVATION PROJECTS

Sub-accounts	Project	Conference recommendations
Biomass	Univ. of Georgia Biomass Pyrolysis Biorefinery Project (GA)	$1,250,000
	National Biofuel Energy Laboratory, NextEnergy Center (MI)	2,000,000
	Biomass Research Agricultural Development Ctr. (OH)	1,500,000
	Texas A&M Renewable Energy Animal Waste Project (TX)	1,000,000
	Wood Debris Bioenergy Project (CO)	1,000,000
	Clarkson Univ. Dairy Waste Public/Private Partnership (NY)	250,000
	Madison County Landfill Gas to Energy Project (NY)	1,000,000
	Asphalt Roofing Shingles into Energy Project, Xenia (OH)	1,000,000
	Ohio State University 4–H "Green" Building Project (OH)	1,000,000
	University of Iowa National Ag-Based Industrial Program (IA)	500,000
	Solid Waste Authority Pyramid Resource Center (OH)	2,000,000
	City of Stamford Waste-to-Energy Project (CT)	1,500,000
	Iowa State Univ. Biomass Energy Conversion Project (IA)	500,000
	Louisiana State Univ. Sugar Base Ethanol (LA)	500,000
	Iroquois Bio-Energy Consortium Ethanol Project (IN)	3,500,000
	Biotech to Ethanol Project (CO)	1,000,000
	New York Biomass/Methane Gas Power Fuel Cell Project (NY)	2,000,000
	Western Massachusetts Biomass Project (MA)	500,000
	Greenville Composite Biomass Project (ME)	750,000
	Research Triangle Institute Biomass Project (NC)	1,250,000
	Chariton Biomass Project (IA)	750,000
	Laurentian Bio-Energy Project (MN)	1,250,000
	Kona Carbon Biomass Project (HI)	1,000,000
	Mississippi State University Sustainable Energy Center (MS)	11,000,000
	Missouri Biodiesel Demonstration Project (MO)	1,000,000
	Auburn Alternative Fuel Source Study of Cement Kilns (AL)	1,000,000
	Canola-based Automotive Oil R&D (PA)	1,000,000
	Center for Advanced Bio-based Binders (IA)	800,000
	Devel. of Applied Membrane Technology for Processing Ethanol from Biomass (DE).	500,000
	Univ. of N. Iowa National Ag-Based Industrial Lubriant Center (IA)	500,000
	Michigan Biotechnology Institute (MI)	1,000,000
	Washington State Ferries Biodiesel Demonstration Project (WA)	500,000
	Oxydiesel demonstration project in California and Nevada (NV)	500,000
	LSU Biorefinery for Ethanol Chemicals, Animal Feed and Biomaterials (LA).	500,000
	Vermont Biomass Energy Resource Center (VT)	500,000
	UNLV Research Foundation Development of Biofuels Utilizing Ionic Transfer Membranes (NV).	3,000,000
Building tech	Carnegie Mellion Univ. Advanced Building Testbed (PA)	1,000,000
	National Center on Energy Management & Building Tech. (NV)	4,000,000
	University of Louisville Sustainable Buildings Project (KY)	400,000
Weath.	Office of International Energy Market Development (WV)	600,000

CONGRESSIONALLY DIRECTED ENERGY SUPPLY & CONSERVATION PROJECTS—Continued

Sub-accounts	Project	Conference recommendations
Clean Cities	E–85 Ethanol Vehicle Refueling Expansion (multi state)	500,000
Int-Govt	International Utility Electricity Partnership (IUEP)	3,500,000
Prog. Supp	NREL virtual site office in Nevada (NV)	3,500,000
Geothermal	Ohio Wesleyan Univ. Geothermal Demonstration Project (OH)	750,000
	Springfield Equestrian Center Energy Efficiency Project (OH)	1,500,000
	Lipscomb University Geothermal System (TN)	500,000
	Geothermal and Renewable Energy Laboratory of Nevada (NV)	1,000,000
Hydrogen	University of South Carolina Fuel Cell Design Project (SC)	2,000,000
	Fuel Cell Freeze/Cold Start Program (CT)	1,000,000
	Center for Intelligent Fuel Cell Materials Design (multi-state)	1,500,000
	Hydrogen Fuel Cell Project Edison Materials Technology (OH)	2,500,000
	Indigenous Energy Development Center (PA)	1,000,000
	Delaware State University Center for Hydrogen Storage (DE)	1,000,000
	Florida Int'l Univ. Cntr for Energy & Tech. of the Americas (FL)	1,000,000
	City of Auburn Energy Production Issues at Wastewater Plant (NY)	900,000
	Hydrogen Fleet Infrastructure Demonstration Project (MI)	2,000,000
	Purdue Hydrogen Technologies Program (IN)	1,000,000
	Detroit Commuter Hydrogen Project (MI)	1,300,000
	City of Chicago Ethanol to Hydrogen Project (IL)	2,000,000
	California Hydrogen Storage and Systems Technologies (CA)	1,000,000
	Univ. of Arkansas at Little Rock Hydrogen Storage Project (AR)	400,000
	Univ. of Akron Fuel Cell Laboratory (OH)	500,000
	Kettering Univ. Fuel Cell Project (MI)	500,000
	Hydrogen Optical Fiber Sensors (CA)	500,000
	UNLV Research Foundation solar-powered thermochemical prod. of hydrogen (NV).	3,400,000
	UNLV Research Foundation hydrogen fuel cell & storage R&D (NV)	3,400,000
	Montana Palladium Research Center (MT)	2,500,000
	Regional Transportation Commission of Washoe Co. Hydrogen Fuel Cell Project (NV).	2,500,000
	U. of Arkansas Little Rock Nanotechnology Center production of Hydrogen (AR).	500,000
	UNLV Research Foundation renewable hydrogen fueling station system, including development of high pressure electrolysis using photovoltaics (NV).	3,400,000
	UNLV Research Foundation development of photoelectric chemical production of hydrogen (NV).	2,500,000
	Univ. of S. Mississippi's School of Polymers and High Performance Materials Improved Materials for Fuel Cell Membranes Program (MS).	500,000
	Univ. of Nevada-Reno Photoelectrochemical generation of hydrogen by solid nanoporous titanium dioxide project (NV).	3,000,000
	California Hydrogen Infrastructure Project (CA)	400,000
	Southern Nevada Alternative Fuels Demonstration Project (NV)	500,000
	Hydrogen Mine Loader Project (CO)	250,000
Solar Energy	Rensselaer Polytechnic Inst. Syracuse Univ. "Green Building" (NY)	750,000
	Crowder College Alternative Renewable Energy Center (MO)	1,000,000
	Univ. of Arkansas Research in Solar Energy Field (AK)	500,000
	Oregon Nanoscience and Microtechnologies Institute (OR)	1,500,000
	Conductive Coating Solar Cell Research Project (MA)	1,500,000
	Ultra Thin Film Photo Voltaic Charging System (FL)	1,000,000
	Brightfield Solar Energy (MA)	700,000
	National Orange Photovoltaic Demonstration (CA)	450,000
	Sandia National Lab. Development of advanced cells and modules (NM).	1,000,000
	Sandia National Lab. Megawatt demonstration concentrating solar project (NM).	3,500,000
	UNLV Research Foundation for photonics research, including evaluation of advanced fiber optics for hybrid solar lighting (NV).	2,500,000
Vehicle Tech	Phase II Heavy Vehicle Hybrid Propulsion (WI)	3,000,000
	High Temperature Material Laboratory (TN)	1,000,000
	Turbocharger Diesel Engine R&D (multi-state)	4,000,000
	National Hybrid Truck Manufacturing Program (CA)	2,000,000

CONGRESSIONALLY DIRECTED ENERGY SUPPLY & CONSERVATION PROJECTS—Continued

Sub-accounts	Project	Conference recommendations
	Vehicle Test Strip Equipment Demonstration (NC)	1,500,000
	Oak Ridge National Lab highway transportation technologies (TN)	10,000,000
	Mississippi State University CAVS Center (MS)	4,000,000
	VULCAN Beam Line (TN)	2,000,000
	Transportable Emissions Testing Laboratory	1,500,000
Wind Energy	Mt. Wachusett Community College Wind Project (MA)	1,000,000
	Wyandotte Wind Energy on Brownfields Initiative (MI)	1,000,000
	Illinois State University Wind Energy Resources (IL)	1,000,000
	Texas Tech. Univ. Great Plains Wind Power Facility (TX)	500,000
	Brigham City Turbine (UT)	500,000
	TowerPower Wind Project (MD)	750,000
	White Earth Tribal Nation Wind Project (MN)	1,000,000
	Coastal Ohio Wind Project (OH)	1,000,000
	Randall's and Ward's Island Wind Project (NY)	1,000,000
	Brigham City, UT Wind Energy Project (UT)	500,000
	Alaska Wind Energy (AK)	1,500,000
	Renewable Energy for Rural Economic Development Program (UT)	500,000
	Synchronous Wind Turbines (ID)	500,000
	Texas Tech. Great Plains Wind Power Test Facility (TX)	1,000,000
	North Dakota Hydrogen Wind Pilot Project (ND)	500,000
	Fox Ridge Renewable Energy Education Center (SD)	500,000
	PowerJet Wind Turbine Project (NV)	250,000
OE	Iowa Stored Energy Plant Project (IA)	1,500,000
	University of Louisville Electric Grid Monitoring (KY)	1,000,000
	Gonzaga University electric utility transformation program (WA)	800,000
	Emerson Network Power, Columbus Ohio (OH)	2,000,000
	Energy Security and diversification at Savannah River National Lab (SC).	1,000,000
	City of Nome power generation replacement project (AK)	1,000,000
	Gridwise Northwest Demonstration Project (WA)	1,500,000
	Juneau-Green Creek-Hoonah intertie for Juneau area power system (AK).	1,000,000
	Complete of bi-polar wafer cell Ni-MH electric energy storage system (CT).	1,500,000
	Connecticut Demand Response Technologies Project (CT)	1,000,000
	Notre Dame University Ionic Liquids Research collaboration (IN)	1,500,000
	Advanced Grid Application Consortium (PA)	2,000,000
	Pilot Energy Cost Control Evaluation Project at NETL (WV)	2,000,000
	Green Island Power Authority, Advanced Transmission Project (NY)	1,000,000
	Cleveland State Ctr. for Research in Electric and Aerospace Tech. (OH).	1,000,000
	Advanced Energy Storage, PCRT(MA)	1,000,000
	Tennessee Tech. Univ. Optimization of High Voltage lines (TN)	1,000,000
	Advanced Technology Center (IL)	1,000,000
	Continued Development of an energy information training facility at Camp Dawson (WV).	2,500,000
	West Virginia Univ. Integrated control of next generation power systems project (WV).	1,000,000
	Deployment testing and analysis of advanced energy storage systems for telecommunications applications in Kansas (KS).	2,500,000
	Hawaii/New Mexico Sustainable Energy Security Partnership (HI/NM)	3,000,000
	Navajo Electrification Project (NM)	1,000,000
	Load Control System Reliability (MT)	2,000,000
	University of Missouri-Rolla for electric grid modernization (MO)	1,000,000
	Integrated Distribution Management Systems in Alabama (AL)	800,000
	Houston Advanced Research Center for Second generation dish temperature super conductor devekopment (TX).	250,000
Nuclear Energy	Transfer of Nuclear Safety Technologies in Lithuania	3,000,000
	Utility Corridor Extension Project at the Idaho National Lab (ID)	2,500,000

CONGRESSIONALLY DIRECTED ENERGY SUPPLY & CONSERVATION PROJECTS—Continued

Sub-accounts	Project	Conference recommendations
	UNLV Research Foundation 5-year cooperative agreement to study deep burn-up of nuclear fuel and other fuel cycle research to eliminate the need for multiple spent nuclear fuel repositories, to eliminate weapons useable materials from disposed spent fuel, and to maintain forever potential radiological releases from a repository below currently legislated limits (NV).	5,000,000
	Idaho Accelerator Center (ID)	2,000,000
	Nuclear Energy Materials Test Station at Los Alamos Neutron Science Center (NM).	3,500,000
	University of Nevada Reno Center for Materials Reliability (NV)	1,000,000
	Univ. of Nevada Reno Nuclear Transportation Hazard Research (NV)	750,000

CLEAN COAL TECHNOLOGY

(DEFERRAL AND RESCISSION)

The conference agreement provides for the deferral of $257,000,000 in clean coal technology funding until fiscal year 2007. These balances are no longer needed to complete active projects in this program. These funds are to be used for costs associated with the FutureGen program in fiscal year 2007 and beyond, to develop a coal-fired, nearly emissions-free electricity and hydrogen generation plant. The conference agreement rescinds $20,000,000 of prior year uncommitted balances from excess contingency estimates in demonstration projects. This rescission was misapplied to Fossil Energy Research and Development in both the House and Senate reports, and is now correctly applied to Clean Coal Technology.

FOSSIL ENERGY RESEARCH AND DEVELOPMENT

The conference agreement provides $597,994,000 for fossil energy research and development. Bill language is included providing that Federal employees in fiscal year 2006 performing research and development activities at the National Energy Technology Laboratory can be funded from program accounts. The conferees direct the Department to budget for the salaries and expenses of federal employees in program direction accounts, and the fiscal year 2007 budget request should reflect this adjustment.

Clean coal power initiative.—The conference agreement provides $50,000,000, the amount of the budget request for the Clean Coal Power Initiative (CCPI). The $50,000,000 request from the Administration in fiscal year 2006 is woefully short of the $200,000,000 commitment made by the Administration. The conferees direct the Administration to fulfill the commitments made to CCPI. Funds remaining from the termination of the low emission boiler project are to be transferred to the Clean Coal Power Initiative.

FutureGen.—The conference agreement provides $18,000,000, the amount of the request for FutureGen. The conferees understand and recognize the value of the FutureGen project. However, the conferees are concerned about maintaining adequate funding for the core fossil energy research, development, and demonstration programs, especially with the new programmatic demands of the

Energy Policy Act of 2005. The conferees will continue to give full consideration to the FutureGen project, contingent upon the Administration maintaining adequate funding requests for other related fossil energy programs.

Fuels and Power Systems.—The conference agreement provides a total of $311,998,000 for Fuels and Power Systems. Within the funds provided, the conferees provide $25,400,000 for innovations at existing plants; $56,450,000 for advanced Integrated Gas Combined Cycle; $18,000,000 for advanced turbines; $67,000,000 for carbon sequestration (including $6,000,000 for Center for Zero Emissions Research and Technology of which $1,500,000 is for the Los Alamos National Laboratory); $29,000,000 for fuels; $62,000,000 for fuel cells including $8,000,000 for high temperature electrochemistry; and $53,154,000 for advanced research. The conferees provide $4,000,000, the amount of the budget request, for the Focus Area for the Computational Energy Science. The conferees provide $994,000 for the U.S./China Energy and Environmental Center. The conferees direct that any hydrogen research and development funded under Fossil Energy be focused on fossil fuels research and development. The conferees are aware of the work conducted by C1Chemistry, and encourage the Department to consider proposals for additional research by the consortium.

Natural Gas Technologies.—The conference agreement provides $33,000,000 for natural gas technologies, an increase of $23,000,000 over the budget request. The conferees provide $9,000,000 for advanced drilling, completion and stimulation, including Deep Trek; $4,000,000 to continue work aimed at expanding the recoverability of natural gas from low-permeability formations; $2,000,000 for stripper wells and technology transfer; $1,000,000 to improve the reliability and efficiency of gas storage systems; and $2,000,000 for liquid natural gas technologies. Within the funds provided, the conference agreement includes $12,000,000 for gas hydrates, and $3,000,000 to continue research to develop treatment technologies that will allow water from conventional gas wells or coal bed methane wells to be put to beneficial use or to be safely discharged to the surface.

Petroleum-Oil Technologies.—The conference agreement provides $32,000,000 for petroleum-oil technologies, an increase of $22,000,000 over the budget request. The conferees provide $4,000,000 for enhancing utilization of industrial carbon dioxide; $4,000,000 for drilling and completion enhancements that support microhole exploration; $4,000,000 for reservoir imaging; $3,000,000 for improved gas flooding recovery methods; $6,000,000 reservoir life extension; $10,000,000 for environmental protection; and, $1,000,000 for the Interstate Oil and Gas Compact Commission.

Program Direction.—The conference agreement includes $106,941,000, an increase of $8,000,000 above the budget request, for the National Energy Technology Laboratory to maintain the personnel that otherwise would have been lost as the result of the proposed gas and petroleum-oil program reductions in the budget request.

Plant and Capital Equipment.—The conference agreement includes $20,000,000 for plant and capital equipment, an increase of $20,000,000 above the budget request. Within these funds,

$18,000,000 is for the infrastructure improvement program at the National Energy Technology Laboratory and $2,000,000 is for general plant projects.

Other programs.—The conference agreement includes $9,600,000 for fossil energy environmental restoration; $1,799,000 for import/export authorization; $8,000,000 for advanced metallurgical research; $656,000 for special recruitment programs; and $6,000,000 for the Energy and Environmental Research Center under cooperative research and development.

Prior year balances.—The conference agreement recommends no reduction in prior year balances, instead of the $20,000,000 reduction as proposed by the House and by the Senate.

Congressionally Directed Projects.—The conferees' recommendation includes the following Congressionally directed projects, within available funds. The conferees remind recipients that statutory cost sharing requirements may apply to these projects.

CONGRESSIONALLY DIRECTED FUELS & POWER PROJECTS

Accounts	Project	Conference recommendation
Fuels & Power	Ramgen engine development (multi state)	$2,500,000
	MW-Scale oxide fuel cell gas turbine hybrid system (multi state)	2,500,000
	MW-Scale Solid oxide fuel cell stat. power generation (OH)	3,000,000
	Jupiter Oxy Fuel Tech (multi state)	7,800,000
	Solid oxide fuel cell tech. Stat power applications project (NC)	1,000,000
	Powerspan Electro Catalytic Oxidation project (OH)	1,000,000
	New York City Parks Randall's Island (NY)	1,000,000
	Center for Advanced Separation Technologies (VA)	1,000,000
	Power Plant Flue Gas Cleaning/Poll Elimination project (VA)	2,200,000
	GEDAC packaged Gas Engine-Driven Heat Pump (multi state)	2,200,000
	Planar Solid Oxide Fuel Cell Project (CA)	1,500,000
	Advanced Metallurgical Process, Albany Research Center (OR)	1,300,000
	Energy and Environmental Research Center (EERC) (ND)	1,000,000
	Development of continuous solvent extraction processes for coal derived carbon products (WV).	700,000
	West Virginia Univ. study of long-term environmental and economic impacts of the development of coal liquefaction in China (WV).	500,000
	WVU Lightweight composite materials for heavy duty vehicles program (WV).	500,000
	Coal to Liquids Program—Phase II (MT)	2,000,000
	Utah Center for Ultra-Clean Coal Utilization (UT)	1,900,000
	Coal-Waste Slurry Reburn Project (PA)	500,000
	Univ. of Wyoming Multi-Disciplinary Coal-bed Natural Gas Research Center (WY).	1,500,000
	National Center for Hydrogen Technology (ND)	2,500,000
	ITM/Syngas Project (PA)	2,000,000
	Solid Oxide Fuels Cells (PA)	4,000,000
	National Biofuel Energy Laboratory (MI)	2,000,000
	Arctic Energy Office (AK)	7,000,000
	Risk Base Data Management System (AK)	400,000
	Utah Center for Heavy Oil Research (UT)	1,500,000
	University of Mississippi hydrates research (MS)	1,000,000

NAVAL PETROLEUM AND OIL SHALE RESERVES

The conference agreement provides $21,500,000, the same as the Senate, and an increase of $3,000,000 over the House, to support the activities under the Naval Petroleum Reserve (NPR) Colorado, Utah, and Wyoming program.

109TH CONGRESS } HOUSE OF REPRESENTATIVES { REPORT
1st Session } { 109–188

MAKING APPROPRIATIONS FOR THE DEPARTMENT OF THE INTERIOR, ENVIRONMENT, AND RELATED AGENCIES FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 2006, AND FOR OTHER PURPOSES

JULY 26, 2005.—Ordered to be printed

Mr. TAYLOR of North Carolina, from the committee of conference, submitted the following

CONFERENCE REPORT

[To accompany H.R. 2361]

The committee of conference on the disagreeing votes of the two Houses on the amendment of the Senate to the bill (H.R. 2361) "making appropriations for the Department of the Interior, environment, and related agencies for the fiscal year ending September 30, 2006, and for other purposes", having met, after full and free conference, have agreed to recommend and do recommend to their respective Houses as follows:

That the House recede from its disagreement to the amendment of the Senate, and agree to the same with an amendment, as follows:

In lieu of the matter stricken and inserted by said amendment, insert:

That the following sums are appropriated, out of any money in the Treasury not otherwise appropriated, for the Department of the Interior, environment, and related agencies for the fiscal year ending September 30, 2006, and for other purposes, namely:

TITLE I—DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

MANAGEMENT OF LANDS AND RESOURCES

For necessary expenses for protection, use, improvement, development, disposal, cadastral surveying, classification, acquisition of easements and other interests in lands, and performance of other functions, including maintenance of facilities, as authorized by law, in the management of lands and their resources under the jurisdiction of the Bureau of Land Management, including the general administration of the Bureau, and assessment of mineral potential of public lands pursuant to Public Law 96–487 (16 U.S.C. 3150(a)),

State	Project name	Amount
19. TN	University of Tennessee at Knoxville Natural Resources Policy Center	500,000
20. TX	Comprehensive assessment of Lake Whitney at Baylor University	200,000
21. TX	Environmental program at the Water Policy Institute at Texas Tech University.	450,000
22. TX	Mickey Leland National Urban Air Toxic Research Center	1,500,000
23. TX	Poultry science project at Stephen F. Austin State University	200,000
24. TX	Texas Air Quality Study 2	2,000,000
25. TX	Texas Institute for Applied Environmental Research	400,000
26. TX	Texas State University System Geography and Geology Project	800,000
27. VT	Aiken Greening at the University of Vermont	400,000
28. VT	Proctor Maple Research Station in Underhill, Vermont	200,000
29. WI	Paper industry byproduct waste reduction research in Wisconsin	250,000
30. WV	National Alternative Fuels Training Consortium at West Virginia University.	2,000,000
31.	American Water Works Association Research Foundation	1,000,000
32.	Consortium for Plant Biotechnology Research	750,000
33.	Mine Waste Technology program at the National Environmental Waste Technology, Testing, and Evaluation Center.	2,100,000
34.	New England Green Chemistry Consortium	750,000
35.	Southwest Center for Environmental Research and Policy	1,500,000
36.	Water Environment Research Foundation	3,000,000
37.	Water Systems Council Wellcare Program	1,000,000
Total		33,275,000

Research: Clean Air.—In research: clean air, there are decreases of $600,000 for global change and $2,000,000 for national ambient air quality standards.

Research: Clean Water.—In research: clean water, there is a decrease of $4,800,000 for water quality programs.

Research: Human Health and Ecosystems.—In research: human health and ecosystems, there is an increase of $15,000 for fellowships and decreases of $213,000 for endocrine disruptor research and $5,376,000 for other research, which includes decreases of $2,000,000 for exploratory grants, $600,000 for aggregate risks, $500,000 for condition assessments of estuaries in the Gulf of Mexico, and $2,276,000 for a general program reduction, which should be applied after consultation with the House and Senate Committees on Appropriations.

Research: Land Protection.—In research: land protection, there is a decrease of $2,300,000 for land protection and restoration.

Other.—The managers do not agree with the transfer of research funds to other offices. In addition to the offices mentioned in House Report 109–80, this direction applies to the Office of the Administrator, which was inadvertently omitted from the House report.

ENVIRONMENTAL PROGRAMS AND MANAGEMENT

The conference agreement provides $2,381,752,000 for environmental programs and management instead of $2,389,491,000 as proposed by the House and $2,333,416,000 as proposed by the Senate. Changes to the House recommended level are described below.

Air Toxics and Quality.—In Federal support for air quality management, there are decreases of $5,000,000 for the clean diesel initiative and $5,000,000 for other program activities. Other decreases include $400,000 for radiation protection programs,

$156,000 for stratospheric ozone domestic programs, and $1,600,000 for stratospheric ozone multilateral programs.

Brownfields.—There is an increase of $362,000 for brownfields support.

Climate Protection Programs.—In climate protection, there are increases of $500,000 for the energy star program and $1,500,000 for the methane to markets program.

Compliance Monitoring.—There is a decrease of $3,184,000 for compliance monitoring.

Enforcement Programs.—In enforcement, there are increases of $1,500,000 for civil enforcement, $1,900,000 for criminal enforcement, and $500,000 for enforcement training.

Environmental Protection/Congressional Priorities.—The conference agreement provides a total of $50,543,000 for high priority projects, an increase of $10,543,000 above the House recommended level. The managers have not agreed to a competitive solicitation this year for these programs. This issue may be revisited in future years. The managers agree to the following distribution of funds:

State	Project Name	Amount
1. AL	Alabama Department of Environmental Management for a water and wastewater training program.	$500,000
2. CA	Highland Learning Center	1,750,000
3. CT	Waste to Energy project in Stamford, Connecticut	250,000 ✓
4. CT	Wastewater turbine technology project for the City of New Haven, Connecticut.	500,000
5. FL	University of West Florida Partnership for Environmental Research and Community Health [PERCH] program.	500,000
6. HI	Hawaii Island Economic Development Board's Big Island Recycle program.	500,000 ✓
7. IA	University of Northern Iowa to develop new environmental technologies for small business outreach.	500,000
8. IA	Water quality project in Storm Lake, Iowa	500,000
9. IL	For an aquifer model of groundwater resources	938,000
10. LA	Grambling University in Louisiana for a water quality research program.	200,000
11. LA	Lake Pontchartrain Basin Foundation lake restoration in Louisiana	500,000
12. MA	Environmental and science education program in New Bedford, Massachusetts.	500,000
13. MD	Anacostia River Tidal Wetlands Project	1,000,000
14. MO	Ozarks Environmental and Water Resources Institute at Southwest Missouri State University.	500,000
15. MO	Southwest Missouri Water Quality Improvement Project	1,500,000
16. MS	Environmental education initiative at Crow's Neck Environmental Education Center in Tishomingo County, Mississippi.	130,000
17. MT	Air quality improvement program in Lincoln County, Montana	1,000,000
18. NC	EPA National Computer Center Research Triangle Park, NC Continuity of Operations/Disaster Recovery.	2,000,000
19. NE	Lead-based paint hazard control program in Omaha, Nebraska	500,000
20. NJ	Restoration project in Greenwood Lake, New Jersey	300,000
21. NV	Walker Lake, Nevada Working Group's lake restoration program	250,000
22. NY	Central NY Watersheds in Onondaga and Cayuga Counties Water Quality Management.	1,500,000
23. NY	Long Island Sound restoration	1,800,000
24. NY	Mohawk Valley, New York Water Authority's bacteria detection program	250,000
25. OK	Oklahoma Department of Environmental Quality to complete remediation work on Tar Creek.	2,000,000
26. OR	Oregon Department of Environmental Quality site assessment program	250,000
27. RI	Waterfront stormwater management analysis in East Providence, Rhode Island.	250,000
28. VT	Environmental clean-up and research programs in Lake Champlain, Vermont.	775,000
29. VT	Storm water research program at the University of Vermont	450,000

State	Project Name	Amount
30. WA	Northwest Straits Commission, Washington State University beach watchers marine resources program.	250,000
31. WA	Rathdrum Prairie/Spokane Valley Aquifer study	300,000
32. WA	Spokane River Bi-State Non-Point Phosphorus study	250,000
33. WV	Canaan Valley Institute—On-going Operations	2,000,000
34.	America's Clean Water Foundation On-Farm Assessment and Environmental Review Program.	3,000,000
35.	EPA Region 10 environmental compliance	1,000,000
36.	Groundwater Protection Council	650,000
37.	National Assoc. of Development Organizations Training and Information Dissemination Related to Rural Brownfields, Air Quality Standards, and Water Infrastructure.	500,000
38.	National Biosolids Partnership	1,000,000
39.	National Rural Water Association, including source water protection programs.	11,000,000
40.	Ohio River Pollutant Reduction Program	1,500,000
41.	Rural Community Assistance Program	3,500,000
42.	Small Public Water System Technology Centers at Western Kentucky University, the University of New Hampshire, the University of Alaska-Sitka, Pennsylvania State University, the University of Missouri-Columbia, Montana State University, the University of Illinois, and Mississippi State University.	4,000,000
Total		50,543,000

Geographic Programs.—In geographic programs, there are increases of $2,000,000 for the Chesapeake Bay program, $532,000 for the Gulf of Mexico program, and $1,167,000 in other activities for Lake Pontchartrain, and decreases of $45,000 for the Lake Champlain program and $1,523,000 for the Long Island Sound program.

Indoor Air Programs.—In indoor air, there is a decrease of $400,000 for radon programs.

Information Exchange/Outreach.—In information exchange/outreach, there is a decrease of $400,000 for State and local prevention and preparedness programs.

International Programs.—In international programs, there are decreases of $250,000 for international capacity building and $1,000,000 for the persistent organic pollutants program.

Legal/Science/Regulatory/Economic Review.—There is a decrease of $600,000 for the regulatory innovation program.

Pesticide Licensing.—In pesticide licensing, there is an increase of $3,041,000 for review/re-registration of existing pesticides.

Toxics Risk Review and Prevention.—In the toxics risk review and prevention program, there is an increase of $1,356,000 for the high production volume challenge and high production volume information system and a decrease of $1,582,000 for the pollution prevention program.

Water: Ecosystems.—There is an increase of $2,000,000 for Great Lakes Legacy Act programs.

Water: Human Health Protection.—There are decreases of $1,500,000 for drinking water programs and $10,000,000 for the National Rural Water Association, which is funded under the environmental protection/Congressional priorities activity detailed above.

Water Quality Protection.—There is a decrease of $2,000,000 for the water quality monitoring program.

APPENDIX F

MRF ENGINEERING ANALYSIS BY FACILITY BUILDERS AND ERECTORS

Technology/MRF Comparison Worksheet

FIGURES FOR ONE (1) PROCESSING MODULE AND A DEMONSTRATION FACILITY "ONLY"

Facility Builders Erectors, Inc.

Vendor	MRF	MRF Area Available	CT Supplier Building Area Needed	Design Capacity (expressed in TPD)	Feedstock Transfer	Utilities Needed/Available								Building Design Requisites		
							Elect. Available	Natural Gas Needed	Natural Gas Available	Water Needed (GPM)	Water Available	Sewer Needed (GPM)	Sewer Available	Area Required for Bldg.	Height of Bldg.	Smoke (stack) Height
Arrow	Del Norte Recycling Oxnard	8 Acres or 348481.39 SF Offsite, Adjacent Owned by City	4 Acres or 174240.7 SF	[1] See TPD	Not Provided	[2] See Electricity	Resources Satisfactory	[3] See Natural Gas	Resources Satisfactory	[4] See Water	Resources Satisfactory	[4] See Water	N/A	Not Provided		
	Robt. Nelson Riverside	5 - 7 Acres or 1217800.87 SF - 304921.22 SF Onsite Owned by County	4 Acres or 174240.7 SF	[1] See TPD	Not Provided	[2] See Electricity	Resources Satisfactory	[3] See Natural Gas	Resources Satisfactory	[4] See Water	Resources Satisfactory	[4] See Water	N/A	Not Provided		
	Perris TS & MRF Perris, CA	5+ Acres or 1217800.87+ SF Onsite Owned by CR&R	4 Acres or 174240.7 SF	[1] See TPD	Not Provided	[2] See Electricity	Resources Satisfactory	[3] See Natural Gas	Resources Satisfactory	[4] See Water	Resources Satisfactory	[4] See Water	N/A	Not Provided		
	Community Recycling Sun Valley	1.5 Acres or 65340.261 SF Offsite, Adjacent Owned by Community	4 Acres or 174240.7 SF	[1] See TPD	Not Provided	[2] See Electricity	Resources Satisfactory	[3] See Natural Gas	Resources Satisfactory	[4] See Water	Resources Satisfactory	[4] See Water	N/A	Not Provided		

For Facility Contacts and Utility Vendors - see Attachment 1

[1] TPD - The plant planned for the LA County demonstration project will have "two lines". Assuming a two shift operation, this will process 300 tons per day of MSW. Because ArrowBio is modular, this can be scaled up as needed

[2] Electricity - Steady state electricity is not needed . The plant exports approximately 1 MW/100 Tons Processed

[3] Natural Gas - None, the plant produces methane which is used to generate electricity

[4] Water - Uncertain, approximately 15 gallon of net excess water is produced per ton of MSW processed, or 4,500 gallons per day. It Is yet to be determined whether this will be used on site (after treatment on site to quality standards) or discharged to sewer

8/8/2007

Information Obtained From an Email from Melvin S. Finstein, Ph.D.

Head, ArrowBio USA

Technology/MRF Comparison Worksheet **Facility Builders Erectors, Inc.**

FIGURES FOR ONE (1) PROCESSING MODULE AND A DEMONSTRATION FACILITY "ONLY"

Vendor	MRF	MRF Area Available	CT Supplier Building Area Needed	Design Capacity (expressed in TPD)	Feedstock Transfer	Utilities Needed/Available								Building Design Requisites		
							Elect. Available	Natural Gas Needed (MMBtu/hr)	Natural Gas Available	Water Needed (GPM)	Water Available	Sewer Needed (GPM)	Sewer Available	Area Required for Bldg.	Height of Bldg.	Smoke (stack) Height
Changing World Technologies	Del Norte Recycling Oxnard	8 Acres or 348481.39 SF Offsite, Adjacent Owned by City	3 Acres or 130680.52 SF	220	Not Provided	*(1) See Electricity*	Resources Satisfactory	*(2) See Natural Gas*	Resources Satisfactory	*(3) See Water*	Resources Satisfactory	*(4) See Sewer*	Resources Satisfactory	Not Provided		
	Robt. Nelson Riverside	5 - 7 Acres or 1217800.87 SF - 304921.22 SF Onsite Owned by County	3 Acres or 130680.52 SF	220	Not Provided	*(1) See Electricity*	Resources Satisfactory	*(2) See Natural Gas*	Resources Satisfactory	*(3) See Water*	Resources Satisfactory	*(4) See Sewer*	Resources Satisfactory	Not Provided		
	Perris TS & MRF Perris, CA	5+ Acres or 1217800.87+ SF Onsite Owned by CR&R	3 Acres or 130680.52 SF	220	Not Provided	*(1) See Electricity*	Resources Satisfactory	*(2) See Natural Gas*	Resources Satisfactory	*(3) See Water*	Resources Satisfactory	*(4) See Sewer*	Resources Satisfactory	Not Provided		
	Community Recycling Sun Valley	1.5 Acres or 65340.261 SF Offsite, Adjacent Owned by Community	3 Acres or 130680.52 SF	220	Not Provided	*(1) See Electricity*	Resources Satisfactory	*(2) See Natural Gas*	Resources Satisfactory	*(3) See Water*	Resources Satisfactory	*(4) See Sewer*	Resources Satisfactory	Not Provided		

For Facility Contacts and Utility Vendors - see Attachment 1

(1) Electricity (using Carthage as the basis) - Peak Need = 1,100 KW for Start-up; Steady State = 900 KW & Main MCC Buss = 3,000 AMPS

Once facility started up , it is self sustaining & will export power

(2) Natural Gas - The TCP plant gas requirement was stated to be 12 MMBTU/hr. We felt the TCP fuels gas would produce 7.7 MMBTU/hr and that we would need a need a supplemental 4.3 MMBtu/hr for steady-state operations. Start up & unusual cases would increase this supplemental requirement up to 7.3 MMBtu/hr (for a total of 15 MMBtu/hr for short periods of 8-16 hrs for startup)

(3) Water - The TCP process water requirement is 20 tons per day (3.3 GPM) but the water utility should be sized to handle 30 GPM of water for flushing cycles . Most of the water used in the TCP is recycled to the maximum extent . There may be a vacuum/compression recovery system utilized to minimize wastewater disposal and some of the wastewater may be used in a boiler to make steam in the process. It is assumed that the $35 /ton cost to procure city water also includes all sewer charges

(4) Sewer - For disposal purposes, it is assumed that the TCP demonstration facility would be tied into the same wastewater system as the MRF/TS. Since the TCP subjects feeds to elevated temperatures for an extended time, pathological vectors and bacteria are destroyed; therefore, any wastewater can be easily process by conventional wastewater technology. CCWT is hesitant to provide detailed information regarding water recycling within the TCP process since some of the information is proprietary. Also, until further discussions determine the amount of process water available at each site, the required size of the utility boiler, or the extent of recycling to offset the TCP water input requirement, any information given at this point is a gross assumption. Nonetheless, we can assume that the similarly-sized MSW facility will have a boiler feed water requirement close to that of the Carthage Facility (1725 lbs/hr.). We can also assume that the produced water recycling would be easier (due to a greatly reduced feedstock protein content compared to Carthage) and that we can ssume the following water balance: **NET IN: 31.4 TPD NET OUT: 31.4 TPD**

7/31/2007

Information obtained from an email from Shawn Jones, Chemical Engineer with Changing World Technologies

Technology/MRF Comparison Worksheet

Facility Builders Erectors, Inc.

FIGURES FOR A ONE (1) MODULE (if applicable) DEMONSTRATION FACILITY "ONLY"

Vendor	MRF	MRF Area Available	CT Supplier Building Area Needed	Design Capacity (expressed in TPD)	Feed Stock Transfer	Utilities Needed/Available								Building Design Requisites		
						Elect. Needed (Start-Up Load)	Elect. Available	Natural Gas Needed (therms per hour, TPH)	Natural Gas Available	Water Needed (GPH)	Water Available	Sewer Needed	Sewer Available	Area Required for Bldg.	Height of Bldg.	Smoke (stack) Height
IES/Northern Power	Robt. Nelson Riverside	5 - 7 Acres or 1217800.87 SF - 304921.22 SF Onsite Owned by County	+/- 1.5 Acres or +/- 65340.261 SF	(1) 125 TPD	Grinder, Dryer & Conveyors	300 kW	Resources Satisfactory	(2) 156.3 TPH	Resources Satisfactory	See (3)	Resources Satisfactory	See (4)	Resources Satisfactory	(5) 29,900 SF	80'	100'
	Perris TS & MRF Perris, CA	5+ Acres or 1217800.87+ SF Onsite Owned by CR&R	+/- 1.5 Acres or +/- 65340.261 SF	(1) 125 TPD	Grinder, Dryer & Conveyors	300 kW	Resources Satisfactory	(3) 156.3 TPH	Resources Satisfactory	See (3)	Resources Satisfactory	See (4)	Resources Satisfactory	(6) 24,300 SF	80'	100'
	Rainbow Disposal Huntington Beach	30,000 SF Building Onsite Dedicated to CDT Integrated with MRF	+/- 1.5 Acres or +/- 65340.261 SF	(1) 125 TPD	Grinder, Dryer & Conveyors	300 kW	Resources Satisfactory	(2) 156.3 TPH	Resources Satisfactory	See (3)	Resources Satisfactory	See (4)	Resources Satisfactory	(6) 24,300 SF	80'	100'

For Facility Contacts and Utility Vendors - see Attachment 1

(1) Stated capacity is at 20 percent moisture after drying of the MSW /MRF Residue

(2) Based on a 125 TPD IES Facility

(3) This figure is based on a 125 TPD IES Facility: Blowdown = 505 GPH; Cooling Tower = 53,400 GPH & Scrubber Makeup = 5,500 GPH

(4) Unsure - There is a question of treatment requirements for blowdown and whether it can go directly to sewage
Other sources of information indcate that this will be a zero discharge facility.

(5) Area of Building Design requisites differ between MRFs due to onvsite vs offsite and integration vs non-integration

8/8/2007

Information obtained from conversation with Ms. Karen M. Bertram, President, IES/Northern Power Romoland, CA

Technology/MRF Comparison Worksheet

Facility Builders Erectors, Inc.

FIGURES REPRESENT A ONE (1) PROCESSING MODULE DEMONSTRATION FACILITY "ONLY"

Vendor	MRF	MRF Area Available	CT Supplier Building Area Needed	Design Capacity (expressed in TPD)	Feedstock Transfer	Utilities Needed/Available								Building Design Requisites		
							Elect. Available	Natural Gas Needed (therms per hour, tph)	Natural Gas Available	Water Needed (GPM)	Water Available	Sewer Needed (GPM)	Sewer Available	Area Required for Bldg.	Height of Bldg.	Smoke (stack) Height
IWT	Del Norte Recycling Oxnard	8 Acres or 348481.39 SF Offsite, Adjacent Owned by City	3.5 Acres or 152460.61 SF	312	Press Feeding Cranes	[1] *See Electricity*	Resources SatiSFactory	131	Resources SatiSFactory	139	Resources SatiSFactory	[2] 2,250	Resources SatiSFactory	36,618 SF or 0.84063025 Acre	80'	100'
	Robt. Nelson Riverside	5 - 7 Acres or 1217800.87 SF - 304921.22 SF Onsite Owned by County	3.5 Acres or 152460.61 SF	312	Press Feeding Cranes	[1] *See Electricity*	Resources SatiSFactory	131	Resources SatiSFactory	139	Resources SatiSFactory	[2] 2,250	Resources SatiSFactory	36,618 SF or 0.84063025 Acre	80'	100'
	Perris TS & MRF Perris, CA	5+ Acres or 1217800.87+ SF Onsite Owned by CR&R	3.5 Acres or 152460.61 SF	312	Press Feeding Cranes	[1] *See Electricity*	Resources SatiSFactory	131	Resources SatiSFactory	139	Resources SatiSFactory	[2] 2,250	Resources SatiSFactory	36,618 SF or 0.84063025 Acre	80'	100'
	Community Recycling Sun Valley	1.5 Acres or 65340.261 SF Offsite, Adjacent Owned by Community	3.5 Acres or 152460.61 SF	312	Press Feeding Cranes	[1] *See Electricity*	Resources SatiSFactory	131	Resources SatiSFactory	139	Resources SatiSFactory	[2] 2,250	Resources SatiSFactory	36,618 SF or 0.84063025 Acre	80'	100'

For Facility Contacts and Utility Vendors - see Attachment 1

[1] ***Electricity - 3Mw of temporary construction power. A black start capability will be installed in the system that will not need any start-up power. Once facility started up , it is self sustaining & will export power***

[2] ***Sewer - the 2,250 GPD is the discharge from the facility's showers, kitchen and bathrooms***

8/8/2007

Information obtained from an email from Francis Campbell, President, Interstate Waste Technologies

Technology/MRF Comparison Worksheet

Facility Builders Erectors, Inc.

FIGURES REPRESENT A TWO (2) PROCESSING MODULE DEMONSTRATION FACILITY "ONLY"

Vendor	MRF	MRF Area Available	CT Supplier Building Area Needed	Design Capacity (expressed in TPD)	Feedstock Transfer	Utilities Needed/Available								Building Design Requisites		
							Elect. Available	Natural Gas Needed (therms per hour, tph)	Natural Gas Available	Water Needed (GPM)	Water Available	Sewer Needed (GPM)	Sewer Available	Area Required for Bldg.	Height of Bldg.	Smoke (stack) Height
IWT	Del Norte Recycling Oxnard	8 Acres or 348481.39 SF Offsite, Adjacent Owned by City	5 Acres or 1217800.87 SF	624	Press Feeding Cranes	(1) *See Electricity*	Resources SatiSFactory	262	Resources SatiSFactory	278	Resources SatiSFactory	(2) 2,250	Resources SatiSFactory	73,632 SF or 1.6833266 Acres	80'	100'
	Robt. Nelson Riverside	5 - 7 Acres or 1217800.87 SF - 304921.22 SF Onsite Owned by County	5 Acres or 1217800.87 SF	624	Press Feeding Cranes	(1) *See Electricity*	Resources SatiSFactory	262	Resources SatiSFactory	278	Resources SatiSFactory	(2) 2,250	Resources SatiSFactory	73,632 SF or 1.6833266 Acres	80'	100'
	Perris TS & MRF Perris, CA	5+ Acres or 1217800.87+ SF Onsite Owned by CR&R	5 Acres or 1217800.87 SF	624	Press Feeding Cranes	(1) *See Electricity*	Resources SatiSFactory	262	Resources SatiSFactory	278	Resources SatiSFactory	(2) 2,250	Resources SatiSFactory	73,632 SF or 1.6833266 Acres	80'	100'
	Community Recycling Sun Valley	1.5 Acres or 65340.261 SF Offsite, Adjacent Owned by Community	5 Acres or 1217800.87 SF	624	Press Feeding Cranes	(1) *See Electricity*	Resources SatiSFactory	262	Resources SatiSFactory	278	Resources SatiSFactory	(2) 2,250	Resources SatiSFactory	73,632 SF or 1.6833266 Acres	80'	100'

For Facility Contacts and Utility Vendors - see Attachment 1

(1) ***Electricity - 3Mw of temporary construction power. A black start capability will be installed in the system that will not need any start-up power. Once facility started up , it is self sustaining & will export power***

(2) ***Sewer - the 2,250 GPD is the discharge from the facility's showers, kitchen and bathrooms***

8/8/2007

Information obtained from an email from Francis Campbell, President, Interstate Waste Technologies

Technology/MRF Comparison Worksheet

Facility Builders Erectors, Inc.

FIGURES REFERENCE A THREE (3) PROCESSING MODULE DEMONSTRATION FACILITY "ONLY"

Vendor	MRF	MRF Area Available	CT Supplier Building Area Needed	Design Capacity (expressed in TPD)	Feedstock Transfer	Utilities Needed/Available								Building Design Requisites		
							Elect. Available	Natural Gas Needed (therms per hour, tph)	Natural Gas Available	Water Needed (GPM)	Water Available	Sewer Needed (GPM)	Sewer Available	Area Required for Bldg.	Height of Bldg.	Smoke (stack) Height
IWT	Del Norte Recycling Oxnard	8 Acres or 348481.39 SF Offsite, Adjacent Owned by City	8 Acres or 152460.61 SF	935	Press Feeding Cranes	[(1)] *See Electricity*	Resources SatiSFactory	393	Resources SatiSFactory	417	Resources SatiSFactory	[(2)] 2,250	Resources SatiSFactory	110,448 SF or 2.535527 Acres	80'	100'
	Robt. Nelson Riverside	5 - 7 Acres or 217800.87 SF - 304921.22 SF Onsite Owned by County	8 Acres or 152460.61 SF	935	Press Feeding Cranes	[(1)] *See Electricity*	Resources SatiSFactory	393	Resources SatiSFactory	417	Resources SatiSFactory	[(2)] 2,250	Resources SatiSFactory	110,448 SF or 2.535527 Acres	80'	100'
	Perris TS & MRF Perris, CA	5+ Acres or 217800.87+ SF Onsite Owned by CR&R	8 Acres or 152460.61 SF	935	Press Feeding Cranes	[(1)] *See Electricity*	Resources SatiSFactory	393	Resources SatiSFactory	417	Resources SatiSFactory	[(2)] 2,250	Resources SatiSFactory	110,448 SF or 2.535527 Acres	80'	100'
	Community Recycling Sun Valley	1.5 Acres or 65340.261 SF Offsite, Adjacent Owned by Community	8 Acres or 152460.61 SF	935	Press Feeding Cranes	[(1)] *See Electricity*	Resources SatiSFactory	393	Resources SatiSFactory	417	Resources SatiSFactory	[(2)] 2,250	Resources SatiSFactory	110,448 SF or 2.535527 Acres	80'	100'

For Facility Contacts and Utility Vendors - see Attachment 1

[(1)] ***Electricity - 3Mw of temporary construction power. A black start capability will be installed in the system that will not need any start-up power. Once facility started up , it is self sustaining & will export power***

[(2)] ***Sewer - the 2,250 GPD is the discharge from the facility's showers, kitchen and bathrooms***

8/8/2007

Information obtained from an email from Francis Campbell, President, Interstate Waste Technologies

Technology/MRF Comparison Worksheet

FIGURES FOR ONE (1) PROCESSING MODULE AND A DEMONSTRATION FACILITY "ONLY"

Facility Builders Erectors, Inc.

Vendor	MRF	MRF Area Available	CT Supplier Building Area Needed	Design Capacity (expressed in TPD)	Feedstock Transfer	Utilities Needed/Available								Building Design Requisites		
							Elect. Available	Natural Gas Needed (expressed in the)	Natural Gas Available	Water Needed (expressed in GPM)	Water Available	Sewer Needed (expressed in GPM)	Sewer Available	Area Required for Bldg.	Height of Bldg.	Smoke (stack) Height
Ntech Environmental	Del Norte Recycling Oxnard	8 Acres or 348481.39 SF Offsite, Adjacent Owned by City	3.5 Acres or 152460.61 SF	[(1)] *See TPD*	Not Provided	[(2)] *See Electricity*	Resources Satisfactory	[(3)] *See Natural Gas*	Resources Satisfactory	[(4)] *See Water*	Resources Satisfactory	*No Release to Sewer*	N/A	Not Provided		
	Robt. Nelson Riverside	5 - 7 Acres or 1217800.87 SF - 304921.22 SF Onsite Owned by County	3.5 Acres or 152460.61 SF	[(1)] *See TPD*	Not Provided	[(2)] *See Electricity*	Resources Satisfactory	[(3)] *See Natural Gas*	Resources Satisfactory	[(4)] *See Water*	Resources Satisfactory	*No Release to Sewer*	N/A	Not Provided		
	Perris TS & MRF Perris, CA	5+ Acres or 1217800.87+ SF Onsite Owned by CR&R	3.5 Acres or 152460.61 SF	[(1)] *See TPD*	Not Provided	[(2)] *See Electricity*	Resources Satisfactory	[(3)] *See Natural Gas*	Resources Satisfactory	[(4)] *See Water*	Resources Satisfactory	*No Release to Sewer*	N/A	Not Provided		
	Community Recycling Sun Valley	1.5 Acres or 65340.261 SF Offsite, Adjacent Owned by Community	3.5 Acres or 152460.61 SF	[(1)] *See TPD*	Not Provided	[(2)] *See Electricity*	Resources Satisfactory	[(3)] *See Natural Gas*	Resources Satisfactory	[(4)] *See Water*	Resources Satisfactory	*No Release to Sewer*	N/A	Not Provided		

For Facility Contacts and Utility Vendors - see Attachment 1

[(1)] ***TPD - Information is based on 140,000 TPY facility.***

[(2)] ***Electricity - 2MWe. Facility is self sustaining (i.e., a net exporter of electricity) at steady state operation.***

[(3)] ***Natural Gas - Fuel type illustrated in Fuel Oil - Consumption 102,000 lts per year (to be generated on-site)***

[(4)] ***Water - For boilers and air abatement only 1.3M Cubic Feet Per Year***

8/8/2007

Information Obtained From an Email from Roger Wilmot, N-Tech Environmental

FACILITY & UTILITY INFORMATION FOR MRFs

Del Norte Regional Recycling
www.ci.oxnard.ca.us
111 S. Del Norte Blvd.
Oxnard, CA 93030
(805) 278-8200
Emilia/Brenda

- Natural Gas – Southern California Gas Company
- Propane – Amerigas
- Electrical – Southern California Edison
- Water—City of Oxnard Solid Waste Division
  - 805.385.8060
- Sewer – City of Oxnard Waste Division
  - 805.385.8060

Aqua Mansa Transfer Station (Robert A. Nelson)
www.riversideeca.gov/cure/resources.htm
1830 Agua Mansa Rd.
Riverside, CA 92509
(951)786-0655
(951)786-0544
Admin Office: Bonnie in Acct's Payable – LM 10:32 AM – (909)429-4200

- Natural Gas – Southern California Gas Company
- Electrical – Southern California Gas Company
- Water – Western Municipal Water District
  - (951)789-5000
  - http://www.wmwd.com

Perris Transfer Station (CCR)
1706 Goetz Road
Perris, CA 92572
800-755-8112
waste.jmorelan@co.riverside.ca.us
Ed Campus – LM 10:55 AM, called back 11:09 AM

- Natural Gas – Southern California Gas Company
- Electrical – Southern California Edison
- Water -- City of Water Dept. (is who bills facility)
  - Eastern Municipal Water District (provides water to area?)
  - (951)928-3777
  - http://www.emwd.org
- Sewer -- City of Water Dept. (is who bills facility)
  - Eastern Municipal Water District (provides water to are?)
  - (951)928-3777
  - http://www.emwd.org

Community Recycling and Resource (Sun Valley)
9147 De Garmo Avenue
Sun Valley, CA 91352
(818)767-7511
Jim Brock, Jon Richardson LM 11:23 AM, called Jim Brock again, he provided the following responses.

- Natural Gas – Southern Gas Company
- Electrical – Los Angeles Department of Water and Power (LADWP)
- Water – Los Angeles Department of Water and Power (LADWP)
- Sewer – City of Los Angeles

Prepared for:

The County of Los Angeles
Department of Public Works
and
Los Angeles County Solid Waste Management Committee
/Integrated Waste Management Task Force's
Alternative Technology Advisory Subcommittee

Submitted by:

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Concord, MA 01742
(978) 371-2054

For more information, please visit
www.SoCalConversion.org