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Michele Curreri:

Welcome to the *Indoor Air Quality Tools for Schools* Technical Webinar Series. Today's presentation is entitled "Integrated Pest Management in Schools," and I am Michele Curreri and I am from the United States Environmental Protection Agency's *Indoor Air Quality Tools for Schools* Program. Thank you all for taking time out of your busy schedules to attend this exciting and interactive webinar. Let's get started with a polling question. Going to open the polling... great, so our first polling question is "what is your experience with EPA's *Indoor Air Quality Tools for Schools*?" The polls are open if you will just click on the one that best suits your experience, and we'll go ahead and keep the polls open for a few minutes. Terrific; we are going to go ahead and close the polls. And we have some great results. Many of you don't know a lot about *Tools for Schools*, so we are very excited that you are on today's call and you will hear a little more about it, about 35 percent; about 33 percent know a little bit and you have a Kit, but you haven't used it. And those of you that the Kit is a part of your foundation program, 8 percent, thank you so much, and let's continue on.

I'd like to take a few minutes now to review the *Indoor Air Quality Tools for Schools* Program; how it got started; what are the elements of the program and its purpose; and how it's helped schools manage their indoor environments. The program began in 1995 with the release of the *IAQ Tools for Schools* Action Kit. The Action Kit is an evolving resource that continues to be a strong foundational element of the program. It provides best practices, walk through checklist, industry guidelines and sample policies, and sample IAQ management plans to help schools and school districts take immediate action to implement effective IAQ management programs. The *Tools for Schools* Program was implemented successfully in tens of thousands of schools nationwide, and we've learned a great deal about what it takes to create indoor air quality programs that deliver the remarkable health and environmental results schools seek.

Here we've got the *Indoor Air Quality Tools for Schools* Framework. EPA organized the knowledge that we've found from these thousands of schools that are implementing programs into a framework of proven solutions—the Framework for Effective School IAQ Management. The Framework provides a common language to describe the drivers of IAQ program success and offers details on guidance of the proven strategies, organizational approaches, and leadership styles that are fundamental to program effectiveness and presents a clear vision of the pathway to school IAQ excellence. Its highly flexible and adaptive structure allows any school regardless of where you are located, your size, your budget and the condition of your facility to use the Framework to launch or to reinvigorate and to sustain an effective IAQ management program.

Now we will go into a little more detail about the Key Drivers. So by applying this cycle of continual assessment, planning, action and evaluation, the Six Key Drivers work together to deliver effective IAQ school management programs. The first Key Driver is organizing your program; the second, communicating with everyone all the time, assessing your school IQ environment and how occupants are doing continuously; planning your short-term and long-term actions based on your assessments and other important factors; acting to solve or prevent IAQ problems, and addressing structural, institutional and behavioral issues; and finally evaluating the results and the impact your program is having so you can continuously improve your program.

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Now we are going to go onto the Six Technical Solutions. These define the most common issues that schools need to address to effectively maintain your IAQ risks. When addressed systematically and aggressively, an IAQ program that focuses on these Six Technical Solutions will deliver a healthier school environment. Now we will go into a little bit more detail about what we mean by these Six Technical Solutions. The first is ensuring quality inspection, operation and maintenance of your heating, ventilation and air conditioning system. You must act and aggressively control the moisture and mold in your school's facilities. Strong integrated pest management is the third technical solution. The next is effective and consistent cleaning and maintenance activities; then using smart, low emitting, low toxicity materials; and then finally, aggressively controlling the sources of indoor pollutants—for example, anti-school bus idling policies, radon testing or proactively managing your school chemical inventory. Now you might be thinking, why IPM? Why is this a part of this? Well, integrated pest management is one of the components of your environmental management that EPA considers to be most critical to effectively addressing indoor air quality and environmental risks in your school facilities. There are a few reasons: for better or worse, children spend most of their time indoors. Children are also more sensitive than adults to pesticides as they tend to be in closer contact with contaminated surfaces, and their lungs are more susceptible to these pollutants. Given their sensitivity, it is important to put safe measures in place and reduce the necessity of pesticide use and promote pest prevention through common sense and cost-effective strategies. By implementing and institutionalizing a pest management program, your school can reduce sources of food, water and shelter for pests. Integrated pest management is an important part of proactively managing your indoor air quality. During today's webinar, you will learn about the resources and knowledge you need to either start implementing an integrated pest management program or to improve your existing program. So let's get started.

Today's webinar will introduce you to the fundamentals of pest prevention in the school environment. You will discover the relationship between pest prevention methods, asthma triggers and allergic reactions. You will learn safe and cost effective integrated pest management approaches for your school; you'll learn about integrated pest management educational and training tools for your school facilities, faculty, maintenance and facility staff; and finally, you'll have the opportunity to have your questions answered by national integrated pest management experts. So let's do another polling question, but focused on integrated pest management. And the polls are open; the question is "how confident do you feel in your school's approaches to pest prevention?" We'll give it a few more seconds. Ok, we're going to go ahead and close the polls. Great, we've got some interesting results here. About 40 percent of you are excited to learn more strategies; so congratulations and thank you so much for being on this call because you're going to learn a lot today. About 20 percent of you are not very confident, but you are eager to learn more; about 22 percent of you are more confident in facing your challenges; and 19 percent of you are very confident in your abilities to prevent pests.

So it is my pleasure to introduce our expert speakers today, and our first expert speaker is Sherry Glick. She is from the Office of Pesticide Programs Environmental Stewardship branch of the Environmental Protection Agency, the Bio-pesticides and Pollution Prevention Division. She has been working on school IPM programs for over a decade. Not only is school IPM her job, but it's her passion and she continues to protect children from pesticide risks and provide safe learning environments for all children. Our next speaker today, following Sherry, will be Dr. Thomas Green. He is the president of the Integrated Pest Management Institute of North America, a non-profit organization that he co-founded in 1998. The Institute's mission is to leverage marketplace power to improve health, environment, and economics

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and agriculture in communities. The Institute operates the IPM Star program evaluating and certifying schools nationwide for their pest management practices and impacting more than two million children since its inception in 2003. Our third speaker today is Gregg Smith. He has been the director of facility services for the Salt Lake City School District for the past 14 years. Under Mr. Smith's leadership, the facility services department has implemented numerous environmental initiatives to promote and maintain safe and healthy schools, including indoor air quality, integrated pest management, energy conservation, recycling, green cleaning, radon testing, mercury and chemical cleanup, and the ENERGY STAR partnership. He's got his district in with the EPA's *Indoor Air Quality Tools for Schools*' National Excellence Award in 2003 and directed their efforts to implement nationally recognized integrated pest management programs where he received the IPM Star Certified in 2008. And we will end today with our last speaker, Mr. Bob Stoddard. He is the president of EnviroSafe Inc; it's a Michigan-based company that provides safer pest and turf management services to over 70 school districts. Before starting EnviroSafe Inc, Bob spent 14 years as the IPM coordinator for Graham Roberts public schools in Michigan where he got his experience in developing state-reviewed IPM plans. He has testified on behalf of IPM in front of state legislators, and he has spoken at numerous conferences nationwide to support the ongoing adoption of strong school IPM programs. So without any further delay, I am going to turn it over to Sherry Glick who is going to go ahead and start with our presentation. Thank you, Sherry.

Sherry Glick:

Thanks Michele, and thanks to the EPA's *Tools for Schools* Program, and the Indoor Air Quality Office for giving us this exciting opportunity to talk with you about integrated pest management in schools. School IPM is a key component to this *Tools for Schools* Program, like Michele was saying. But more than a component, school IPM is one of the six integral Technical Solutions for indoor air quality management. There are many parallels between pest management practices for good indoor air quality and for pest management. Both of these programs are essential for healthy schools and can reduce asthma incidences for our children. Twenty percent of the U.S. population, nearly 55 million people, spends most of their days in our elementary and secondary schools. Students are at greater risk for exposure because of the hours spent in school facilities and because children are especially susceptible to pesticides and their effects.

I was talking about a parallel between the indoor air quality and with pest management. Well, IPM does stand for integrated pest management and pesticides are powerful tools for controlling pests. However, pesticides need to be used carefully and judiciously, especially when they are used in sensitive areas where children are present. Children are more sensitive to pesticides than adults, and young children can have great exposure to pesticides from crawling, exploring or other hand-to-mouth activities. The U.S. EPA recommends that schools use integrated pest management. Using IPM tactics will help reduce pesticide risks and exposure to children. Put simply, IPM is a safer and usually less costly option for effective pest management in a school community. A school IPM program uses common sense strategies to reduce sources of food, water and shelter for pests in your school buildings and grounds. An IPM program takes advantage of all pest management strategies, including the judicious and careful use of pesticides when necessary.

The next slide is actually a pyramid, and it's going to help us better understand what IPM looks like. And in this slide here you will notice the largest part is at the bottom and represents education and communication. By attending this seminar today, you are taking initial steps to beginning or enhancing

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your school's pest management program. You will learn in today's webinar that good communication is essential for a good integrated pest management program at your school. Also at this webinar today you will learn that sanitation is key to practicing IPM. Our speakers will focus on several maintenance and cultural practices to implement IPM in your school. One further note is that pesticides are also part of this pyramid; it's at the top. It's a small part, but you need to use them only when other IPM tactics have been tried and failed.

Alright, I'm from EPA so let's talk about the next slide. We have many participants on this call today who are really outside the D.C. beltway, and this slide represents our school IPM regional contacts with EPA. Right now, we don't have someone in Region 9 so those folks out on the west that don't have anyone will hopefully soon have someone, but Dr. Green is also going to be providing other contacts through our National School IPM Working Group who you could contact as well if you wanted to get involved and learn more about school IPM.

And then the next slide, today's presentation we are going to talk about what IPM is and what it isn't. You are going to hear from three experts who are doing IPM; you will be hearing interesting perspectives from folks who you can identify with including a school's facilities manager, a pest management professional and the bug doctor, Dr. Tom Green who will be presenting next. Thank you.

Dr. Tom Green:

Ok, well, as during the introduction, the IPM Institute mission was introduced. We've won a number of awards from EPA and also are gold-level members of the Pesticide Environmental Stewardship Program, a great voluntary partnership program that is offered by the Environmental Stewardship branch at EPA. It provides the framework for measuring your progress and risk reduction and also a liaison at EPA, and Sherry Glick has served as ours for a number of years and has just been a tremendous help for our organization and the school IPM effort nationally, so thank you Sherry, and thanks to all our participants and Michele and Pat and all those who make this possible.

So as you heard, strong IPM is one of the Six Technical Solutions for *Tools for Schools*, and it's really important to think about strong IPM because IPM is a collection of tactics that we can use to reduce pest and pesticide risks at our schools—and we're all using a little bit of IPM these days. Strong IPM conveys that we are really putting together all the important pieces of IPM that we will talk about today in an integrated program.

So why is IPM important? Well, it's all about risk reduction from both pests and pesticides, and it's ultimately about improving our performance in schools. For example, if we can reduce staff and student absences by reducing pest-related asthma, or head lice, for example, it stands to reason that our students are going to perform better at school.

Next slide, so what are the risks that we are talking about here in terms of the consequences of poor pest management? Well, if you have flies in your kitchen, who knows where those flies have been before they are landing on your food and food preparation surfaces and potentially leaving bacteria behind that they picked up from floor drains, for example, or from trash outside the building? And when someone gets sick in the school, it is very hard to bring that sickness down to a food safety incident. So with flies in our kitchen, we are at risk of those types of things. If we have mice and rats in our building,

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they love to chew on wires, which can cause short circuits and fires. In the worst case, we've had schools closing due to pest issues, in the kitchen for example, or misuse of pesticides and we've definitely seen too much of both.

Next slide. So what is IPM then? Really, the focus is on long-term prevention, and asking the question, "why is the pest there?" IPM is not anti-pesticide. Pesticides will always be needed when non-chemical approaches are inadequate to manage the pest problem. But we can be very smart about using those pesticides that are least toxic and also reduce potential for exposure. Our pesticide manufacturers have really responded over the last 30 years and introduced many reduced-risk products that are less toxic—things like bait or a small amount of insecticide is included in a food bait station, for example, can greatly reduce potential for exposure and even be more effective than sprays, for example, for cockroaches. The bottom line with IPM—we don't want to attract pests for our schools; we want to keep them out; and we want to get rid of them with the safest, most effective method possible.

The next slide. So again, why is school IPM so important? Well, number one: IPM is more effective than a conventional approach which might include coming into a school on a regular basis, on a weekly or monthly basis, and spraying pesticides without regard to what's going on in the school. IPM schools have fewer cockroaches for example, than schools that are sprayed on a regular basis. IPM is a great step to your overall healthy schools and green schools initiative, because of the risk reduction from both pests and pesticides. IPM is very cost-effective. For example, installing door sweeps on the bottoms of your exterior doors to close up that gap between the door sill and the bottom of the door has been shown to reduce your pest complaints by up to 65 percent. So just think of that small investment, that upfront investment in door sweeps, reducing all the time it takes to deal with a pest complaint when it occurs and the distraction that occurs when you have ants or mice or roaches running through a classroom—very cost-effective, can be an upfront investment, but they really pay off in the long run. And as we heard before, children are especially vulnerable to all toxins, including pesticides because of their developing systems, and because of their behaviors that put them in contact with places in the school where pests or pesticides may be present. And then finally, IPM works in homes too. And our schools are great places for kids to learn about IPM and how it can help them manage pests in their home and future work environment.

Next slide. So we have heard some about asthma and asthma triggers. Leading causes are cockroaches, rodents and dust mites. And when kids grow up being exposed to those allergens, they are at higher risk of asthma, and these exposures can also trigger asthma attacks in school. So it's a tremendous reason for us to be concerned about effective pest management.

Next slide. So getting down to the nuts and bolts then—what are we talking about? Number one: improving sanitation and removing access to food, for example. If you don't do anything else after this webinar, go into your kitchen and particularly look into the floor drain areas of your school kitchen where food is normally prepared. If there is organic matter building up in those drains and they are not being cleaned on a regular basis, it not only provides food for things like mice, cockroaches and ants, but it can also provide a breeding place for flies. Fruit flies, drain flies and other small flies will actually lay their eggs in that organic matter. The maggots will develop there and emerge as flies, and then of course they are up on your food contact surfaces and touching food, and then returning to the drain to deposit their eggs and in the process picking up things like listeria that can be growing in those drains and often

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those drains just fall in between the cracks. The kitchen staff may be doing a great job from the floor up, and no one is looking in those drains—so take a look at those floor drains. Take a look at your exterior doors for door sweeps. If you don't have a door sweep on that door and there is a gap under the door—for a mouse, there has to be a quarter of an inch diameter gap to get underneath that door. Particularly in the fall, when the weather gets a little cooler outside, heat is escaping through those gaps, and it's like a beacon calling those mice into the school for the winter, and causing us an energy problem as well. And then education, as Sherry mentioned, that's at the base of the pyramid and the biggest part of IPM.

The next slide. So IPM best practices. What are we talking about here? Well, the first thing we do when we come into a school to do an IPM implementation is doing an inspection and looking for those pest-friendly conditions like the lack of door sweeps, the dirty drain or waste handling—is the dumpster too close to the building, attracting flies and so forth to entryways? Are the dumpsters covered adequately? That really helps us to identify our priority issues to address in implementing the program. A key piece of IPM is ongoing monitoring as well. So using things like small sticky traps, which can help detect cockroaches and tell you what kind of cockroaches you might have and which direction they might be coming from, and how many, are really an essential part of an IPM program. And they need to be in those pest-vulnerable areas where food is stored, prepared and served. We need to start cleaning from a pest perspective, so if we're sweeping in a storeroom, and not going underneath the shelves, we are pushing food debris up against the wall. So take a look under those bottom shelves, and just a little bit of food debris can go a long way toward feeding cockroaches for a long time. Having an IPM coordinator designated is so important—somebody who can take charge of these day-to-day IPM activities and can be a point person when problems arise.

Next slide. It is really important to have a written IPM policy to state your commitment to IPM and says IPM is the way we are going to manage schools, and this is why and how we are going to do it. It's great to have a board-adopted policy to sustain your policy through budget cuts and personnel changes and other changes that can threaten your program if you don't have a strong policy in place. Inform everyone involved about the policy, and about their role; everyone has a role to play. It's not just the pest management professional who may be coming in on a periodic basis. Everyone in the school system, and we'll hear more about that later, has a role to play. It's really critical that only certified applicators apply pesticides. Often in schools, coaches or teachers, custodians, may be applying a pesticide without any training or education at all and often that's how misuse results in school closings or sicknesses arise. It's really important that you have that in your policy and then using the least hazardous options that are available to us; educating and communicating with everyone involved and evaluating our programs on a regular basis and rewarding those for a job well done.

Next slide. Finally, it's really important to have a solid documentation program in place so that we can see how we're doing and so that teachers and others have a way to effectively report their pest problems and get those to the right person who can respond and check off the list and provide a recommendation to keep the problem from reoccurring.

Next slide. I want to end with just introducing the National School IPM Effort that started in 2006 and is a very broad and growing national working group of over 200 people committed to implementing high level IPM in all of our schools by 2015. We are guided by a pest management strategic plan developed

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by about 40 professionals in 2006 that really steps out what needs to happen by 2015 to have IPM in place; it's also a great resource for how to manage pest problems when they come up in terms of identifying the least hazardous approaches to eliminate the reasons the pests are there and pesticide options when those methods are inadequate. So there is a link there, and you will have access to this PowerPoint afterward to go to that plan.

Next slide. There is an opportunity for everyone to get involved; it's a great listserv; it's a tremendous resource. You can get on and pose your questions and get answers from experts all around the country about problems that you're having. We also have a number of committees working on different tasks to implement IPM in all of our schools by 2015, and you are very welcome to participate in those.

The next slide. So here are some more resources that you can access through the PowerPoint after the webinar and then finally our acknowledgements are the next slide. Our national working group is made up of four regional groups, and the leaders and links to those working groups are listed here in the next slide. And thanks to our funders who have supported our work so far; it's been just tremendously rewarding to see the process everyone is making, and we really appreciate the financial support that's made that possible. And that's it for me; I really appreciate your time.

Michele Curreri:

Thank you so much. Now we are going to proceed with Gregg Smith's presentation. Take it away, Gregg.

Gregg Smith:

Welcome everybody. Before I begin to talk about cost and benefits, it's important to recognize that there will be challenges when trying to implement IPM. Dr. Greene touched on many of these, but bear with me, this slide will take a minute or two to get through. First, some of the challenges we have identified: motivating people is certainly key. IPM is primarily people management. Finding the right people and getting buy-in is the key to success. Next: training and education; effective IPM requires a certain level of understanding of pests, pest behavior and how to manage them. So training and education are very important. Okay, I'm going to start over with training and education. Effective IPM requires a certain level of understanding of pests, and pest behavior, and how to manage them. So training and education are obviously important. And training does not end after one session, you have to repeat training to maintain a minimum level of competency to keep up the data on new mitigation strategies and overcome the skeptics who have doubts. Facility aging condition: older facilities often have more pest challenges because of the building's design. Crawl spaces or pipe tunnels offer damp and dark and easy pathways to pass, and those facilities that have been neglected because of deferred maintenance will also have pest problems; for example, neglecting to repair the outside air damper in a unit ventilator is just an open door for pests.

Maintenance and operation: a building's condition is just often a reflection on the level of care that is expected and the challenges facing the custodial and maintenance staff. Sanitation and housekeeping: poor sanitation practices in the kitchen and food storage and trash holding areas allow grease, grime, and waste to accumulate, which creates harboring opportunities for pests. Poor sanitation is likely the number one reason for pest problems as Dr. Green mentioned.

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Poor housekeeping practices create shelter opportunities for pests. By housekeeping we mean those mounds of clutter found in classrooms, offices, stages, storage areas, custodial closets and every other conceivable place. Poor or lax housekeeping is likely the number two reason for pest problems. Some possible reasons for sanitation and housekeeping problems—occupants' lack of understanding about what attracts pests and lack of cooperation between departments. Also, custodians with limited opportunity to remove food or clutter or to reinforce better housekeeping standards. Finally, older buildings that have had a longer time for problems to develop.

Maintenance and custodial budgets: these are challenges because the greater these budgets are cut to a minimum; they just create more and more challenges. For example, capital repair/replacement costs increase dramatically the longer they're deferred. Indoor air quality problems increase because of broken or neglected mechanical systems. Energy conservation opportunities are ignored or become cost prohibitive. Sanitation becomes marginal, causing pest and other issues. Occupant morale suffers because of dismal conditions. Trying to implement IPM in the face of decades of differed maintenance will likely be costly. So maintenance and custodial budgets must be appropriate for the level of care expected by your school district.

Organizational structure: a school district's source of organization structure can impact the likelihood that IPM will succeed. What we have observed is that if a principal is responsible for hiring and directing the work of custodians, including when and where to clean, ordering supplies, setting priorities, then every principal in the district would have to understand and embrace IPM in order for the program to succeed. Conversely, if custodians are hired, trained and supervised by a central custodial department, even though they would report to a principal on a daily basis, then the chances of a successful IPM program are increased.

One of the final challenges is geography, but unfortunately we have no control over this issue because every area of the country is going to have different and unique pest problems and pressures. Okay, so I'm going to start talking about cost benefits, but first we need to talk about pest management practices.

There are many ways to approach pest management including no restrictions at all on pesticide use, school personnel applying pesticides, contracted pest management, a combined effort of in-house and contracted pest management, and then finally, integrated pest management. Before IPM, our district would have fit into the fourth category. We applied herbicides to our grounds, but contracted for all of our pest management services. Next slide.

Under the traditional pest management contracted model, Salt Lake City District relied on contracted pest management services for as long as anyone could remember; that's over 30+ years. In fiscal year '08, our contracted pest management services amounted to less than one half of one percent of our custodial budget and only two-tenths of one percent of our total facilities M&O budget. What is worth noting here is that pest management was never a significant expenditure compared to the entire budget. It's easy to see why pest management does not receive a lot of scrutiny or attention. Next slide.

So as we transitioned to an IPM pest management approach, obviously we were cognoscente that there would be costs. Those costs would be both personnel and material costs, so I'm going to talk about each aspect of these costs in detail in the next few slides. Next slide.

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IPM training and education. Training, whether it involves asbestos, OSHA, cleaning methods, emergency response, or IPM, is an absolute requirement in today's work environment. IPM also requires training and ongoing education not only for the practitioners, but also for newly hired personnel, principals, teachers, kitchen managers, maintenance staff and other staff as well. And with other training, IPM education only takes time away from our personnel's daily assignments. We did not hire any new personnel to implement IPM; we just trained our existing staff and other personnel in new ways to deal with pests. Next slide.

Monitoring and reporting: there's an adage that says you can't manage if you don't measure, and that also includes pests. Monitoring traps, or sticky traps, are the basic IPM tool we use to diagnose new and developing problems. And we do this routinely. Our head custodians are required to perform routine building inspections twice a week for many reasons—cleanliness, garbage clean-up, those sorts of things—but also with IPM, they check monitoring traps at the same time they conduct their inspections. And if they see pest issues, they check their traps more frequently, and they are trained to evaluate what they see in the traps and set new ones as needed. Next slide.

There are some tools of the trade that everyone should have to start out with IPM. To help our three coordinators to do their jobs more effectively, we purchased some basic tools of the trade. They use these tools for inspection, identification and diagnostic purposes and occasionally they do some minor exclusion work such as caulking small openings. The number one tool is a UV flashlight; it's an amazing tool. Next slide.

Diagnostic tools: this was our biggest expense, but we felt they were important. We also purchased a stereomicroscope, and you may be able to find one of these from a biology lab you can borrow. And that allows our IPM coordinators to assist them with pest identification. Now they'll never be entomologists, but they can tell six legs from eight. If you can afford it, get them a microscope with a built-in digital camera. It adds a few bucks, but those pictures are just invaluable for including in reports, training materials and newsletters. It also helps to have a good collection of reference resources. The greater our staff's and coordinators' understanding of habitat, diet, reproduction, the better they are at understanding and controlling pests in a school environment. It's worth noting too that the EPA's website has numerous IPM-related resources available for free as well. Next slide.

Professional Development: we felt our custodial supervisors and ground staff must have a greater understanding and knowledge of pesticides even though there seldom is a need to use them to control pests. We do occasionally use herbicides to control weeds on our land on an as-needed basis, and under current Utah law, anyone could apply a pesticide under law. It's not restricted, but we do ask our staff to become licensed applicators anyway as part of professional development and to enhance our program, and this turned out to be a very low cost investment in dollars. And the only thing we did spend is the time needed to prepare for the license, exams and licenses. Next slide.

Exclusion: exclusion problems are likely to be an ongoing expense. This probably never ends, but it certainly should diminish in time. How much of a problem is dependent upon a lot of factors, but probably the most significant is the age and condition of your buildings. The obvious pest entrances are relatively easy to spot, and once they have been addressed, these spots will diminish over time. What

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we have seen is many facilities folks think they are going to be spending fortunes on exclusion, and we found this not to be the case, and there are reasons why and we'll get into that in just a minute. Next slide.

Other IPM tools: insecticides and herbicides are also tools in the IPM toolkit. We have found that insecticides are seldom needed to control pest problems because other IPM practices will generally solve the problem first. However, if an infestation cannot be controlled, we will apply pesticides but only through one of our licensed applicators (in-house licensed applicators). Since 2006, the public school district has applied insecticides only 10 times in small quantities and only in targeted locations in our schools. When necessary, we use snap traps to control mice, and herbicides as I mentioned are sometimes needed to reduce weed populations that have exceeded our threshold or to rehabilitate damage of worn turf. Regardless of the pest problem, our practice is to explore and implement all possible solutions before finally having to use pesticides in our buildings and on our grounds. Next slide.

Now, perspectives on IPM costs. There are many ways to interpret a balance sheet, and it's really a matter of defining what are the real costs. This is from my perspective, IPM costs can be summarized in these three statements. And the first is, "is the cost to repair something because of a new program really a new cost, if it should have been repaired for other reasons?" I believe no. Attributing the cost for example, of repairing a window screen that had been ripped for many years and calling that cost a pest exclusion is really not accurate. That screen should have been repaired as part of a normal building maintenance. "Should new activities that replace or enhance existing activities be considered a new cost?" Not really. If a supervisor is responsible for ensuring a level of cleanliness and he or she does this by performing walkthrough inspections then adding a few new inspection tasks such as checking our monitors does not create additional costs. Likewise, it's my belief that few districts if any can legitimately claim their personnel are so tightly scheduled that they cannot find an extra 10 minutes a day to check a monitor or to report on pest problems. And finally, "is the time required to increase staff awareness create an atmosphere of cooperation and improve the environment and foster sustainability really a cost?" Again, and it's my opinion, not really. You're already really paying for the time with your personnel, so why not use some of their time to enhance your district and make it safe and healthy and green and responsible place for parents to send their kids? Next slide.

In summarizing IPM costs, you can see we had some initial start-up costs, and we have some ongoing, repetitive costs that we would see year after year. IPM certainly has added some new responsibilities, assignments, or tasks to our supervisors, and to a lesser degree, to our staff, such as our custodian and maintenance personnel. However, the consensus is that no one really feels burdened by the assignments and especially because we believe in our objective. Yes, we are spending less on pest management than we have in the past, but that was never our goal. Next slide.

So the benefits: you noticed in one of the earlier slides we spent \$28,000 a year on pest management. We finally terminated that contract, and we are doing everything in house. Our in-house costs are certainly less than what we were spending with contracted pest management. I'm confident that any district that spent less on pest management by adopting IPM; for some districts IPM might cost more initially than their current practices. But for most districts, IPM will just be a change in how to conduct business and spending the same dollars, just differently. Often resistance is based on some unrealistic perceptions of actual costs or a lack of understanding in how to proceed with implementation. For our

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district there was simply no need to justify IPM on a cost-benefit basis when the associated costs were really insignificant and the benefits were perceived as so important. The real benefits of IPM are the health benefits, and we can't put a number on the value of those benefits. IPM has reduced our compliance issues with OSHA, the health department, risk management and others, but we haven't attempted to fix the value on these benefits either. Integrated pest management helps to reinforce the perception that our department and our custodial and maintenance personnel are stewards of the environment, not just the cleaning personnel and repairmen. And the public relations benefit of IPM for our district has been absolutely priceless. Thank you, and I appreciate your attending the web seminar.

Michele Curreri:

Thank you so much, Gregg; and our final speaker today is Bob Stoddard. Take it away, Bob.

Bob Stoddard:

Thank you, and I'm thanking all of you for giving me the opportunity to share my view on this issue. If I could go to the next slide please.

I just wanted to talk a little bit about the philosophy of: if you're going to contract this out, I think it's important to understand the philosophy of the person you're going to hire or the company you are going to hire. We've adopted a "use pesticides as a last resort" philosophy. I think if you don't have that philosophy; it's just so easy to fall back on the band-aid of pesticides. We also have decided on specific pesticides we will not use, in fact, haven't used them since 1993. Although I do want to put a little bit of an asterisk on this one, is that some of these may be needed in some of the regions where there is more pest pressure than there is in Michigan, but whether they are carbonates, organophosphates and synthetic pyrethroids, and our opinion is some of these may be more risk than the pest you're trying to manage. We also feel that a school district should really have a pest program that covers all the pests that you may potentially face including head lice, wood-destroying insects, and stinging insects, and again there is a reason why I asked for an asterisk there is because the termite pressure in Michigan is way different than it is in the south, so that may not be something that you're going to get a contractor to include in your contract, but in Michigan we find we can do it. And one of our biggest philosophies is we really do look at all our clients as partners and colleagues. If you do not have a partnership with your pest management professional, in my opinion, you're not doing IPM because your staff, you, have half the interaction with them. And then lastly, I think it's important that the company you choose to hire to do your school has proven that they're really interested in doing true IPM. And one of the ways we've been able to prove that is by having our company be GreenShield certified for all of our services. Next slide.

So there are really three main areas of this domain. People have talked about education and communication, and I'm going to share with you a little bit about how we do that. I think leadership is important, and I think having a least-to non-toxic toolkit is important. Next slide.

When we start a new district, we actually go out with two people to every one of the district's buildings, and we do an outside inspection; we do an inside inspection; and more importantly, we actually sit down with the building manager of that district or that building and we talk to them about the history of the building and what the historical pest problems have been. Because we understand that your custodial or maintenance person is going to know that building far better than any, any pest

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management professional is ever going to know it. They're there every day, and they have ownership of that building. We also feel that it is really important that a pest management professional, if they're going to do schools, they need to train the school staff on what to look for and what they can do to help prevent pests, because they are there every day and we need to use that tool. Each of our buildings has an IPM manual, and by manual, I mean literally an educational book. It's not the typical carbon-sheet collecting manual; it's not a record-keeping tool, although that's a facet of it, but there's actually educational factsheets in there that let teachers, parents, custodial staffs learn more about the pests they may have in the building, as well as at their homes. We continually each month send out a new factsheet about up-coming pests, so we're always making them aware of what we see as coming in the near future. And then, as in any good program, we know that after you get going a while, sometimes people just get complacent. And we feel it's really important that on an occasional basis there is some type of refresher in-service just to make sure that everyone is still on the same page, everybody understands the logs and their roles in the pest management program. But one of the biggest tenets that I think you have to have when you're doing true IPM is a detailed written report. You know, the carbon sheet that is left on the custodial office desk, it may have a lot of great information in it, but it may never get up the chain of command to the person who decides that the door sweep needs to be fixed or that, there, the cleaning isn't right. So we really stress that all our reports are written, all our findings are written, and they go to the director of operations. Next slide.

We have a little different philosophy with our districts and our monthly visit. We actually don't go to every building every month. We're not the bug guy that shows up every third Monday. We show up every third Monday, but we actually meet with the facilities director who hired us. And then we actually go to the specific problem buildings. Remember, we've done our educational piece with their staff so they know what they're looking for. And don't you really want the professional you've hired to spend their time working on the problems, not going to buildings that have no problems? In Michigan, we're required by law to give pre-notification to parents in event of a pesticide implication. We feel that we actually handle that, we feel that it is important that we handle it. We're the contractor. We know what we're applying, we know where it's being applied, we know what we're using, and we relieve that burden from our districts. I just think it's something pest management professionals should do for a school district. And then, we can have regular scheduled contact with the staff, but we also are available, say, if we aren't in the district, to come back, at no extra charge, and take your problems as they arise. We further make ourselves available via our cell phone, email, website, and not only just to school staff, but to the community to help them understand this thing called IPM. Next slide.

I mentioned a toolkit. And our toolkit is way bigger than this, but that would be a whole other seminar. But one of the things that's unique that we do is we actually provide to our districts a non-toxic head lice shampoo called De-Licer. And if you want more information on that, you can go to de-licer.com. It's been a great benefit for our district. We do not use any liquid or aerosol applications. I just feel there is a lot of potential, for risks to the users of your facilities, and I have not used them since 1993. And I know traps were mentioned; we actually don't use the typical blunder trap. We use very species-specific traps, and we use pheromones that are specific to the pests we are trying to monitor. And those are very effective. And of course we use baits and gels. Next slide.

Well, some of the problems I've seen over the years is that schools are well-intended and they want to comply with your state law, they want to do IPM. So, they hire a contractor. And I won't call these

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people pest management professionals. They're licensed, and they claim to do IPM, but what they're doing is really pesticides monthly. They show up, and they spray. They see a bug and they spray a bug. That is not IPM. And it's not really the school's fault, because they're licensed. I know Tom talked about pesticide policy—you have to have a pesticide policy and it needs to be in your administrative manual. I know from my school experience that that administrative manual was our Bible; it was what we—we ran our district with that book. You need a written policy. Another thing I see schools doing all the time is they write an RFP for pest management. Sometimes one that is 20 years old. It's the same one they've used every two or three years. Or it may be a new one, and it's just too weak. The IPM plan can only be as good as the RFP you write. You have to be specific because you really want to weed out those folks who are not really doing IPM. And then, this is getting better, over the years I've been around schools, more and more schools have gotten away from that low-bid mentality. But it does still happen that the school writes an RFP, we get a bunch of very comparable bids and then there is that one really low bid and it goes to the board, and the board chooses that one, ignoring everything they specified. So, it's really important to have a strong RFP. Having a blanket purchase order with your pest management professional can be a potential problem because what I've seen in districts that do that is we get boosters calling into the pest management guy, we get kitchen staff, we get volunteers so operations has no idea that there's even a service being provided and may not without any notification and stuff, may not be getting that done. And that all leads to having a central point of contact with the district's operations office—crucial. And then so many programs do nothing about head lice. I think many of you on this call know that's a huge problem for us. Next slide.

So, what are some good practices? First of all, I would definitely suggest you hire a contractor who has been Green Shield certified or at the very least has gone a step further and has some other certification where someone has looked at their business practices and looked at the products they use. Now this one should be in your IPM policy, you should clearly state who can purchase; who can use a pesticide; what pesticides can be used; as well as where, how and when they can be used. Having that blanket PO at the local hardware store for any maintenance guy, any HVAC guy, and custodian, can go in, buy whatever they want, and then bring it back to school. That is really a recipe for disaster. Because some of the stuff in those hardware stores isn't even labeled for school use. And then another part of that policy that I would have is that no pesticide may be applied in the district without the approval of the IPM coordinator or the designated staff from the Operations Department. It's crucial. You need to know who is applying pesticides. Now, this is often overlooked in districts where you are building this brand new high school or putting on this brand new addition, and no one ever thinks to have your pest management professional look at your plans or do a walkthrough. We've done so many walkthroughs on new buildings that everyone thinks are going to be pest-free and we find door sweeps that aren't installed right. We find doors just by construction that don't seal right. We find landscape designs that are very conducive to pests. So if you can have your pest management professional review plans before it is built, you may save yourself a lot of long-term headaches. And I cannot stress how important it is for your pest management professional to do in-services for your staff. They need to know what they're looking for and how they can help. And then, a new thing that is really going on now and is everywhere is tracking maintenance with computer. I know school dudes out there, I know Gregg's got his own in-house thing and that's a great thing, but I think we need to add a step in there where we actually put IPM in our maintenance programs and really look at our maintenance from a pest management perspective. And I think that's all I have time for right now. Thank you.

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Michele Curreri:

Great, thank you so much. We're going to go ahead now and continue on, and give everyone an opportunity. We've got a couple of great questions, actually many great questions, and we're going to give our experts a chance to answer those now. So our first question is for Dr. Green. Does health data exist regarding pesticide exposure in children?

Dr. Tom Green:

Yes, there are reams of studies showing pesticide application and associations with various effects, health effects, on children and adults. And a number of those are referenced in the school IPM plan.

Michele Curreri:

Great, thank you. And Dr. Green, one more question. Could you speak a little more on one of your slides you talked about the studies that show that IPM is achieving 70 percent reduction in pest complaints in areas where pests are more common, specifically in urban areas. Could you speak about those studies?

Dr. Tom Green:

Sure. These particular numbers are coming from a study that was published by Dr. Dawn Gouge and collaborators, back in 2006 I believe. It's also referenced in the school strategic plan with the link to it there. And it's documented the results from 10 pilots in mostly urban school systems where these school systems adopted IPM, much like what's been described here with initial flight assessments and prioritization of improvements that are needed, and really extensive documentation of how many pest complaints occurred over the time period that the project was being implemented and how many pesticide applications were made. And so those were counted up and compared at the end of the project versus the beginning. And those reductions were documented, again by doing the things we were talking about today—doing that long-term prevention, for example.

Michele Curreri:

Great, thank you so much. We have a few other people that are on the line that didn't give presentations but are available to answer questions. So this question is for Mark from Iowa State University. It's a little bit of a detailed question so we also received this question prior to the webinar, but their school district, they have four schools, and they are surrounded by a large apple orchard. The school district question is about pesticide application drift or chemical applicants leaching from the orchard onto the playgrounds and ballfields. The orchard owner is very responsible, and he has licensed employees applying the pesticides, and herbicides, and fungicides. So the question is, are the children safe from these pesticides? Could there be drift or leaching? How concerned should the school district be, and what action should be taken? And do they need to test the soil and the ground water?

Matt Shour:

Well that's a very good question, and it's kind of hard to answer it exactly because we don't know the distance between the school and the orchard, but the bottom line is yes, there is probably drift going from the orchard to the schools. Some of it may be minimal; hopefully the applicators are applying when conditions will favor any drift moving away from the school instead of toward the school. Leaching in the soil is a possibility; it probably is more remote than would be the aerial drift either during the application or volatilization after the application has occurred. But, I think the school should sit down with the orchard organizer and the manager and just express concern about the pesticide drift potential

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to their children and to their staff there. And request them to sit down with a university personnel and go over IPM techniques and how they could be implemented in that orchard and to minimize the pesticide use that would be needed in that facility, as well as notifying the school facility about when the pesticides are going to be used. Hopefully, there will be a coordination that when pesticides are being used they can be done on a weekend when there are no children around.

Michele Curreri:

Thank you so much. Okay, our next question is for Tim Stock from Oregon State University. And it actually comes from Florida. Florida has seen some of its IPM school programs revert quickly back to poor status. How important is the role played by the IPM coordinator in school IPM programs?

Tim Stock:

What was the, back to poor status—poor as in not very good status?

Michele Curreri:

Yes, that is what the question said.

Tim Stock:

And what is the role? Could you just repeat the question again just to make sure?

Michele Curreri:

It's from a person in Florida, and they've seen that some of their IPM programs revert quickly back to poor status. I'm not sure what they meant by that, but that's what the question said. Then their second part of the question is, how important is the role played by the IPM coordinator in school IPM programs?

Tim Stock:

I'd say it is the most crucial role of all. The IPM coordinator should be getting training every year to keep his skills up. There should be a policy, as was mentioned previously, that includes the coordinator providing communication and training to the school staff, especially custodial staff. Custodial staff needs to be trained by the coordinator or in Bob's case, by an external contractor on pest-conducive conditions and that kind of thing.

Michele Curreri:

Okay, thank you so much. And then our next question is for Bob Stoddard, and it's about lice. It's a two-part question. So the first part is, is De-Licer EPA registered or is it Section 24-B exempt? And the second part of that question is—I'm sorry, I just lost it. Well, Bob, if you could answer that first part of the question, I'll find the second part. I'm sorry about that.

Bob Stoddard:

De-Licer would not be an EPA registered product. EPA actually does not register head lice products. The FDA hands that, and it is an FDA registered medical device; it is used as a nit removal tool. The enzymes in it actually dissolve the glue that allows it to attach the nit to the hair shaft. And it's been very successful in our school programs.

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Michele Curreri:

Okay, and then the second part is, and we've gotten this type of question from several people, and it is again about lice. And, in short of not allowing children with confirmed cases of head lice to be in the school, what is done to control head lice outbreaks in school? So it's sort of a general question about what they should do.

Bob Stoddard:

Well, our program at our schools has been one we do, we have thorough vacuuming; we recommend that no bedding spraying or furniture spraying be done, because those have proven to be ineffective. And we do, we actually, our part is that we come in and do a survey of the room and we make recommendations like upholstered furniture, fuzzy balls, no hat sharing. And if it's really severe, we have actually had it where each student, especially at the elementary level, is given their own cubby, Rubbermaid container, and their things are put in it. And things, because a lot of time elementary schools are set up where hats and things are very close together. We tend to see this one our seasonal breaks at school here in Michigan when it's that really has helped us a lot. We just keep their stuff separate; we don't do dress-up; we don't do hat sharing, and it's a really thorough cleaning and consistent cleaning and vacuuming of the room.

Michele Curreri:

Great, thank you so much. Thank you to all of our speakers. We're going to switch right now. I apologize we had a polling question earlier before our speakers got started, but we got pulled off. So we're going to go ahead and do two polling questions. So we hope that you'll stick with us. So our next polling question is, how often does your school conduct pest management inspections? Monthly? Every six months? Yearly? Only when necessary? And Never? This is what you're doing now, polls are open. Okay, we're going to go ahead and close polling. Oh, very interesting. About 42 percent of you guys do monthly inspection. About a little less than that, 37 percent of you do it only when necessary. So now our last polling question will be interesting to see how things changed. So, after participating in this webinar, how confident do you feel in your school's approaches to pest prevention? And polls are open. Great, we're going to go ahead and close our polls. Oh, interesting, thank you so much everyone for participating in this poll. About 36 percent of you are more aware, but anxious to learn more. And we're hoping that this webinar has helped. Twenty-seven percent are very excited to try the strategies and information you learned here at the webinar back in your own districts.

So now we're going to talk about some resources that are available. Here is a list of some fantastic websites that are available for school IPM. And just to remind everyone, these slides will be sent out to all of you who participated in today's call with these resources, and they'll also be available on our website later on. So you don't need to worry about writing everything down. And we're going to go on to the next slide. And here are some *Indoor Air Quality Tools for Schools* resources that are available. I suggest that the first place to start is our EPA *Indoor Air Quality Tools for Schools* website. If you're interested in learning more about our *IAQ Tools for Schools* electronic update and newsletter, which brings you great information on hot topics, emerging research, and best practices to your Inbox, you can subscribe using the directions we have here. We plan on at the end of June sending out an electronic update on integrated pest management, and we'll be using a lot of the information we got from here and even more information. We encourage you to join our *Schools IAQ Connector* Listserv; it's a great place. It allows you to connect directly to your peers. We've got hundreds, thousands of schools that

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are on this network so you can go ahead and throw your question out there and you'll get your answer back from your peers. So again, here's the information on how to join the listserv. And the resources from today's presentation, the slides, and from our previous webinars if you'd like to download those, there's a website where you can get that information. And then here's a few more IPM in schools resources. The checklist that is part of the *Indoor Air Quality Tools for Schools* Action Kit and the IPM for Schools How-To Manual.

Well, that's all we have for today, we thank you so much for your participation. If your question was not answered today, please check back on EPA's webinar resource page or look for the email that we'll be sending out in a few weeks with our whole list of all of questions and all the answers that we received today. A special thank you to all of our speakers for the fabulous information that I'm sure will be of great help and assistance to all of our participants. And a very special thank you to Sherry Glick for all of your hard work in pulling this webinar together; we appreciate our speakers' time and attention to this very important topic. And thank you to our attendees for attending today's webinar. Have a nice day.