

The Alternative

IRTA Newsletter

Volume XVI Number 2

Spring 2007

IRTA Finds Alternatives for Cleanup and Thinning Solvents

IRTA recently completed a project sponsored by Cal/EPA's Department of Toxic Substances Control (DTSC) that focused on finding low-VOC, low toxicity alternatives for consumer product cleanup and thinning solvents. The cleanup solvents are used by consumers and by various industrial firms to clean coating application equipment like spray guns, brushes and rollers. Thinners are used, generally when coatings are applied with spray guns, to thin the coatings so they have the proper consistency. Thinners are also referred to as reducers and retarders.

Cleanup solvents and thinners are sold in hardware stores, home improvement stores and paint supply stores. The California Air Resources Board (CARB) collects information from suppliers of consumer products and determines VOC emissions from the data. In this case, CARB estimates the VOC emissions from cleanup and thinning solvents at about 26 tons per day in California. The solvents used today for these purposes include paint thinner, lacquer thinner, mineral spirits, toluene, xylene, methyl ethyl ketone, methyl isobutyl ketone and hexane. All of these solvents are classified as VOCs and many of them are also toxic. Consumers, workers and community members are exposed to them when they are used.

The aim of the project was to identify, develop, test and demonstrate low-VOC, safer alternative cleanup and thinning materials. IRTA tested a variety of alternative materials in consumer applications where wood, metal and plastic coatings are used. The applications of focus included wood coating, architectural coating, autobody coating and consumer autobody coating.

The alternatives that proved effective

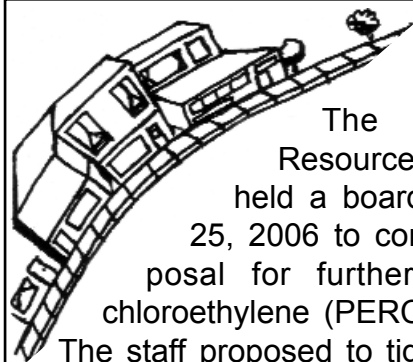
included acetone, a water-based cleaner and blends of acetone with a glycol ether and soy. Acetone is not classified as a VOC and is lower in toxicity than most other organic solvents. Soy has a very low VOC content and CARB does not classify the glycol ether as a VOC; both materials are also low in toxicity. In a few cases, blends of acetone and methyl acetate, another chemical that is exempt from VOC regulations, were effective.

IRTA tested alternatives with wood furniture refinishers and the cleanup materials that proved effective were acetone and a water-based cleaner. For thinning wood coatings, plain acetone, a blend of lacquer thinner with a glycol ether, a blend of acetone and a glycol ether and a blend of acetone and soy were found to be suitable.

Plain acetone was an effective cleanup material and thinner for architectural solvent-borne coatings used by contractors.

Plain acetone proved to be an effective cleanup material for autobody coatings used by autobody shops and by consumers. A blend of acetone and methyl acetate was also effective but, since acetone is less costly and lower in toxicity than methyl acetate, plain acetone should be the choice for this application. For thinning autobody coatings, plain acetone was acceptable for consumer coatings. Other alternatives that were suitable for coatings used in autobody shops included an acetone/glycol ether blend and an acetone/soy blend.

The results of the testing indicate that CARB could regulate cleanup materials and thinners in their consumer products regulation. A VOC content limit close to zero could be established in the regulation. Suppliers could (see *Cleanup and Thinning page 5*)



CARB Phases Out PERC In Dry Cleaning

The California Air Resources Board (CARB) held a board hearing on May 25, 2006 to consider a staff proposal for further regulating perchloroethylene (PERC) in dry cleaning.

The staff proposed to tighten the Airborne Toxic Control Measure (ATCM) that had been adopted in 1993. The proposal would have phased out PERC use in existing co-residential facilities and would have required existing cleaners to adopt secondary controls. It would have allowed most dry cleaners to continue using PERC. The board members unanimously agreed that PERC should be phased out, overruling the staff proposal.

Over the last several months, CARB staff took the board's direction and developed a regulation that phases out PERC. CARB held workgroup meetings and workshops and took public comment on the phaseout regulation. At the public hearing on January 25, 2007, the board approved the amendments to the dry cleaning ATCM.

The new regulation phases out PERC use in dry cleaning altogether by January 1, 2023. The regulation prohibits the installation of new PERC dry cleaning machines starting on January 1, 2008. It forbids the use of existing PERC machines at co-residential facilities by July 1, 2010. Co-residential facilities are defined as facilities that share a wall with, or are located in the same building as, a residence. It also requires that converted machines and machines that are 15 years old or older be removed by July 1, 2010. It further requires that all PERC machines be removed when they become 15 years old. Finally, it expands the good operating practices and recordkeeping and reporting requirements.

The regulation makes a number of changes to the Environmental Training Program adopted several years ago. This program requires a trained operator to be on-site at every dry cleaning facility. The trained operator must take a refresher course every three years. The curriculum for the training will

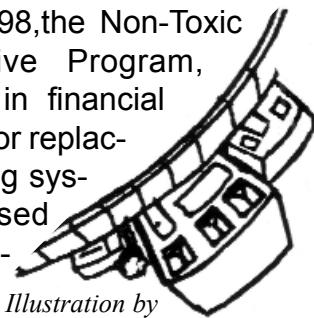
be revised to contain the most current information on the dry cleaning industry, PERC, the alternatives available and the approved amendments to the ATCM. One of the changes is that the trained operator must be on-site while the PERC dry cleaning equipment is in operation. Facilities are no longer required to keep mileage records, but will still be required to report the pounds of garments cleaned and gallons of solvent purchased per year to the local air district. They must also report the model, serial number and date of manufacture of the dry cleaning machine.

The revised regulation has a new recordkeeping provision for PERC distributors. The distributors must maintain monthly records of PERC purchases, monthly records of PERC sold and contact information for each PERC dry cleaner they sell to.

The South Coast Air Quality Management District (SCAQMD) passed a regulation several years ago that phases out PERC in 2020 (see article in this issue). SCAQMD has asked CARB to deem their regulation, Rule 1421, equivalent to the amended ATCM. CARB is evaluating the request. If the SCAQMD rule is deemed equivalent, dry cleaners in the South Coast Basin may have to comply with the provision of Rule 1421 instead of the provisions in CARB's regulation.

All PERC dry cleaners in California will have to convert to alternative technologies over the next several years. Some will have to convert to alternatives in the next few years. There are a variety of alternatives available including wet cleaning, carbon dioxide cleaning, hydrocarbon, Green Earth and Rynex. Through AB 998, the Non-Toxic Dry Cleaning Incentive Program, CARB offers \$10,000 in financial assistance to cleaners for replacing a PERC dry cleaning system with a water-based cleaning or carbon dioxide cleaning system.

Illustration by
(see **Phase Out** page 5) *Todd Schmid*



SCAQMD Proposes Adopting Voluntary Certification Program for Consumer Products

The South Coast Air Quality Management District (SCAQMD) is proposing a voluntary program for certification of consumer cleaning products used at institutional and commercial facilities. The District Governing Board will decide whether to implement the program on April 6.

The voluntary program would apply to several types of products used for various cleaning purposes by janitors at institutional and commercial facilities like office buildings, schools, retail establishments and lodging establishments. These products include air fresheners, bathroom and tile cleaners, carpet and upholstery cleaners, floor polishes or waxes, floor wax strippers, general purpose cleaners, general purpose degreasers, glass cleaners, metal polish/cleansers and toilet/urinal care products. The purpose of the program is to positively influence consumer behavior in selecting ultra-low VOC products and foster the marketing of ultra-low polluting technologies for reducing VOC emissions.

The program would certify products that met certain criteria. One of the most important is that the certified products would have a VOC content less than or equal to 25 grams per liter. Other criteria specify that the product must have less than 0.1 percent of Toxic Air Contaminants, Hazardous Air Pollutants, Ozone Depleting Compounds, Global Warming Compounds, carcinogens and reproductive toxins, heavy metals and U.S. EPA's Great Waters Pollutants of Concern. The District is still evaluating whether to include products that may already be certified by a reputable third party certification organization like Green Seal, U.S. EPA Design for the Environment, GreenGuard or EcoLogo, assuming such products also meets the 25 gram per liter VOC limit.

The program would be modeled after the Clean Air Solvent (CAS) Certification Program established by the District many years ago to cover cleaners used by industrial facilities. In that program, cleaners that are CAS certified must also have a VOC content less than or equal to 25 grams per liter. At this

stage, the CAS Certification Program has certified 140 products provided by 73 participating companies. It has been very successful and many industrial facilities select parts cleaners that are CAS certified.

The District held two workshops to solicit comments on the voluntary program's proposed structure. Many of the participants, including manufacturers and suppliers of the cleaning products, encouraged the District to adopt a regulation rather than a voluntary certification program. They expressed concern that building representatives would not convert to the low-VOC certified products as long as they were not required to do so. The District is evaluating whether to make the program mandatory rather than voluntary.

The California Air Resources Board (CARB) currently regulates the VOC content of consumer products for all of California. The VOC content currently allowed by CARB for many of the products that would be included in the District program is higher than the 25 gram per liter VOC limit that is proposed for certification. If the District found, through this program, that there are many products with lower VOC content, then it might provide impetus to CARB to adopt lower VOC limits for many of the cleaning categories.

The District is also considering establishing an even lower VOC limit for the certified products if many of them prove to have a lower VOC content. As part of the program development, the District collected 17 products that are classified as bathroom cleaners, carpet cleaners, general purpose cleaners, glass cleaners and household cleaners. The District lab tested the VOC content of these cleaners and preliminary results indicate that many of the products have a VOC content less than 10 grams per liter.

People interested in the issue should attend the Governing Board hearing of the proposed program on April 6. For more information, contact Katy Wolf at IRTA at (818) 244-0300.



IRTA Completes Project on TBAC Alternatives

IRTA recently completed a project that focused on safer alternatives to tert-butyl acetate (TBAC). The project was sponsored by U.S. EPA Region IX. The report will be available on IRTA's website by the end of April.

In 2004, EPA listed TBAC as a chemical that is exempt from VOC regulations. Limited toxicity information is available on TBAC itself. TBAC does, however, form a metabolite, called tert-butyl alcohol (TBA), that has induced tumors in rats and mice and is a carcinogen. Researchers from the Office of Environmental Health Hazard Assessment (OEHHA) in California authored a journal article that indicates that TBAC is substantially metabolized to TBA. The authors state that TBAC should be considered to pose a potential cancer risk to humans because of the metabolic conversion to TBA.

TBAC is not widely used today. The chemical is much more expensive than other VOC chemicals like toluene, xylene, MEK and hexane. There would be no reason to use TBAC unless it was exempt from VOC regulations. EPA did exempt TBAC but the California Air Resources Board (CARB) and local air districts must exempt the chemical before it can be considered a non-VOC in California. Exempt chemicals are much more widely used in California than in other states because of California's stringent VOC regulations. TBAC has properties that make it an attractive solvent for cleaning and thinning coatings. If CARB or the local air districts exempted TBAC, it would create a market for the chemical and it might be widely used in a range of different applications.

The motivation for the project on TBAC conducted by IRTA was that TBAC might be used extensively in California if it were exempted. Because using the chemical would pose a cancer risk to workers and community members, IRTA and EPA wanted to identify safer alternatives that could be used in place of TBAC in the applications where TBAC could be used if it were exempted. The project involved analyzing safer alternatives to TBAC in a variety of cleaning and thinning applications including: batch loaded cold cleaning and handwipe

cleaning; printed circuit board defluxing; coating application equipment cleaning; thinners for coatings; automotive aerosol cleaning; lithographic printing cleanup; and screen printing cleanup. The approach involved some limited testing of TBAC in printing cleanup.

IRTA identified effective alternatives in all of the applications and, in many cases, companies have adopted the safer alternatives. The final report details case studies and analyzes and compares the cost of using TBAC and the safer alternatives.

Alternatives that have proven effective in the applications that were analyzed include acetone and acetone blends, water-based cleaners and soy based cleaners. Acetone is not classified as a VOC and is lower in toxicity than most other organic solvents. Water-based cleaners are generally diluted in applications where they are used and many of them have low VOC content and low toxicity. Soy based cleaners, similarly, have low VOC content and low toxicity.

CARB has exempted TBAC for use in their autobody Suggested Control Measure (SCM). CARB develops SCMs for certain types of operations and, although the SCMs are not regulations, they are adopted by many air districts as regulations. CARB exempted TBAC in the SCM for use in all coatings and as a cleanup solvent and thinner.

The South Coast Air Quality Management District (SCAQMD) recently modified their regulation for the autobody industry, Rule 1151. The District did not adopt the exemption for TBAC across the board as CARB did in the SCM. Rather, the District exempted TBAC for use in primers, one type of autobody coating. SCAQMD recently amended their architectural coating rule, Rule 1113. The amendment provides an exemption for TBAC for one type of coating called an Industrial Maintenance (IM) Coating. CARB is currently developing an SCM for architectural coatings but has indicated they will not propose exempting TBAC in any application.

IRTA plans to do some follow-up work

(see **TBAC Alternatives** page 5)

Lithographic Printing Cleanup Solvents Workshop Held in Bay Area

On March 7, a workshop on cleanup solvent alternatives for lithographic printers was held in San Francisco. The workshop, entitled "Safer Cleanup Solvents: What Printers Need to Know," was designed to provide information on alternative, safer cleanup solvents that can be used in lithographic printing.

The project was sponsored by the Alameda County Green Business Program, the City and County of San Francisco, the Northern California Media Workers Union, the California Department of Health Services Hazard Evaluation System & Information Service, the Bay Area Air Quality Management District, the California Department of Toxic Substances Control, the UCB School of Public Health and U.S. EPA Region IX. Attendees included printers, government agency representatives, union members and trade association representatives.

The South Coast Air Quality Management District (SCAQMD) has established lower VOC limits for cleanup solvents used in lithographic printing. Rule 1171 requires that the materials used in cleanup have a VOC content of 100 grams per liter or less by January 1, 2008. The purpose of the workshop in Northern California was to provide printers with information on the lower VOC and safer alternative cleanup solvents that are available for the industry.

IRTA conducted two demonstration projects and worked with 21 lithographic printers in Southern California to identify, develop, test and demonstrate low-VOC, low toxicity cleanup materials. The report summarizing the results of the projects is on IRTA's website at www.irta.us. The alternatives that were demonstrated by IRTA included water-based cleaners, soy based cleaners and acetone cleaners. IRTA provided information on the testing at the workshop.

If you are interested in alternative cleanup materials, call Katy Wolf at IRTA at (818) 244-0300.

TBAC Alternatives (Continued from Page 4)

on TBAC to determine whether it is being used widely in the South Coast Basin in autobody primers or in IM coatings. If suppliers are not relying on TBAC to meet the lower VOC limits, then the exemptions in the District rules are not needed.

For more information on TBAC, call Katy Wolf at (818) 244-0300.

Phase Out

(Continued from Front Page)

The SCAQMD also has a financial assistance program which covers hydrocarbon and Rynex systems as well as the wet cleaning and carbon dioxide technologies. It does not cover Green Earth, however.

The most widely used alternative to PERC dry cleaning is hydrocarbon. Hydrocarbon is classified as a VOC and some of the testimony at the board hearing requested that CARB ban the use of hydrocarbon as an alternative for that reason. The board, however, declined to do that and commented that they would not restrict hydrocarbon during the useful life of the equipment. The resolution, which is part of the final regulation package, indicates that the board "directs the staff to consider the full useful life of equipment in any future rulemakings for this source category." Cleaners who have adopted hydrocarbon have been concerned that it, too, will be regulated. The board comments and the resolution indicate that this is unlikely.

For information on dry cleaning alternatives, call Katy Wolf at IRTA at (818) 244-0300.

Cleanup and Thinning

(Continued from Page 2)

rely on acetone and blends of acetone with small amounts of glycol ether to meet the lower VOC limits. Most glycol ethers are defined as Low Vapor Pressure (LVP) materials in CARB's consumer product regulations and they are not considered to be VOCs.

The report that summarizes the test results is on IRTA's website at www.irta.us. The report also includes a cost analysis and comparison of the high VOC products used today and the alternatives.

If you have questions on the alternative cleanup materials and thinners, call Katy Wolf at (818) 244-0300.

SCAQMD Sends Letter to Dry Cleaners

The South Coast Air Quality Management District (SCAQMD) sent a letter to PERC dry cleaners in late January that provided information on compliance dates for the facilities. Rule 1421 "Control of Perchloroethylene Emissions from Dry Cleaning Systems" phases out PERC in dry cleaning by December 31, 2020. The regulation requires that all PERC machines have secondary control by November 1, 2007. About two-thirds of the PERC dry cleaners in the South Coast Basin do not have secondary control machines. The rule also requires that PERC dry cleaning facilities meet the action

risk limit of 25 in a million cancer risk by November 1, 2007.

The letters sent by the District were sent certified mail with a return receipt requested. Cleaners cannot claim they did not receive the letter. The letter informs the cleaners of the provision in Rule 1421 for secondary control and also specifies a cap in PERC use for each particular facility so the risk level of 25 in a million will not be exceeded. The District determined the use cap by using the information provided by cleaners in the Initial Compliance (see **SCAQMD Letter** page 6)

IRTA to Begin New Laser Stripping Project

IRTA is planning to initiate a new project that involves demonstrating an emerging laser stripping device in selected applications. The project is sponsored by the California Air Resources Board (CARB) under the Innovative Clean Air Technologies (ICAT) program.

IRTA will work with Laser Strip Corporation during the project. Laser Strip has developed a portable, hand-held carbon dioxide laser for stripping paints and other contaminants from surfaces. The light is absorbed by the paints or other contaminants but is not absorbed by the substrate below. The device is capable of removing coatings from surfaces one by one. Although large fixed lasers with automated controls have been demonstrated to strip paint, the innovation of this device is its greater flexibility and portability. The prototype that will be tested fits in the back of a pickup truck.

Many different types of technologies are used to strip paint from surfaces. Examples of these technologies are: manual removal with sand paper or abrasive discs or scraping with wire brushes; abrasive blasting using steel shot, sand, plastic media, wheat starch media, sodium bicarbonate and water; thermal stripping with steam; and chemical methods using methylene chloride or VOC strippers. All of these methods utilize a medium of some kind and all generate a large volume of waste, in many cases, hazardous waste. The laser, because the light used for the stripping does

not contribute to the waste stream, offers a potentially lower cost stripping method.

CARB estimates that particulate matter (PM) emissions, including PM10 and PM2.5, from "Industrial Sources" amounted to about 166 tons per day in 2004 in California. IRTA considers that the laser stripping technology would be suitable for operations designated as "Surface Blasting." On this basis, use of the laser technology could reduce PM emissions in California by about 2.5 tons per day. It could also be used in place of methylene chloride and VOC strippers.

IRTA and Laser Strip plan to demonstrate the prototype technology in at least four applications. Two of the applications are aircraft stripping and water storage tank stripping. Other applications for which the technology could be successful are bridge stripping, ground vehicle stripping, ship hull stripping, ship internal tank stripping, graffiti removal and oil platform stripping.

The demonstrations will determine whether the technology can effectively remove paint. IRTA will compare the performance and cost of the technology to more traditional stripping methods. Laser Strip plans to commercialize the technology after the demonstration project. Rather than marketing lasers for various applications, the company will lease the lasers and/or lease the stripping service to customers.



SCAQMD Letter

(Continued from Page 6)

Report submitted by cleaners by July 1, 2003. The information included the amount of PERC used each year and the distance of the facility to the closest neighbor. The District assumed an average of 56 percent PERC emitted per gallon used. Some cleaners did not provide information and they were given a default cap.

The letter includes a Dry Cleaning Risk Reduction Plan which cleaners must complete and sign. It must be submitted to the District by April 26, 2007 or July 26, 2007 depending on which option the cleaner chooses. For the requirement to have secondary control, the cleaner can add secondary controls to an existing PERC machine, replace the primary control machine with a new secondary control machine or replace the machine with a non-PERC alternative. The risk reduction plan must be submitted by April 26 if the cleaner adds secondary control or buys a new PERC machine and by July 26 if the cleaner plans to replace the machine with a non-PERC alternative.

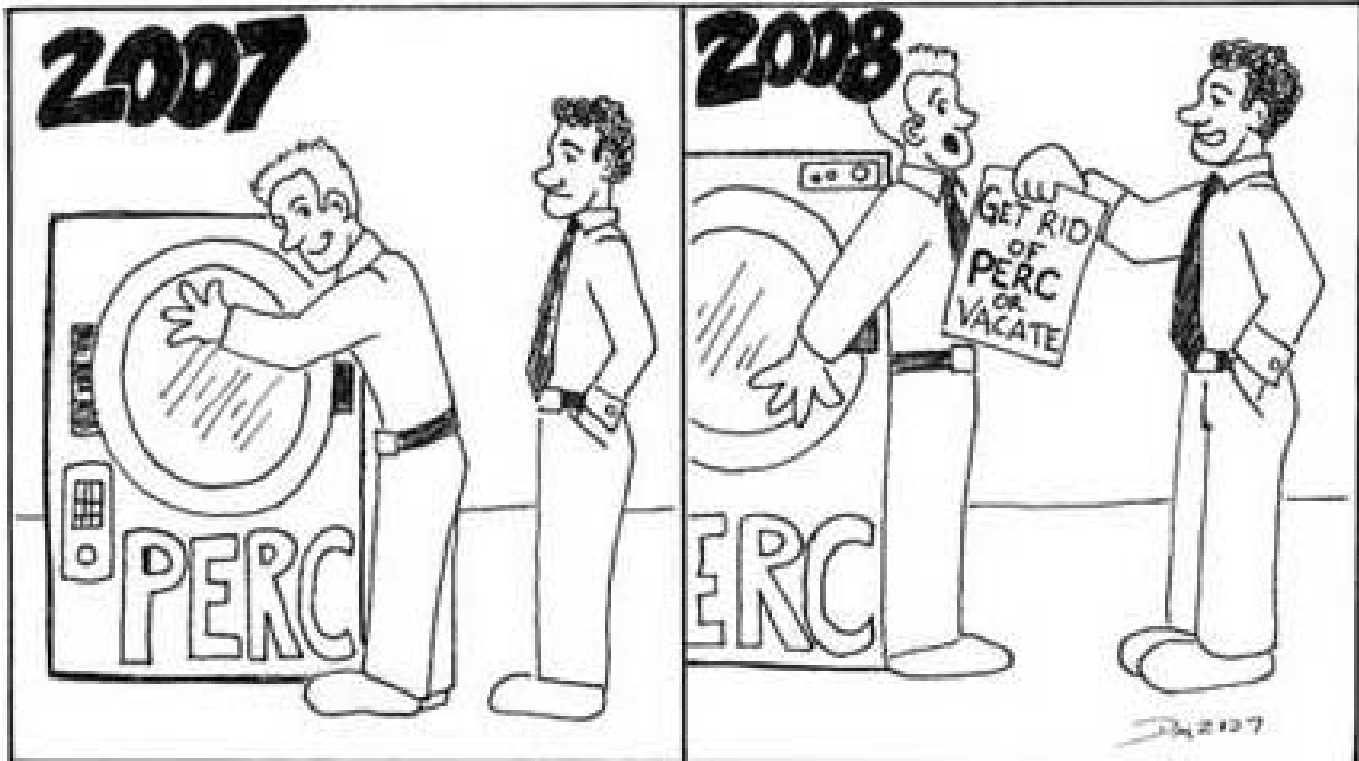
Cleaners must decide whether they can continue using PERC with the cap on PERC

use the District is imposing. In some cases, it will not be enough PERC to do the cleaning. Cleaners should keep in mind that this is a firm limit for their purchases. The new CARB regulation (see article in this issue) requires suppliers to keep records of their PERC sales so cleaners cannot purchase from two suppliers without being found out.

Cleaners should not make a decision to purchase a new PERC machine or add secondary control to an existing primary control machine until they have a conversation with their landlord. If the cleaner's lease is up for renewal before the machine is 15 years old, the landlord probably won't allow the cleaner to continue using PERC. The cleaner will take a big loss if the new PERC machine has to be replaced in the next few years.

The best option for all cleaners is to replace a PERC machine with an alternative. That way, there will be no problems with lease renewal and the cleaner will not have to comply with the requirements of a stringent PERC regulation.

For more information on the SCAQMD regulation, call Katy Wolf at IRTA at (818) 244-0300.



“I bought a new PERC machine to meet the SCAQMD regulation.”

“My landlord said I can’t use PERC anymore for my lease.”

CALENDAR

April 6

South Coast Air Quality Management District Governing Board Meeting, Implementation of Voluntary Certification Consumer Cleaning Products at Institutional and Commercial Facilities. For Information, Call Mike Morris at (909)396-3282

April 26

Deadline for PERC Dry Cleaners to submit information to South Coast Air Quality Management District on secondary control and alternatives options.

April 22

Earth Day

July 18-21

Association of Woodworking and Furnishings Suppliers Conference, AWFS Las Vegas, Las Vegas Convention Center. For Information call (800) 946-2937 or visit www.awfsfair.org

IRTA is working together with industry and government towards a common goal -- implementing sensible environmental policies which allow businesses to remain competitive while protecting and improving our environment. IRTA depends on grants and donations from individuals, companies, organizations, and foundations to accomplish this goal. We appreciate your comments and contributions!

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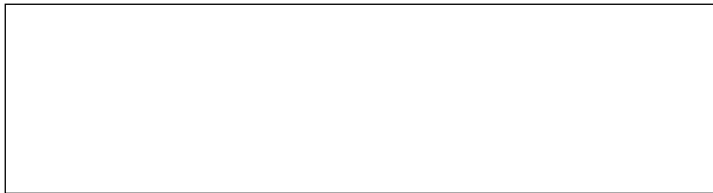
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