Finishing Technologies Certification Program

Table of Contents

Executive Summary

The ***WasteCap Nebraska Finishing Technologies Certification*** program is a mobile training unit developed to instruct members of the surface coating industry using state-of-the-art technology. This hands-on training is vital to assist spray paint technicians in improving their skills. The **VirtualPaint™** system designed by the Iowa Waste Reduction Center will allow technicians to understand, practice, and become proficient with these techniques without the expense related to traditional paint booth training.

The ***WasteCap Nebraska Finishing Technologies Certification*** program will offer training to private businesses throughout the state with technicians receiving a 5-year certification. The training will follow the **Iowa Waste Reduction Center's STAR4D®** military training curriculum with industrial and business modifications provided by Southeast Community College Auto Collision Repair Technology faculty. All instruction will be conducted by experienced members of the surface coating industry. The mobile unit will allow businesses throughout Nebraska to participate without expensive and time-consuming travel. This certification program will be used as an option to satisfy the state hazardous air pollutant best available control requirement as well as the U.S. Environmental Protection Agency (EPA) rule on National Emission Standards for Hazardous Air Pollutants (NESHAP subpart HHHHHH) that mandates training for all surface coating applicators. This EPA rule will directly affect over 500 businesses in Nebraska.

Utilizing this training and certification program provides numerous direct benefits for businesses and the environment. Painters trained using this system can:

- **Increase transfer efficiencies by 19%**
- **Decrease material consumption by 13%, saving $450-1000 in product savings per project**
- **Reduce air emissions by up to 12.6%**

Development of each program participant will be measured before and after training with the **VirtualPaint™** system to monitor individual improvements to transfer efficiencies, average mil thickness, time and ounces of paint sprayed. These individual improvements will lead to increased overall efficiency of spray applications at a business and reduce the waste and hazardous emissions generated.

The ***WasteCap Nebraska Finishing Technologies Certification*** program is made possible through the support of the Nebraska Department of Environmental Quality, the Lincoln-Lancaster County Health Department, Southeast Community College, Stephenson Truck Repair, General Dynamics, and WasteCap Nebraska. Additional corporate sponsorships are necessary to fulfill program goals.

Program Goals and Benefits

The goal of the certification program is to:

- **Provide hands-on surface coating application instruction to industry technicians to improve their painting techniques**
- **Decrease material consumption and hazardous emissions**

This will be accomplished by utilizing the **VirtualPaint™** system designed by the Iowa Waste Reduction Center. Development of each program participant will be measured before and after training with the **VirtualPaint™** system to monitor individual improvements:

- to transfer efficiencies
- average mil thickness
- time and ounces of paint sprayed

These individual improvements will lead to increased overall efficiency of spray applications at a business and reduce the waste and hazardous emissions generated and released into the environment.

The **VirtualPaint™** system has been found to **increase the efficiency of transferring coating products** to prepared surfaces **by 19%**. As efficiency increases, the amount of **material consumed decreases by 13%**.

The average car door generally requires 9 coats of various materials, and depending on the paint gun used, may use 25-63 ounces of products and cost between $73-124 for materials alone. Larger commercial projects can easily average $3500-8000 for materials so decreasing material consumption by 13% would provide a $450-1050 product savings.

The savings from the training can also be seen in reduced hazardous waste generation which currently costs $240 for the removal of a 55-gallon drum of waste products. Through training with the **VirtualPaint™** system, the amount of **volatile organic compounds (VOCs) released decreases by 12.6%**.

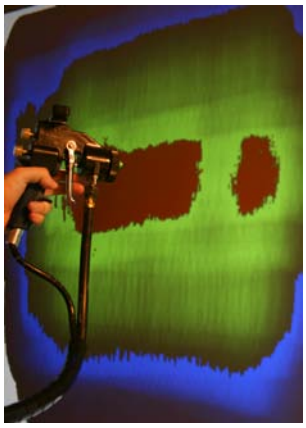
The **reduction in air emissions and hazardous waste benefits** not only the individual business who implements the training but **residents throughout Nebraska** as well. Most paints used in the automobile and manufacturing industries contain volatile organic compounds and hazardous air pollutants. Volatile organic compounds contribute to the formation of ozone, which aggravate chronic heart disease, asthmas, bronchitis, and emphysema. In **2002**, an **estimated 10,148 tons of volatile organic compounds** were emitted from surface coating facilities in Nebraska. This is approximately 10% of all volatile organic compound emissions in the state. **Hazardous air pollutants** are known or suspected to cause cancer or other serious health issues such as reproductive effects or birth defects. These pollutants were emitted by Nebraska surface coating facilities at an estimated rate of **2,556 tons in 2002** which is approximately 10% of all hazardous air pollutant emissions.

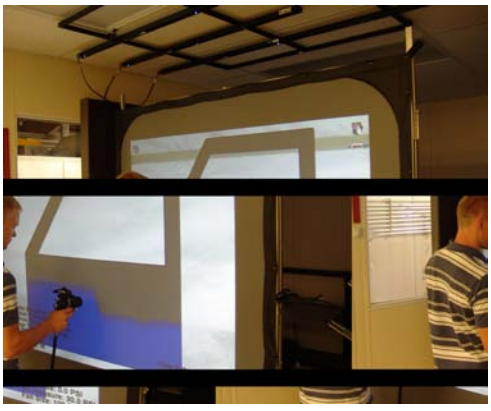
Technology

The **VirtualPaint™** technology uses a high volume low pressure (HVLP) spray gun coupled with precise software modeling to track and project the user's spray techniques onto an interactive display. The user is able to view and interact with real equipment while simulating the coating application on a virtual surface eliminating the need for a paint booth, safety equipment, operational hazards and hazardous waste and emissions generation.

Specifically, the tracking system continuously traces the position and orientation of the spray gun to the virtual surface. When the spray gun trigger is pulled, a signal is instantly sent through a connection to the computer. The **VirtualPaint™** software program determines the spray pattern distribution, wet mil accumulation, transfer efficiency and amount of material sprayed. The computer then communicates to the projector, which displays the **VirtualPaint™** training system onto a rear projection screen. The component details include:

- **Paint model** – an advanced paint model is used to accurately represent real paint application. This model was designed from research and testing performed by the Iowa Waste Reduction Center on spray gun settings, application techniques and performance efficiencies. The simulated coatings imitate real spray patterns at various spray gun settings and coverage showing the proper wet mil thickness.
- **Spray gun** – **VirtualPaint™** uses a real pressure feed conventional HVLP air spray gun. This gun has been uniquely instrumented so an operator has full control over the fluid flow adjustment, fan pattern adjustment, air pressure and trigger variability, similar to the actual spray gun. The spray gun is also equipped with a tracking device that rests on top and communicates with the overhead transmitters to track the position and orientation of the spray gun.
- **InterSense PCTracker** – the tracking system combines inertial and ultrasonic tracking technologies. The overhead SoniRails each contain three transmitters that dispatch a high frequency sound that is received by the tracking device on top of the spray gun. When the spray gun tracking device receives the high frequency sounds, it communicates the position and orientation of the spray gun to the computer.





Instruction

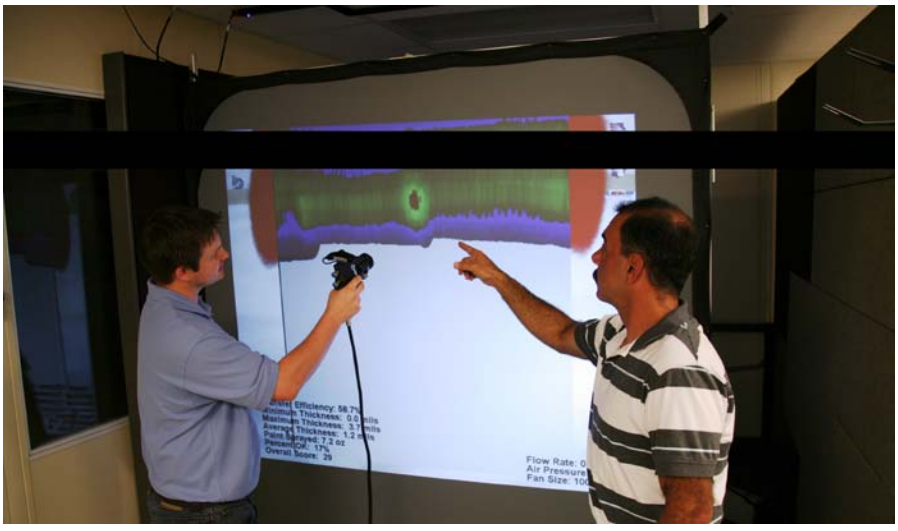
All instruction will be conducted by experienced members of the surface coating industry and will follow the **Iowa Waste Reduction Center's STAR4D®** military training curriculum, with industrial and business modifications provided by Southeast Community College Auto Collision Repair Technology faculty.

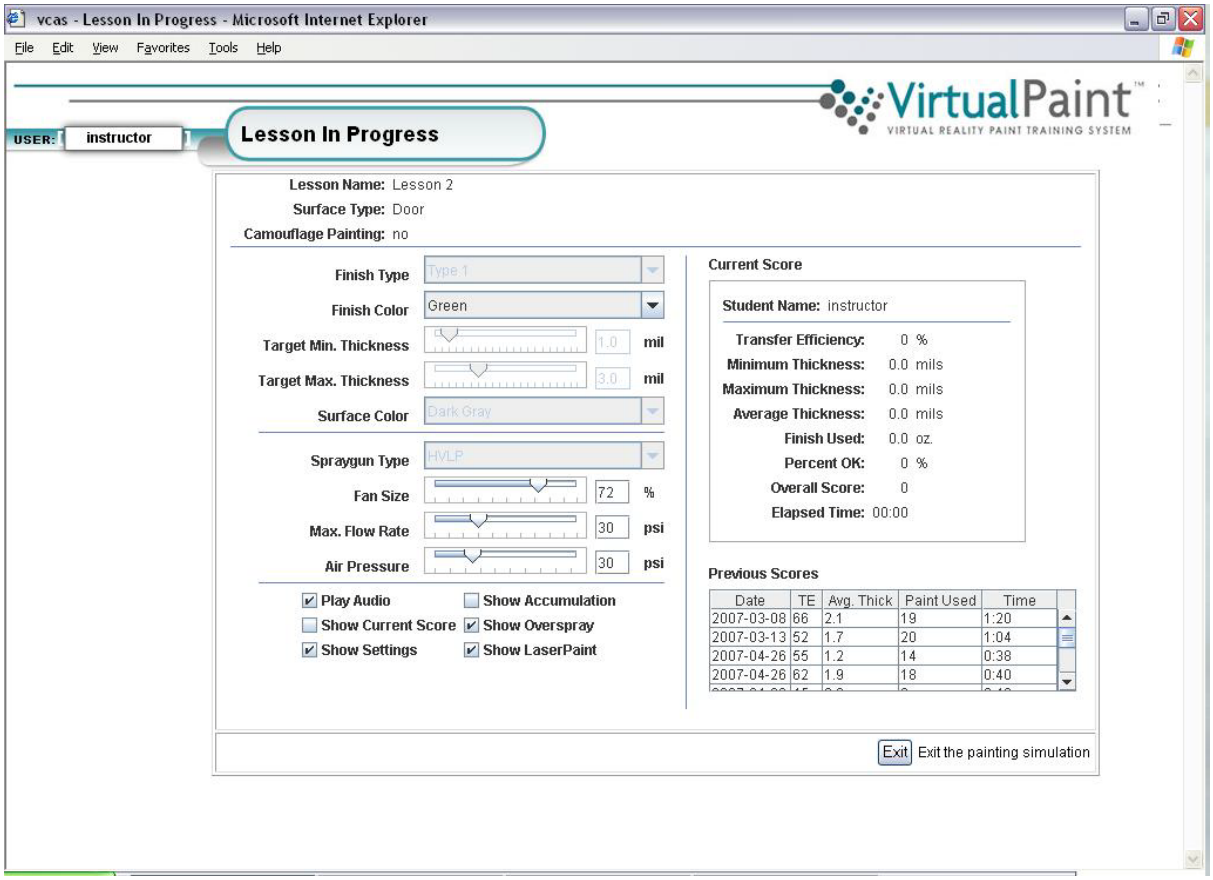
The **VirtualPaint™** system allows realistic hands-on training while providing technicians with instant performance feedback.

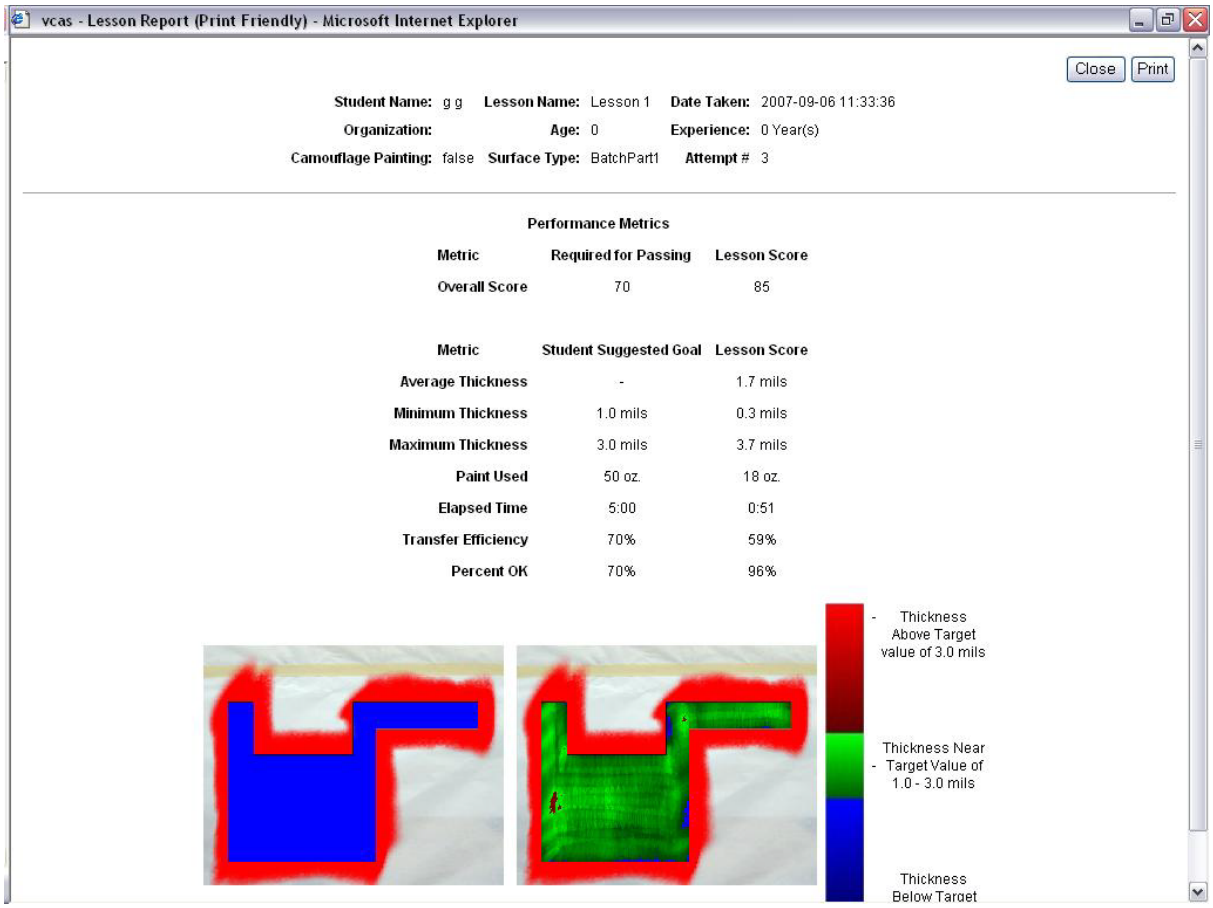
The course addresses concepts such as fluid and air pressure adjustment, fan pattern adjustment, spray pass overlap, lead and lag of spray gun triggering, spray speed and distance and paint planning strategies may be taught using this system. Spray gun settings such as air pressure, coating flow rate, and fan pattern size are displayed on the screen to enable trainees to learn to properly adjust equipment. Visual feedback on coating accumulation is available through multi-color display modes indicating coating thickness levels. Performance is graded through transfer efficiency, mil build average, elapsed time, overspray and amount of paint consumed.

Subjects covered during the training include:

- **Safety and environmental impacts**
- **Spray booth and filter maintenance**
- **Coating basics**
- **Coating defects-failures**
- **Surface preparation**
- **Spray application equipment**
- **Spray equipment set up**
- **Spray techniques**




vcas - Lesson In Progress - Microsoft Internet Explorer
File Edit View Favorites Tools Help
VirtualPaint
VIRTUAL REALITY PAINT TRAINING SYSTEM
USER: instructor
Lesson In Progress
Lesson Name: Lesson 2
Surface Type: Door
Camouflage Painting: no
Finish Type
Type 1
Finish Color
Green
Target Min. Thickness
1.0
mil
Target Max. Thickness
3.0
mil
Surface Color
Dark Gray
Spraygun Type
HVLP
Fan Size
72
%
Max. Flow Rate
30
psi
Air Pressure
30
psi
Play Audio
Show Accumulation
Show Current Score
Show Overspray
Show Settings
Show LaserPaint
Current Score
Student Name: instructor
Transfer Efficiency: 0 %
Minimum Thickness: 0.0 mils
Maximum Thickness: 0.0 mils
Average Thickness: 0.0 mils
Finish Used: 0.0 oz.
Percent OK: 0 %
Overall Score: 0
Elapsed Time: 00:00
Previous Scores
Date TE Avg. Thick Paint Used Time
2007-03-08 66 2.1 19 1:20
2007-03-13 52 1.7 20 1:04
2007-04-26 55 1.2 14 0:38
2007-04-26 62 1.9 18 0:40
Exit
Exit the painting simulation


vcas - Lesson Report (Print Friendly) - Microsoft Internet Explorer
Close
Print
Student Name: g g
Lesson Name: Lesson 1
Date Taken: 2007-09-06 11:33:36
Organization:
Age: 0
Experience: 0 Year(s)
Camouflage Painting: false
Surface Type: BatchPart1
Attempt # 3
Performance Metrics
Metric Required for Passing Lesson Score
Overall Score 70 85
Metric Student Suggested Goal Lesson Score
Average Thickness - 1.7 mils
Minimum Thickness 1.0 mils 0.3 mils
Maximum Thickness 3.0 mils 3.7 mils
Paint Used 50 oz. 18 oz.
Elapsed Time 5:00 0:51
Transfer Efficiency 70% 59%
Percent OK 70% 96%
Thickness Above Target value of 3.0 mils
Thickness Near Target Value of 1.0 - 3.0 mils
Thickness Below Target

Certification

The ***WasteCap Nebraska Finishing Technologies Certification*** program will be a mobile unit that can service businesses and community colleges throughout the State of Nebraska and will offer a 5-year certification. There are 95 state regulated surface coating facilities in Nebraska with another 15-20 regulated businesses in Lincoln-Lancaster County and Omaha that could utilize the **VirtualPaint™** system. In addition, there are approximately 500 auto body shops of various sizes in Nebraska who would be part of the initial target groups and are covered under the EPA rule mandating painter training. Nebraska also has 6 community colleges with programs to train spray technicians, and it is estimated that training at Southeast Community College and the other members of the community college network in Nebraska would impact 80 of the industry's newest professionals each year. The training will also be offered at air quality workshops hosted by NDEQ across the state and should educate 40 people per year. An additional 400 people per year can be educated in an estimated 26 weeks of training. Initial training is expected to begin in summer 2008.

The VirtualPaint™ system was originally designed for use in certifying painters in the U.S. military. This includes painters meeting the strict specifications of painting the Marine One Presidential Helicopter.

Sponsorship Opportunities

The U.S. Environmental Protection Agency (EPA) rule on National Emission Standards for Hazardous Air Pollutants (NESHAP subpart HHHHHH) requires that; all surface finishing technicians who apply certain classes of paints and/or strippers must achieve certification. Certification must be achieved by January 10, 2011.

This rule affects approximately 600 businesses and thousands of technicians across Nebraska. To assist members of the surface coating industry attain compliance, the Nebraska Department of Environmental Quality (NDEQ) awarded an $115,000 grant to WasteCap Nebraska in July 2007to:

- purchase the VirtualPaint training system
- develop and modify a curriculum with qualitative testing that fulfills EPA and NDEQ Air Quality Training Requirements
- originate and manage a certification program

The grant requires matching contributions of financial resources to assist in project implementation.

Corporate sponsorship of the ***WasteCap Nebraska Finishing Technologies Certification*** program provides an excellent promotional opportunity for businesses who wish to reach this captive audience. Please contact WasteCap Nebraska at 402-434-7376 or 888-EWASTE9 with any questions.

This is a mock up of the WasteCap Nebraska Finishing Technologies Certification program mobile trailer. Your logo could be featured prominently with your sponsorship of the program.

WasteCap Nebraska Finishing Technologies Certification Program
Sponsorship Levels

	$100,000	$50,000	$25,000	$15,000	$10,000	$7,500	$5,000	$2,500	$1,000
Logo on trailer (logo height)	50"	42"	36"	24"	18"	12"	8"		
Logo placement on trailer	both sides & rear door	both sides	side & rear door	one side or rear door	one side or rear door	one side	one side		
Name on plaque inside trailer	•	•	•	•	•	•	•	•	•
WasteCap Nebraska membership for 1st year	$5,000 level	$3,000 level	$1000 level	$500 level	$500 level	$250 level	$250 level	$100 level	
Use of equipment by business (wks. per year)	2.5	2	1.5	1	0.5				
Acknowledgement in all training materials	•	•	•	•	•	•	•	•	•
Acknowledgement in all promotional materials	•	•	•	•	•				
Slide show advertisement during training breaks	Multiple slides	Multiple slides	Individual slide	Individual slide	Individual slide	Several business slide	Several business slide	Several business slide	Multiple business slide
Logo on instructor's uniforms	•	•	•	•	•				
Logo/acknowledgement on the WasteCap Nebraska VirtualPaint sponsors website with logo/link to company website	•	•	•	•	•	•	•	name with link	name with link
Logo/acknowledgement on the WasteCap Nebraska VirtualPaint training home page with logo/link to company website	•	•	•	•	•				

All sponsorships cover a 5 year time period from the date of contract but must be paid in full during year one of the contract.

Sponsor levels as of May 2, 2008

Program Partner Profiles

The ***WasteCap Nebraska Finishing Technologies Certification*** program involves a unique partnership between public, private, non-profit and governmental entities including participants from Southeast Community College, the Lincoln-Lancaster County Health Department, Stephenson Truck Repair, General Dynamics, the Nebraska Department of Environmental Quality (NDEQ), and WasteCap Nebraska.

Carrie Hakenkamp, Executive Director for WasteCap Nebraska has a Bachelor of Arts in Environmental Studies with an emphasis in Sociology from the University of Nebraska at Lincoln and has been involved in recycling and environmental issues for over ten years. She has been the Director of WasteCap Nebraska since 1998. In that time, WasteCap has performed over 100 waste assessments for businesses, hosted over 25 workshops and educational tours, and written 12 publications for business recycling. Ms. Hakenkamp has served as the co-chair of the Rural Recycling Council for the National Recycling Coalition, served as Project Manager for the Nebraska Mobile Environmental Education Center, has developed numerous training programs and is currently serving as Chair of the Nebraska Industrial Coalition on Environment (NICE).

Sue Ellen Pegg has served as **Technical Assistance Coordinator for WasteCap Nebraska** since December 2005. During that time, she has conducted waste assessments, provided outreach and member services, and performed market research. Sue Ellen holds a Bachelor of Science in biology and has a background in agricultural research at both the university and industry level. Her past experiences also include work in membership, fundraising, and grant writing for a non-profit educational organization, the Illinois Agricultural Leadership Foundation.

Dick Stephenson is the owner of **Stephenson Truck Repair,** a Lincoln business providing mechanical and body repair services for commercial vehicles. He has 25 years painting experience and has owned his own business for over 40 years. Dick received training at the Aberdeen, Maryland Proving Grounds as well as through a variety of technical courses. He has painting certifications from Sherwin-Williams and DuPont.

Bill Vocasek is the **Program Chair of the Auto Collision Repair Technology Department of Southeast Community College – Milford** and has held that position since 1998. He is a 1977 graduate of that program and a 1979 graduate of the Auto Mechanics program at Southeast Community College. He has worked for 30 years in auto collision repair including 12 years as a collision repair technician and body shop manager and 8 years as an instructor at Southeast Community College in Structural Repair Technology. Bill is an I-CAR Welding Qualification Instructor & Test Administrator and a 3M Qualified Respirator Fit Test Administrator. In addition, he holds the I-CAR Platinum class individual

certification and is an ASE Master Certified Collision Repair & Refinish Technician, a PPG Certified Refinish Technician, and a DuPont Certified Refinish Technician.

Jim Newman is an **Environmental Health Specialist II** for the **Lincoln-Lancaster County Health Department**. He serves as the interim pollution prevention coordinator and also works in the water quality section. Jim graduated from the University of Nebraska-Lincoln in May 2005 with a B.S. in Natural Resources. He has also worked for the City of Lincoln from 1994 to 1999 as an Environmental Compliance Technician at the Lincoln-Lancaster County Sanitary Landfill, for the City of Lincoln Water System from 1999 until 2001 as an Environmental Laboratory Technician at the Water Production Facility in Ashland, Nebraska, and for the Lower Platte South Natural Resources District from 2001 until 2005 as a Water Resources Technician/Conservationist.

Melissa Ellis is an **Environmental Assistance Coordinator** for **NDEQ's Air Quality Division**. She has worked in the Division for 12 years. During that time, she has served as a compliance inspector, ethanol industry compliance expert, asbestos program coordinator, and air toxics program coordinator. Since 2000, Melissa has been in charge of air regulatory compliance assistance, outreach coordination, guidance document development, website coordinator, and editor of the semi-annual Air Division newsletter.

John Hetcko represents **General Dynamics**, a manufacturer of composite aerospace and defense products ultimately used by the federal government. John is the **Environmental Health and Safety Manager** for the Lincoln Operations, a position that he has held for over 23 years. He is a Certified Safety Professional and a Certified Hazardous Materials Manager. His experiences at General Dynamics have been in all facets of safety and environmental issues that may impact the operations from worker compensation claims, testifying at OSHA and NDEQ regulatory hearings, and environmental permit preparation. John currently is the president of the WasteCap Board and Chairman of the Lincoln/Lancaster Health Department's Quality Improvement Council.

Stephenson TRUCK REPAIR

Nebraska Department of Environmental Quality

GENERAL DYNAMICS
Armament and Technical Products

Southeast community college
www.southeast.edu

Contact Information

WasteCap Nebraska is a nonprofit organization that provides confidential, non-regulatory waste reduction and recycling services to Nebraska businesses. WasteCap offers on-site assessments, employee training, workshops, and product recycling research as well as recycling contract management services. WasteCap Nebraska's mission is to provide resource conservation assistance to Nebraska businesses. WasteCap's goals are to serve as a proactive catalyst for Nebraska businesses and institutions for the conservation of resources and to facilitate partnerships and coordinate resources to increase the value and marketability of recycling commodities and access to recycling services. WasteCap has been providing recycling support to Nebraska businesses for 13 years, and the **VirtualPaint™** system will allow a new pollution prevention focus.

WasteCap Nebraska
285 S. 68th Street Place, Suite 540
Lincoln, NE 68510

Phone: 402-436-2383
Toll free: 888-EWASTE9
Fax: 402-434-7375
Email: rbeckman@wastecapne.org
Web address: www.wastecapne.org